EU HABITATS DIRECTIVE AND HABITAT COMPENSATION

Spatial planning in England and implementing habitat compensation under Article 6(4) of the Habitats Directive

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Abstract

The Natura 2000 network comprises protected areas designated under the EC Birds and Habitats Directives. Articles 6(3) and 6(4) of the Habitats Directive establish a robust system of protection for Natura 2000 sites, only allowing damage from plans or projects in exceptional circumstances. Where damage is allowed, compensatory measures must be provided to protect the overall coherence of the Natura 2000 network.

EC and UK Government guidance on compensatory measures states they should provide the same ecological functions as those lost, be located as close as possible to the damage and fully functional before damage occurs. In the UK, 13 projects have required compensation since the Habitats Directive came into force in 1994: most provided compensatory measures at or after damage to the Natura 2000 sites. The main reason for this was that compensation was not addressed until the project stage.

A European Court of Justice judgment against the UK Government in 2005 required Articles 6(3) and 6(4) to be applied to spatial plans. The study sought to answer the question of whether the spatial plan system in England can implement Article 6(4) habitat compensation, with reference to compensation cases on the Humber estuary. Emphasis was placed on whether the time lag experienced at project level could be overcome through better spatial planning.

The study found the UK Article 6(4) compensation market is largely restricted to two sectors: flood risk management and ports. Based on historic cases and the structure of the industry, the future compensation needs of ports are likely to be relatively small, ad

hoc and localised. In contrast, the flood risk management sector is predicted to give rise to large scale and widespread compensation needs as it seeks to tackle the impacts of sea level rise and coastal squeeze on coastal habitats in Natura 2000 sites.

The spatial plan system should play an important role in both sectors: safeguarding sites identified in flood risk management plans as necessary to compensate for the impacts of flood defences over 50-100 years, and for ports through identifying and allocating suitable compensation sites.

Through wider application of the Shoreline Management Plan and Flood Risk Management Strategy system, the Environment Agency and other flood risk management bodies should create a self-contained strategic compensation market capable of providing fully functional habitats in advance of predicted Natura 2000 losses. The spatial plan system is well positioned to safeguard these sites so that they are available to provide fully functioning compensation ahead of damage.

A range of stakeholders, including the ports industry, supported the need for ports to provide fully functioning habitat compensation before damage. However, the study found that ports currently lack a coherent spatial planning system that can operate on the timescales to meet this objective. In the absence of such a system, the study suggests potential might exist in some form of integration with the flood risk management compensation market. The study concludes that further work is required to assess the feasibility of such a system.

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Abbreviations

ABBREVIATION	EXPLANATION
2004 Act	Planning and Compulsory Purchase Act 2004
AA	Appropriate Assessment (under Article 6(3) of the Habitats Directive)
ABP	Associated British Ports
Amendment Regulations 2007	Conservation (Natural Habitats, &c.,) (Amendment) Regulations 2007
Birds Directive	Council Directive on the conservation of wild birds (79/409/EEC)
CHaMP	Coastal Habitat Management Plan
CWA	Clean Water Act 1972 (United States)
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
DPD	Development Plan Document
EC	European Commission
ECJ	European Court of Justice
EPA	Environmental Protection Agency (United States)
ESA	Endangered Species Act 1973 (United States)
EU	European Union
FCS	Favourable Conservation Status (under Article 2 of the Habitats Directive, defined in Article 1)
FRMS	Flood Risk Management Strategy
ha	hectares
Habitats Directive	Council Directive on the conservation of natural habitats and wild fauna and flora (92/43/EEC)
Habitats Regulations 1994	Conservation (Natural Habitats, &c.,) Regulations 1994
HCP	Habitat Conservation Plan under the ESA
HFRMS	Humber Flood Risk Management Strategy
HoC	House of Commons
IOH	Immingham Outer Harbour
IROPI	Imperative Reasons of Overriding Public Interest (test under Article 6(4) of the Habitats Directive)
ITP	Incidental Take Permit (under §10 ESA)
LPA	Local Planning Authority
NLC	North Lincolnshire Council
PPS	Planning Policy Statement

