

## Non-Technical Summary

### Report Background

The Royal Society for the Protection of Birds (RSPB) is proposing to undertake a national 'flagship' coastal habitat creation project on Wallasea Island at the junction of the Crouch and Roach Estuaries (Essex). This 'Wallasea Island Wild Coast Project' will return the bulk of the Island to a diverse range of dynamic intertidal habitats, with extensive transition zones, that will be rich in birds, fish and invertebrates. It will be a coastal habitat restoration project on a scale that is unique in the UK. The creation of new intertidal mudflat, saltmarsh and transitional habitats is designed to contribute towards UK Biodiversity Action Plan (BAP) targets and also help mitigate for the losses of these habitats elsewhere in Essex where they are under increasing threat due to the effects of climate change and sea level rise. In addition to the habitat and nature conservation benefits, it is also intended that the project will increase understanding of the coastal environment and its management and will compliment the existing Defra managed realignment site (a 115ha scheme which was implemented on the north shore of Wallasea Island in 2006). The creation of a multi-functional nature conservation, recreational and educational resource is therefore envisaged. The RSPB is confident the project will be an inspiring example of how the impacts of climate-induced sea level rise can be managed to minimise secondary impacts, while working with estuary processes.

To support the Planning Application for this proposal, and also to underpin applications for other relevant legal consents/licences for this proposal, the RSPB commissioned ABP Marine Environmental Research Ltd (ABPmer) to conduct an Environmental Impact Assessment (EIA) as required under the Town and Country Planning Act (EIA) Regulations 1999. As a first stage in the EIA process a Scoping Study was carried out to highlight the key issues to be considered in detail within the assessment. This Scoping Study was informed by the results of a series of initial consultations with council officers and key stakeholders, as well as findings from an extensive public consultation exercise that was undertaken by the RSPB. The Scoping Report (ABPmer, 2008b) was then fully circulated by Essex County Council who issued a formal Scoping Opinion on the 5<sup>th</sup> of November 2008. In accordance with the agreed scope set out in this, and also taking into account the views from a range of other consultees, this report now presents the resulting Environmental Statement (ES).

### Project Description

To achieve the proposed 'Wallasea Island Wild Coast Project', the RSPB has been working closely with the current landowners, Wallasea Farms Ltd., and has secured agreement to purchase approximately 736ha of mostly arable farmland on the Island.

## Project Need and Rationale

There are several motives for, and benefits of, this proposed project and they include socio-economic and educational objectives. However, the two central aims are to offset historical losses of coastal habitats on this island and across the rest of Essex while also addressing the flood protection risks at Wallasea. It has also been designed to act as a major contribution by the RSPB to adapting to climate change on the coast. The application area of Wallasea Island is considered an ideal site for such a project because it is a large area of low-lying, former intertidal land that is entirely within the coastal flood plain and where there is no pre-existing infrastructure.

With regards to the ecological need for this proposed project, coastal habitats are of considerable importance to birds and other wildlife, as they provide feeding, roosting and breeding areas for birds and support a wide range of fish and invertebrate species. For example, over two million wildfowl and wading birds are supported by English and Welsh intertidal habitats each winter, and more pass through during spring and autumn migration. Consequently the conservation of these habitats is a high priority for the RSPB, and the Society actively supports achievement of the UK BAP targets for coastal saltmarsh, mudflat and saline lagoons. These habitats are currently assessed as being lost at a rate of 600ha per year combined, mainly due to rising sea levels and climate change. Benefits of the restoration of such habitats extend beyond the obvious wildlife gains to include a reduction in flood management risks, improved water quality and the potential to act as carbon soaks. The design will furthermore include supralittoral habitats (above high water) that water can eventually 'move into' as sea levels rise thus ensuring that the site will be sustainable over the long-term. With respect to existing habitats both on and adjacent to Wallasea Island, mitigation habitat creation was an integral part of the scheme design to help offset impacts to protected species and habitats.

An important consideration for the proposed Wallasea Island Wild Coast project was to ensure that it is in keeping with, and facilitates, the medium to long-term flood management requirements for the adjacent estuary and, particularly, that it is in line with the Environment Agency's Flood Management Strategy (Halcrow, 2006). In this context it is important to note that this strategy recommends managed realignment as the long-term flood management policy for the majority of Wallasea Island, subject to economic viability and further assessment. Managed realignment can be defined as 'the deliberate breaching, or removal, of existing seawalls, embankments or dikes in order to allow the waters of adjacent coasts, estuaries or rivers to inundate the land behind'. The Strategy highlights that, without intervention, natural breaching could lead to significant flooding of the Island and adverse impacts on the hydrodynamics of the estuary and increased stress on the existing estuary defences. There is a genuine risk of such natural breaching occurring in the short to medium-term as approximately 5% of the seawalls around the proposed RSPB site have less than 10 years of residual life, and as most of the Island's clay embankments are in a relatively poor condition. Furthermore, the height of the majority of the seawalls is such that there is a high (20%) annual probability of the lower stretches being overtopped/breached during storm surges (also expressed as '1 in 5' years).

As the Island is not compartmentalised, and as it is universally flat and low-lying (with the average elevation being 1.35m below the level of Mean High Water) overtopping/breaching along such a 'weak link' would affect the whole Island, and could lead to it filling up, as was the case during the 1953 floods. If natural breaching (or 'unmanaged realignment') of the Island's defences were to occur, a large amount of additional water (11Mm<sup>3</sup>) would be introduced to the Roach/Crouch estuary system. Both Halcrow (2006) and modelling undertaken for the purpose of this EIA have concluded that this would have substantial adverse effects on the estuary system, including potentially major impacts on the oyster lays in Paglesham Creek to the west of Wallasea Island. The same modelling determined that a considerably lower volume of an additional 2-3Mm<sup>3</sup> could be accommodated by the estuary without having a significant adverse impact on the geomorphological or ecological functioning of the area. The RSPB is consequently proposing to implement a design whereby 2Mm<sup>3</sup> will enter and leave the site (and thus the estuary) on higher (i.e. 'spring') tides. This amount of water exchange will facilitate the creation of a wetland that replicates natural tidal cycles. The proposed scheme would also help improve the defence protection levels for the buildings on the west of the Island, as it would involve the construction of a new counterwall built to higher protection levels; this would furthermore significantly shorten the line of defence and long-term seawall maintenance costs for the Island would thus be reduced. To, amongst others, allow for flexibility and design improvements as well as to limit design risks, the scheme is partitioned into five 'cells' or compartments which will be implemented in stages/phases. One of these Cells (Cell 3, see below) has the potential to act as a flood storage area that could help to reduce flood risk across the estuary system, especially on the largest surge tides.

The scheme was furthermore designed with socio-economic issues in mind. Firstly, the Wallasea Island Wild Coast project is thought to lead to beneficial effects on the local economy through direct job creation; it has been estimated that it would create a (net) 16 to 21 Full-Time Equivalent jobs over the next 10 years (Eftec, 2008). Secondly, it is also thought that the scheme will safeguard around 10 shellfisheries jobs as it will offset the risks from an unmanaged breach, and as it has been shaped to ensure that the majority of the flow exchange takes place in the outer Roach and away from the main shellfish beds. For the same reason breaches have not been placed in Paglesham Creek to ensure that there are no significant flow changes within this important area for oyster beds. Existing electricity infrastructure will be moved to an alignment where it will be accessible for the long term. Recreational opportunities will be improved both for bird watching and the general community, as the new nature reserve has been designed with many stakeholders in mind (and in consultation with such stakeholders and the public). For example, there will be an extensive permissive footpath network, cycling and wheelchair routes, a dog walking area, bird watching hides and a landing beach for sea kayaks. Existing rod angling activity on the Island will largely remain unaffected, wildfowling adjacent to the project land will continue at least to the end of construction, and ferry access from Burnham on Crouch will likely be improved.

## Scheme Design

Based on the results of a detailed review and consultation process, and after several scheme revisions, a final design has been adopted, underpinned by detailed hydrodynamic modelling. To achieve the coastal habitat creation, the site will be divided into five separate cells as described above that will be divided by internal bunds (which, where practicable, will be aligned to follow old marsh 'island' boundaries). To allow for development of a varied mosaic of saline and brackish habitats, three of the five cells will be subject to full realignment and one cell will be a Regulated Tidal Exchange (RTE) area. RTE is similar to managed realignment, but rather than breaching a seawall, it includes the insertion of water control structures such as weirs, culverts or sluice-controlled pipes into seawalls to control (more or less) regular tidal inundation (this technique particularly lends itself to saline lagoon creation). For the most part, the fifth cell will contain mitigation habitats and visitor access facilities. Excluding structures, overall, some 133ha of mudflat, 276ha of saltmarsh, 53ha of saline lagoons, 11ha of brackish marsh, 160ha of grassland (incl. coastal grazing marsh and seawall) and 15ha of rotational arable fields (termed 'wild bird cover') will be created.