ABBREVIATION	EXPLANATION
Ramsar site	Site listed under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat
RPB	Regional Planning Body
RSPB	The Royal Society for the Protection of Birds
RSS	Regional Spatial Strategy
SAC	Special Area of Conservation (under the Habitats Directive)
SMP	Shoreline Management Plan
SPA	Special Protection Area (under the Birds Directive)
SSSI	Site of Special Scientific Interest (under the Wildlife and Countryside Act 1981)
UK	United Kingdom
USFWS	United States Fish and Wildlife Service
WAG	Welsh Assembly Government

1 Introduction

1.1 Background

The EU has committed itself to the major task of halting the decline of the EU's biodiversity by 2010 (European Council, 2001) and to restore habitats and natural systems (CEC, 2006). This represents an even more ambitious commitment than that subsequently entered into by the EU and 187 other countries at the 2002 Conference of Parties to the Convention on Biological Diversity in the Hague "*to significantly reduce the rate of biodiversity loss* [globally] *by 2010*" (CBD, 2002).

The main mechanisms available to the EU to fulfil this commitment are two key pieces of environmental legislation: the Birds Directive (CEC, 1979) and the Habitats Directive (CEC, 1992). These are the cornerstones of the EU's efforts to protect biodiversity and reverse the decades of decline experienced by the EU's wildlife.

Both Directives use the twin track approach of habitat and species protection. Central to achievement of the former is the creation of a EU-wide network of protected areas known as Natura 2000. This network comprises Special Protection Areas (**SPAs**) for birds and Special Areas of Conservation (**SACs**) for habitats and other fauna and flora of European Community interest. The critical value of the Natura 2000 network to the achievement of the targets to halt and then reverse historic declines in wildlife has recently been demonstrated

by BirdLife International (Donald et al., 2007) which showed that the rate of recovery of rare and vulnerable birds listed on Annex I of the Birds Directive was significantly greater inside the EU than outside and that SPAs were vital to this.

The legal mechanisms to protect Natura 2000 sites from damaging land-use change are set out in Article 6 of the Habitats Directive. In particular, Articles 6(3) and 6(4) set out a strict decision-making regime that applies to plans or projects judged likely to have a significant effect on a Natura 2000 site. Any such plans or projects must be subject to an appropriate assessment to assess their potential impacts on a Natura 2000 site. Only if there is no adverse effect on the Natura 2000 site can the plan or project proceed. In exceptional circumstances[1] set out in Article 6(4), a damaging plan or project may proceed provided compensatory measures are secured that ensure the overall coherence of the Natura 2000 network is maintained.

Articles 6(3) and 6(4) were transposed into British law by §47-53 of the Habitats Regulations 1994 (HMSO, 1994). These provisions applied only to project level proposals in the UK e.g. planning applications: spatial plans and other land-use plans were specifically excluded by Government policy (for example, see paragraph 54 in ODPM, 2005a). Despite this policy, there had been some

[1] The exceptional circumstances require a proponent to demonstrate (i) that no alternative solutions to the plan or project exist and (ii) that the damage to the Natura 2000 site can be justified for imperative reasons of overriding public interest.

informal application of appropriate assessment to development plans (see (Knass, 2000) and (Institute of Ecology and Environmental Management, 2006)).

In October 2005, everything changed in respect of development (now 'spatial') plans. Following infraction proceedings by the EC against the UK Government, the ECJ issued a judgment in relation to the UK's implementation of the Habitats Directive (**the UK ECJ judgment**)(European Court of Justice, 2005)(see Appendix 1 for relevant extract). The judgment, *inter alia*, required the Government to implement Articles 6(3) and 6(4) in respect of the preparation and production of spatial plans. Implementation of the judgment into UK law has taken some time. Amendment Regulations were consulted on in all UK countries in summer 2006, brought into force in Scotland in February 2007, and August 2007 in England and Wales and Northern Ireland.

Application of Articles 6(3) and 6(4) at the strategic plan-making stage offers considerable potential benefits over waiting to the project level stage. These include:

- Improved consideration of cumulative effects of plans and projects on Natura 2000 sites;
- Strategic consideration of less damaging alternative solutions to the plan or project in order to avoid damage to a Natura 2000 site; and

- Where potential damage to a Natura 2000 site is considered justified, strategic consideration of the location, suitability and provision of compensatory measures.

This study concentrates on how the significant challenges posed by the compensatory measures requirement of Article 6(4) can be addressed by the spatial plan system, and will consider whether that system confers any advantages over the traditional project-level treatment of compensatory measures. For practical reasons, the study confines itself to the English spatial plan system.