The project will involve the importation of quality controlled inert fill materials by ship to facilitate creating a suitable landform in the three realignment cells (Cells 1, 2 and 4). The landscaped raising of land levels will mean that when the tidal waters are allowed in, the volume will be much less (2.1Mm<sup>3</sup>) than in an unmanaged scenario and this will avoid the aforementioned adverse environmental impacts associated with the non-intervention approach. The fill will include a range of inert recovered materials (including possible dredge arisings); a main material source will be the beneficial reuse of recovered tunnelled material from the London Crossrail project. Crossrail consider the relocation by sea and re-use of the recovered materials for the RSPB project to be the most appropriate and sustainable solution for the use of its materials. These will mainly be comprised of relict estuarine mixed sediments and marine deposits (which are eminently suitable for the creation of intertidal habitats). To achieve the currently estimated requirements for a tidal water exchange of around 2Mm<sup>3</sup>, a total of 7.5Mm<sup>3</sup> of imported fill material will be needed.

The recovered inert material will be used to create shallow sloping profiles throughout Cells 1, 2 and 4 (the realignment cells); there will be a gradual transition from the channels which will guide the water into the Cells, to the internal bunds and seawalls. Internal bunds will be constructed mainly with material sourced from the re-profiling of the site, as well as channel and lagoon excavation works. Six 100m wide breaches will be excavated through the existing seawall, and channels dug to their landward and seaward sides to facilitate water exchange. On site, a network of sinuous creeks will be cut into saltmarsh areas, and selected creeks will conduct water into 'high level' lagoons excavated from elevations associated with upper/transitional saltmarsh. Cell 3, the RTE cell, will not receive recovered material, but will be subject to reprofiling to excavate a large shallow lagoon, and create slopes up to the internal bunds.

## Construction Methods

A recovered inert fill management plan has been developed to describe the methods to be employed to transport the material to the Island as well as to quality control the materials. With respect to the Crossrail material, this will be transported from London to Wallasea using ships or barges on a 24h day/7days per week basis, dependent on the tides. The material will be unloaded at a purpose built unloading facility, which will be a temporary floating or fixed unloading facility on the north shore of Wallasea to the west of Ringwood Point. This will be big enough to accommodate both two ships at any one time, as well as an appropriate amount unloading plant. From the unloading facility, the non-chalk majority of the material would be placed onto a conveyor and then transported either to a direct placement location (within a 4km radius) or to a temporary storage area to landward of the existing seawall (no further than the latter at night). Wet chalk and potential dredge arisings would be pumped onto site using pipelines, where the material would be contained (and slowly dewatered) in basins surrounded by low bunds. At maximum output, six operatives will oversee unloading operations. To create a stable and elevated platform which can facilitate access to the unloading facility and provide an even and elevated route for the conveyor and pipeline, an intertidal channel within the Defra site will need to be temporarily infilled (footprint of 0.8ha of the Defra site); the baseline topography will be reinstated post-implementation. The fill material to be imported to the site will be checked for agreed quality criteria with Cefas, and a Food and Environmental Protection Act licence will be acquired for all materials.

With regards to on-site earthworks and landscaping, the basic processes were described above, but with respect to construction plant, materials will be taken from the conveyors or the stockpile area and either landscaped by dozer or loaded to dump trucks, transported on site and landscaped by dozer, depending on material type, weather and ground conditions. A roller will be used to compact structural parts of the wetlands e.g. Cell division walls. Apart from this, compaction is not required on any fill material that is to form the new wetland. Breaching works will be subject to tidal limitations, working schedules and safety restrictions and will follow the tried and tested practices and safe working arrangements adopted for the Defra site breaching.

The construction programme for this managed realignment will be influenced by the timing of the fill material delivery from the Crossrail project and other suppliers. Therefore, a window of time has been identified for the completion of the project and it is scheduled for completion by 2016 at earliest or 2019 at latest. Within this timeframe, the Cells will be implemented in a phased manner, the construction of Cell 1 is anticipated by 2012 (following fill delivery commencement in Summer 2010), and a gap of at least 2 years is expected between the breaching of Cells 1 and 2. Mitigation habitats in Cell 5 will be implemented as necessary, with a small 2ha water vole mitigation area being constructed very early on (with a phased annual expansion to 6ha).

These works will typically be carried out by one Principal Contractor, who will likely locate temporary site offices and facilities in each Cell. Risk Assessment requirements for all of the work as well as the individual health and safety considerations to which the preferred Contractor will be subject to have been determined.

## Site Management

The management of the site during the construction period will be overseen by the RSPB, who will be responsible for the management of construction works and the environmental monitoring of the site.