The EC has made it clear that compensation is a last resort "*when other safeguards provided by the* [Habitats] *directive are ineffectual…"* (CEC, 2007). In the UK, the strict requirements of Article 6(4) that require proponents of damaging proposals to demonstrate no alternative solutions and justify the damage for imperative reasons of overriding public interest have acted robustly to protect Natura 2000 sites. As a result, very few proposals have required compensatory measures, with nearly 70% of them in the ports and flood defence sectors (see section 6.1.1).

However, the historic lack of a requirement in the UK to apply Articles 6(3) and 6(4) to strategic land-use plans has often resulted in the need for compensation measures for damaging projects being identified and dealt with at a late stage in the project planning and consenting process. This has led to concerns that

compensation measures would not achieve their purpose due to delays in delivering fully functional habitat and uncertainty over whether that habitat would achieve the required ecological outcomes. Addressing these concerns (or risks) has often proven costly to the scheme proponent, as it has required over-provision of habitat.

The study will review project level experience of compensatory measures, in particular ports and flood defence schemes on the Humber Estuary, to provide practical insights into the challenges and opportunities facing the spatial plan system in complying with this new legal requirement. The Humber Estuary has been selected as a case study as it is the only part of the UK where several compensation schemes have been implemented, and, in the draft Environment Agency Humber Flood Risk Management Strategy (**HFRMS**) (Environment Agency, 2005b), it provides the first example of a strategic approach to the identification of compensatory measures.

The spatial planning system affecting the Humber is increasingly integrating with the ports and flood defence sectors, which exert a strong influence on its long-term economic, social and environmental well-being. This is likely to result in spatial plans having to address the compensatory requirements arising from future port proposals and strategic decisions on the approach to flood risk management around the Humber.

1.2 Aims and objectives of research

Relatively few cases in the UK have required the provision of compensatory measures. Typically, consideration of compensation measures has arisen part way through the consent process, and has often resulted in:

- Difficulty in locating suitable and acceptable habitat compensation sites close to the damage; and
- Delay in providing fully functional habitat compensation until after the damage occurs.

In seeking to address the various problems posed by delays in consideration and implementation of habitat compensation, various commentators have been supportive of the adoption of a form of advanced habitat provision known as "mitigation banking' or "habitat banking", which is common practice in the United States of America (for example, see (Crooks and Ledoux, 2000), (Gillespie and Hill, 2007) (Smith, 2000)). To date no-one, to the author's knowledge, has considered the advanced provision of habitat compensation in the context of the application of Article 6(4) to spatial land-use plans.

The main aim of the research was:

- To assess whether the spatial plan system can implement the requirement for habitat compensation under Article 6(4) of the Habitats Directive.

In order to address this aim, the study had the following objectives:

- Analyse the requirements to secure habitat compensation under Article 6(4) through a strategic land-use plan system;
- Review strategic habitat compensation provision systems (habitat banking) elsewhere in the world and identify any lessons that can be applied to the UK;
- Seek the opinions of key players involved in habitat compensation cases in the UK and obtain their views on the problems and opportunities arising from a strategic approach to habitat compensation provision;
- Identify any shortcomings in the current spatial plan system in England that need to be addressed in order to enable it better to implement the compensatory measures requirement of Article 6(4) of the Habitats Directive.

2 Methodology

The research was broken down into two main components: background research and primary research. The former reviewed the legal and policy framework relating to application of the Habitats Directive in the UK to spatial plans, with particular reference to guidance on compensatory measures, alongside a brief review of strategic habitat compensation provision in the United States of America. Primary research centred on a series of interviews with key stakeholders in the habitat compensation arena in the UK, focusing on practical experience from the Humber estuary.

2.1 Background research

As the research seeks to determine if the spatial plan system is able to implement the requirements for compensatory measures under the Habitats Directive, it is essential to understand the legal and policy context for such measures. A review is carried out of the policy and legal guidance on Article 6(4) compensatory measures at a EU and UK level and key principles distilled out.

The study is set in context with an overview of current thinking on how the decision-making requirements of Articles 6(3) and 6(4) will apply to spatial plans in England and the flood risk management sector. The latter is important given that sector's increasing importance in spatial planning and in generating

long-term habitat compensation requirements in response to sea level rise and climate change.

Given that the strategic provision of habitat compensation is new to the UK, a literature review was carried out of relevant experience in the United States to see if this shed useful light on possible future practice in the UK.