During the operational phase, the habitats on site will be managed according to a site management plan, and progress towards achieving the sites' objectives will be reported on each year in the form of an annual report. The water levels in the coastal grazing marsh and lagoons will be monitored and adjusted/manipulated if necessary. Grassland and upper saltmarsh will be grazed in summer and autumn to provide suitable habitat for a range of wintering wildfowl and waders (and some breeding birds), but also to improve general biodiversity. Grazing will be also prevent areas from becoming excessively rank. The lower saltmarsh and mudflat habitats are not anticipated to receive any habitat management. With regards to visitor management, plans will be prepared for the construction phases and the completed nature reserve. A phased approach to developing new access will be adopted, building on the current access to the Defra site, taking account of health and safety requirements during construction and the fact that much of the wildlife interest will not develop until construction is complete. The completed nature reserve will have three zones (labelled '*Discovery*', '*Adventure*' and '*Wilderness*'). Vehicular access will be facilitated, and two car-parking areas provided in time, with the bigger one ultimately accommodating 100 cars and 2 coaches. As aforementioned, the site will include a multitude of visitor facilities, and a visitor centre is likely to be added in due course (subject to a separate planning submission).

An independent Technical Advisory Panel comprising local representatives from Natural England, the Environment Agency, the Crouch Harbour Authority, Rochford District Council and Cefas along with Wallasea Farms Ltd., the RSPB and consultants ABPmer and Faber Maunsell will be responsible for overseeing the project's environmental quality and project objectives. Panel decisions will be informed by a comprehensive monitoring package, the methodology of which will be decided by the Panel, but which will include: (1) impact verification monitoring (immediately before and after breaching to confirm the findings and assumptions of the assessments (described below)); (2) sediment settling and ecological functioning monitoring (on an ongoing basis during the construction and post-breach stages to verify the interrelated aspects of sediment settlement, habitat creation and ecological functionality), and (3) mitigation habitat success monitoring (post implementation for a set period, to determine whether the created habitats within Cell 5 are functioning as expected). A local liaison group will also be established with representative from the local community, Essex County Council and project staff.

## Alternative Options

With respect to alternatives, the do-nothing option was addressed as part of the overall project rationale above (i.e. the risk/high likelihood of an unmanaged/'natural' seawall breach). In terms of alternative locations, as aforementioned, Wallasea Island is ideal due to the absence of infrastructure, but also its peninsula land form, the flood defence need, the risk of unmanaged flooding, the relatively low productivity of the agricultural land and a supportive

landowner. There are very few opportunities available on the coast of Essex or the wider UK where projects of this magnitude and importance can be carried out without affecting existing infrastructure. The RSPB has examined the suitability of claimed land for coastal habitat restoration and identified the suitability of Wallasea Island due to its size and location. In addition to considering the possible different locations for the realignment, a number of alternative scheme designs were considered for this preferred location, and the scheme went through several iterations before what is considered to represent the best solution and the one that will meet the needs of all the stakeholders and interested parties was chosen. The amount of recovered material required to achieve it represents the optimal solution for the Island and it also represents the most appropriate and comprehensive approach that can be taken to address the risk to the estuary. Any more fill will create less intertidal habitat while any less fill will increase the risk to the estuary system.

## **Legal Requirements and Consents**

For this proposal a formal Environmental Statement (ES) is required to accompany the planning application to Essex County Council. As the site is located partly within a European Marine Site and Ramsar area, an Appropriate Assessment (under the Habitats Regulations) may also be needed, and a signposting document is included as an Appendix. There was a need to determine whether any species protected under national and European legislation will be affected by this proposal and if so what measures can be taken to avoid this. A series of consents and licences will need to be acquired for this project, and the RSPB has had initiated dialogue with the key statutory authorities and consenting regulators. A myriad of national, regional and local planning guidance and planning documents are of relevance to the proposed RSPB Wallasea Island Wild Coast project, which have been considered during the planning and design of the scheme. To ensure that the proposal complies with the Planning Guidance for the area, the Regional Spatial Strategy, Essex and Southend-on-Sea Replacement Structure Plan, the Essex and Southend Waste Local Plan and the Rochford District Council Local Plan were studied particularly closely. Pertaining to the recovered inert materials which are to be used, although these are by planning definition Construction and Demolition waste, with small exceptions, it will not contain any concrete or other residue. Within the government's waste hierarchy therefore the material will be reused for engineering purposes and can be identified as being close to the top of the waste hierarchy/pyramid (the very top being waste reduction). The Essex Waste Plan meanwhile states that landfill or land raising for its own sake will only be permitted if necessary for restoration, and that landfill outside the boundaries of preferred sites will only be permitted if it can be demonstrated that satisfactory restoration cannot otherwise be achieved. Both objectives apply to the Wallasea Island Wild Coast project.

## **Assessment Approach**

Prior to the EIA, the RSPB carried out extensive consultation, the results of this were used to inform the Scoping Study and this subsequent assessment. The Scoping Study identified the issues upon which the assessment needed to concentrate and the resulting Scoping Opinion was received from Essex County Council. Further consultations were then held throughout the impact assessment process with a range of authorities and interested parties where required.

An extensive review of local planning guidance documents and other information sources was carried out. A large number of surveys and studies were conducted to fill any gaps in the existing information and provide a detailed baseline description of the proposed coastal habitat creation site and of the adjacent estuaries. These included a computer modelling study and a series of supporting data collation surveys which were carried out to describe the effects of the scheme on the water flows and physical conditions in the estuary as well as surveys of bird populations, insect communities, inland habitats, shoreline habitats and protected species in and around the site. A 3D computer visualisation of the scheme was also produced to aid understanding about the character and visual appearance of the site after realignment.

## Impact Assessment

A standard approach was applied to identify the significance of the impacts from the proposal and impact levels were identified for each of the key issues. These impacts can be either

- (1) **Negligible** – Insignificant change(s) not having a discernable effect;
- (2) **Minor Adverse Significance** – Effects which tend to be discernable but tolerable;
- (3) **Moderate and Major Adverse Significance** – Impacts requiring some reduction or mitigation measure(s).

They can also be beneficial at each of these different levels if they are judged to provide some environmental, economic and/or social gain. The impact of the proposed Wallsea Island Wild Coast project was assessed according to eleven key subject areas as reviewed below:

### Physical/Hydrodynamic Environment

The computer modelling and survey work indicates that the breaches will have a **negligible** direct effect on the shoreline because they are positioned and designed to minimise such effects and because the flows through the breaches will be insufficient to cause erosion of the coastal sediments. However, to limit the risk of unmanaged breaching/wall collapse and subsequent potential adverse effects on navigation, two mitigation measures have been agreed with the Crouch Harbour Authority, namely: infilling of the inside of the existing walls to fix the wall alignments, and stripping of rock revetment for a distance of 60-100m either side of a breach (to avoid slipping into, and obstruction of, navigation waters). Following realignment, changes of a relatively small scale nature and duration are expected to occur in the estuary with regards to flow speeds and water levels during flooding and ebbing tides as the system accommodates the additional volume of water that moves in and out of the estuary on each



tide. Overall the short-term effects of the scheme on the physical conditions in the estuary were considered to be **minor**. Similarly, maximum flow speeds into and out of the breaches themselves are relatively low at less than 1m/s, with the smallest flow speed associated with the Breaches further up the Roach; flows are expected to integrate well into the prevailing estuary flows, and thus the overall effects on estuary hydrodynamics are expected to be **negligible**. Over periods of hundreds of years the estuary is expected to respond by widening and deepening in the outer estuary areas. This change is **minor** over these timescales and should be seen in the context of the future development of the estuary which, following realignment, will have an increased level of sustainability and a better ability to cope with sea level rise. As no net export of sediment from the site is predicted, there are not expected to be any impacts on water quality conditions and sediment accretion/erosion, and impacts from this pathway are considered to be **negligible**. Overall the effects on the physical environment are therefore considered to be **minor adverse**.

### **Water and Sediment Quality**

As the breaches are expected to be stable and the sediments in front of Wallasea Island have low levels of contamination, the water moving in and out of the site is expected to have **negligible** effects on water or sediment contamination. This is confirmed by the modelling which shows no significant increase in suspended sediment in the estuary after implementation. Any accidental pollutant releases during construction work will be controlled through appropriate planning. Material excavated from the intertidal fronting Breach 1, wherein a limited amount of sediment contamination was found, will be deposited in a safe location on site, hence the impact from this pathway was considered **negligible with mitigation**. Through set-aside and careful wet material placement and containment, the release of land-borne contaminants into the estuary will be prevented, and the effects are thus expected to be **negligible with mitigation**. Due to the oxygen enrichment features inbuilt into the scheme, the cessation of arable agriculture in such close proximity to the watercourse, the nutrient cycling/burial and carbon sink properties of intertidal habitats and the Water Framework Directive associated benefits, the project is expected to have a **beneficial** impact on the ecological potential of the estuary, so that overall impact is deemed to be **minor beneficial**.

### **Nature Conservation and Ecology**

The flooding of the land, and associated breaching and landforming works within designated proportions of Wallasea Island will result in the loss of some important plant species and invertebrate communities on the seawall, as well as in the borrow dyke and on the grassland berm immediately behind the existing seawall. These are of international value but are also widely occurring locally. The impacts will be offset by the both the temporary nature of some of the losses, and mitigation measures (incl. the creation of new comparable (and more extensive) land and aquatic habitats in Cell 5 and within the site itself, and also plant cutting translocation for natural re-seeding). Therefore these effects are **negligible with mitigation**. There will be some minor losses of/changes to internationally protected saltmarsh and mudflat in front of the breaches which will be amply mitigated as an inherent part of the design, so the impact is considered **negligible with mitigation**. As aforementioned, the physical changes to

the estuary are expected to be negligible, and hence effects of the scheme on the designated features within the estuary will be the same. As this scheme will prevent the likely occurrence of a natural breach on Wallasea Island, which would have significant negative effects on the wider estuary, the scheme is considered **beneficial** in this respect. Ultimately, with the mitigation habitats in place, the scheme will create a rich mosaic of new habitats which will enhance the site's value for plants and invertebrate species and the scheme is considered to be of **moderate beneficial significance** over the longer term.

There are several protected species on site and various mitigation measures (including habitat creation) have been proposed and integrated into the scheme design to reduce impacts on these. Firstly, to avoid disturbance of bird nests, affected areas will be cleared of vegetation prior to the spring months, and the impact has hence been reduced to one of **minor adverse significance with mitigation**. Five Biodiversity Action Plan bird species are breeding on Wallasea Island; with the exception of corn bunting, the impact on those was considered to be of **negligible to minor adverse significance** as they are expected to find alternative feeding and nesting areas on site and will very likely have higher brood incidents. With respect to corn bunting, the population within the project area represents a considerable percentage of the UK's population (c.0.8-1.25%), and the proposed habitats are thought to be of some, but limited, suitability to this species. Hence, two mitigation measures have been proposed, namely managing a 15ha section in Cell 5 as arable 'wild bird cover' habitat targeted specifically at corn buntings, and employing a farmland advisor for five years to encourage farmers within the vicinity of Wallasea Island, and the wider Essex coastal region to enter High Level Stewardship schemes. Thus the impact has been reduced to one of **minor adverse significance with mitigation**. The effects on ground nesting birds in general, however, are expected to be of **moderate beneficial significance** over the longer term. Another protected species found on site are water voles, which preferentially use the borrow dykes and a remnant saltmarsh creek. As aforementioned, a mitigation habitat will be created in Cell 5, and (in agreement with Natural England), the mammals will be encouraged to migrate naturally by draining down water levels. With these measures in place, the impact is considered to be of **minor adverse significance with mitigation**. Three badger setts were found on site; one (the main sett) will not be affected, and exclusion zones around this will be observed during construction. The other two outlying setts will be closed if active, and hence overall, there is thought to be an effect of **minor adverse significance with mitigation**. There are two protected reptile species on site (common lizard and adder); to avoid affecting these they will be removed from affected areas of the sea wall before breaching and land forming and placed at a suitable alternative location within the site. The effect on these species is therefore of **minor adverse significance with mitigation**. Overall, considering the long-term benefits from having the scheme in place, the residual impacts on protected species result in there being **negligible to minor adverse effects with mitigation**. It is relevant that, as with the review of the impacts to estuarine habitats, consideration is given to the risks of unmanaged flooding on this Island. The proposed scheme will remove this risk and therefore avoid any substantial impacts to protected species (and habitats) from unmanaged flooding. In this context, the scheme and its associated mitigation measures should collectively be viewed as a beneficial effect.

The results of the hydrodynamic modelling work, and the water quality assessment, indicate that there will be no significant adverse effects on estuarine water quality. Therefore any effects on the habitats and species of the estuary will be **negligible**.

With respect to overwintering birds and the construction phase, due to the narrow and discrete impact zone and relatively limited use made of much of the intertidal around Wallasea, and the ability of birds to quickly habituate to noise (particularly roosting birds), the impact on birds utilising the surrounding intertidal is considered to be of **minor adverse significance with mitigation** (the latter being no breaching within the overwintering period). Impacts on birds feeding on the Island at high tide (including significant numbers of Brent geese, the qualifying bird species for the Crouch and Roach Estuaries Ramsar and SPA sites) are thought to be limited. This is due to the phased construction approach, whereby large expanses of arable will remain available, and as the Cells develop, algae and other plants (including those identified first and second choice feeding plants for Brent geese) will grow in the grassland and mudflat areas, thus effects are expected to be **negligible to moderately beneficial**. Overall the effects of the construction phase on overwintering birds utilising the Island and surrounding habitats are consequently **negligible with mitigation**.

Once the scheme is operational, it is expected that the proposed new habitats, which will be managed to enhance bird value, will attract a considerable number of overwintering and breeding birds (due to a redistribution of birds within the estuaries, and an eventual slight overall increase). Hence, overall, the scheme is thought to lead to **major beneficial** effects. Visitors and other activities are expected to cause negligible disturbance and as such the scheme overall can be considered as having **major beneficial impacts** for shorebirds.

The potential impact of the scheme on the ability of the Defra site to achieve its compensation targets was assessed separately. It was thought that there was potential for a significant impact linked to possible disturbance due to the fill delivery works. To limit disturbance, it was agreed that the unloading facility construction will be undertaken outside of the overwintering period, that down lighting will be installed and that a watching brief will be kept on monitoring results. With these measures in place, and considering the relatively limited use by overwintering birds of the immediately adjacent areas, and the temporary nature of the conveyor and pipeline platform, the impacts were considered to be **negligible with mitigation**.

### **Commercial and Recreational Fisheries**

Given the findings from the water quality and physical assessment (showing negligible change), and lessons learned from other sites, the potential effects on shellfisheries are considered to be **negligible** (although there is a potential beneficial impact as opportunities may exist to expand oyster/shellfish cultivation activities into the realignment site). Lessons from the Defra site, and other managed realignment sites, has shown that the scheme will provide new valuable feeding and nursery areas for adult and juvenile fin fish species (e.g. bass) which means that overall, the impacts for recreational fishing will be **moderately beneficial**.

## Archaeology

Following a project specific assessment, it has been concluded that the archaeological potential of the proposed realignment site is low and that those remains which may be present, are of minor significance. However, as there is local **potential for minor adverse impacts** due to excavation works, a watching brief will be kept during any excavation works, and archaeological monitoring is suggested to take place during construction in a limited number of specific areas (incl. breaches). Impacts from non-excavation works were generally considered **negligible**. With the measures in place, the overall impacts are considered to be **negligible with mitigation**.

## Navigation and Marine Recreation

Firstly, with regards to impacts of the construction/fill delivery works on sailing or shipping, with appropriate risk management measures such as notices to mariners, active communication with local yacht clubs and appropriate markings/illumination to the unloading facility, collision risks with either the temporary unloading facility or the ships were considered to be **negligible with mitigation**. The findings from the physical assessment indicate that there will be no discernable effects on sailing boats or power craft that currently use the estuary. This is because only transient minor changes in flow and water levels are expected. Areas close to the breach points will have different flow directions at ebbing and flooding tides that will have very localised effects on small craft passing close by but otherwise any changes are not likely to be detectable and effects will be **negligible with mitigation** (the latter being notices to mariners and markings). The proposed scheme will at worst have negligible impacts on two existing recreational activities and instead will provide a considerable number of new or improved amenity opportunities. These beneficial recreational changes, and particularly the increased value for birdwatchers and walkers, will contribute to the environmental and recreational improvements envisaged by the Thames Gateway scheme. Overall therefore the scheme is likely to be at least **moderately beneficial**.

## Road Transport

Two scenarios were tested during this assessment; one which was considered most likely, i.e. 50,000 visitors accessing the site by car every year, and a worst case 100,000 visitor scenario. It was found that neither scenario would attract a significant amount of additional traffic in the busiest weekday hours, and that the scheme's impact should hence be considered as **negligible**. The impact of construction plants was assessed as negligible during the scoping process, and hence scoped out - because once these have been moved to the Island by road, they will generally remain on site for substantial periods.

## Noise

Noise impacts were firstly assessed with respect to the construction phase; this was based on predicted noise levels and assumed acceptable daytime and night time levels. Of the three receptor sites identified, only at Burnham on Crouch (min. 1.2km away, across the estuary) was it found that night time noise levels could occasionally be exceeded by 5dB during material delivery. To mitigate, several practical noise reduction measures were suggested, which would reduce the impact to one of **minor adverse significance**. At all the other receptor sites (Creeksea Ferry Road Cottages on Wallasea and Foulness Islands) and for all the other construction activities, impacts were considered minor. It was furthermore concluded that vibration should have no impact on any of the receptors. Overall therefore, noise impacts during construction will be **minor with mitigation**. The effects of noise due to visitor traffic, based on the projected traffic data, were considered to be **negligible**. Other sources of noise post implementation will be limited, and not exceed baseline agricultural activities, and hence the effects would be **negligible at worst**.

### **Air Quality**

With respect to air quality effects of anticipated car-based visitor traffic post implementation, notwithstanding the proximity of residences, the overall impact of the scheme on air quality was considered **negligible**. A dust assessment was also carried out to assess the effect of the construction works on dust levels in the area. Considering the distance of the receptors to the principal works (min. 1.5km) and key dust minimising factors integral to the design (incl. high clay content), only under certain dry and windy conditions was there thought to be a potential for an adverse impact, and hence mitigation measures will be in place during such conditions (incl. water bowsers). Impacts were thus considered to be **negligible with mitigation**.

### **Aviation Safety**

As the proposed coastal habitat creation work on Wallasea Island lies within a 13km radius of London Southend Airport (the statutory aerodrome safeguarding consultation zone), an assessment on the risk of increasing bird strike risk at this airport was undertaken. Based on consultations with airport personnel, and a review of available literature, it was concluded that the risks would be **negligible**. This was because aircraft generally pass Wallasea at heights well above the levels at which birds will fly around the reserve and because the development is not expected to lead to more birds traversing London Southend Airport's airspace. Although the risks to the airport were considered to be low, the RSPB fully recognises the importance of the issue in public safety terms, and has hence agreed an Aviation/Bird Management Plan with London Southend Airport's airport safety personnel.

### **Agriculture**

The consequences of the proposed change in 'land use' on Wallasea Island and especially, the effects of the loss of existing agricultural land/soil in Cells 1-4 was considered. It was found that the soils within the Wallasea Island Wild Coast project land are of a relatively low quality and produce comparatively low arable yields. To continue farming, major investment will be

necessary shortly to significantly upgrade some 7km of seawalls and replace the failing subsurface drainage system. Either activities are viewed as uneconomic by the land owners, and Government has indicated that it will not make monies available for either seawall maintenance or new build. Following advice from Natural England, the topsoil covering approximately 150ha (in Cells 1 to 4) will be stripped and reused in grassland areas (according to government best practice guidance). Given the nature of the scheme, the quality of the existing land and the proposed mitigation measures, as well as the high risk of an unmanaged breach, it was concluded that the benefits of the proposed new habitats outweigh the resultant loss of agriculture and that the overall effects of the loss of the land were therefore considered to be negligible.

## **A Note on Socio-Economic Effects**

As a separate element, and not part of the assessment, a review of the expected socio economic effects was provided. Several of the conclusions concerning these have already been summarised above, including the likely creation of 16 to 21 Full-Time Equivalent jobs. The costs of both of continued coastal defence infrastructure maintenance and of an unmanaged flooding scenario were also estimated by a study undertaken on behalf of East of England Development Agency (EEDA); this determined costs savings from the proposed RSPB scheme would be between £650,000 and £5–10million over the next 10 years. As aforementioned, existing infrastructure will remain (largely) unchanged, and in some cases safeguarded; and oyster lays and marine recreation will not be negatively affected. The habitats which will be created will have various socio economic benefits, including fish productivity gains; carbon storage benefits and general recreation and amenity improvements.

## **In-Combination/Cumulative Effects**

Having consulted Essex County Council and the Environment Agency specifically, and other organisations informally during the extensive consultation process undertaken for this EIA, no proposals were identified which could have potential cumulative effects with this proposal. Thus, no cumulative or in-combination review was warranted or could be undertaken.

## **Monitoring and Mitigation**

Previous sections of this Non Technical Summary contain details on monitoring and mitigation aspects. In summary, three mitigation measures in the form of habitat creation work within Cell 5 were a pre-determined and integral part of the overall scheme design; namely the brackish water vole marsh which would also benefit invertebrates, the saline lagoon which would benefit invertebrates, and the rotational arable wild bird cover area. Numerous other mitigation measures will be necessary, and these have been set out in the assessment summaries.



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Monitoring was reviewed in the 'Site Management' summary, and will consist of three main aspects: (1) impact verification monitoring (pre and post breaching); (2) sediment settling and ecological functioning monitoring (ongoing and post-breach), and (3) mitigation habitat success monitoring (post implementation).

## Acknowledgements

For this Environmental Impact Assessment, a large number of organisations and individuals were consulted by the RSPB (as part of a detailed Communication Strategy) to obtain their views about the RSPB Wallasea Island Wild Coast coastal habitat creation proposal. From this extensive consultation process, and associated presentations, a large number of responses (which were mainly positive) were received. These have been invaluable in ensuring that relevant issues were considered for the purpose of this Environmental Impact Assessment. We would like to thank all those who contributed to this process and to the team that have supported the assessment process.

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