2.2 Primary research

In determining whether the strategic provision of habitat compensation through the spatial plan system is possible, practicable and of any benefit, it is necessary to review critically practical experience of compensatory measures in the UK. There have been relatively few habitat compensation schemes consented in the UK, and even fewer implemented.

The greatest concentration of implemented compensation schemes is found on the Humber estuary on the east coast of England. This area was selected as the main focus of primary research. A series of semi-structured interviews[2] was conducted with key stakeholders at local and national levels, with experience of the Humber estuary, to obtain their views and perspective on habitat compensation at both project and plan levels and draw out their views on: (i) the compensatory measures requirements of Article 6(4) in general; (ii) lessons learned from historic habitat compensation schemes, with particular reference to

[2] The interviews were carried out in accordance with Oxford Brookes University's Code of Practice for the Ethical Standards for Research Involving Human Participants.

the Humber estuary in terms of the ecological, legal, policy and practical issues faced in implementing those schemes; and (iii) the perceived role and practicalities of implementing strategic provision of habitat compensation through the spatial plan system and linkages with the flood risk management plan system.

This provides the basis for a discussion on the practicalities of implementing compensatory measures under the current spatial plan system in England and the potential shortcomings in the current legal and policy framework.

3 Habitats Directive compensatory measures in the UK: overview and policy guidance

To understand how the compensatory measures requirements of Article 6(4) operate in the UK, it is necessary to explore the formal legal and policy framework as well as a series of informal guidance notes. This chapter provides a brief overview of that legal, policy and guidance framework and draws out key principles on the implementation of compensatory measures.

3.1 Purpose of the Habitats Directive

The key purpose of the Habitats Directive is to achieve the favourable conservation status (FCS) of species and habitats listed in the Annexes to the Directive as of Community Interest. The EC has argued the obligation to achieve FCS extends to the Birds Directive: in (CEC, 2004) they note that, while not used explicitly in the Birds Directive, FCS is implicit in the requirements of Article 2 of that Directive "*...to maintain the population of the species referred to in Article 1 at a level which corresponds in particular to ecological, scientific and cultural requirements…*".

Article 3 of the Habitats Directive makes it clear that the Natura 2000 network is the key mechanism by which to maintain or, where appropriate, restore the FCS of species and habitats of European Community importance. The mechanisms to achieve this are found in Article 6, which sets out a series of site management and site protection provisions. The ECJ has confirmed that the underlying

purpose of Article 6 is to prevent adverse effects on the integrity of Natura 2000 sites (European Court of Justice, 2004): consent should only be granted when "*...there is no reasonable scientific doubt as to the absence of adverse effects...*" (see paragraph 58, (European Court of Justice, 2004), and paragraph 24, (European Court of Justice, 2006)).

As outlined in Chapter 1, Article 6(4) does provide for exceptions to this general rule, provided strict tests on alternative solutions and overriding public interest are met. At this point, compensatory measures are required.

3.2 Purpose of compensatory measures under the Habitats Directive

Article 6(4) of the Habitats Directive is sparing in its guidance as to the scope and purpose of compensatory measures. It states simply that:

"*...the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*"

This provides four basic parameters:

- The Member State has ultimate responsibility for ensuring compensatory measures are provided;
- All necessary measures must be taken;
- Those measures must protect the coherence of the Natura 2000 network as a whole;

- The Member State must inform the EC of all measures adopted.

Detailed guidance has arisen from practical experience at project level, translated periodically into policy guidance at both EU and UK level. The following sections analyse that guidance and draw out key principles.

3.2.1 EU level guidance

At the EU level the EC has produced the main guidance on compensatory measures: initially in its general guidance on Article 6 known as "*Managing Natura 2000*", published in 2000 (CEC, 2000). *Managing Natura 2000* was partially superseded in January 2007 with publication of specific guidance on Article 6(4), with particular emphasis on compensatory measures. The compensatory measures element of the 2007 guidance draws in part on the findings of an EC study commissioned in 2004 (ATECMA et al., 2005). In addition, the Birds and Habitats Directives Task Force of BirdLife International has recently adopted a position paper on the treatment of compensatory measures under Article 6(4)(BirdLife International Birds and Habitats Directives Task Force, 2007).

An overview of the key principles set out in the EC and BirdLife International guidance is provided below.

3.2.1.1 EC guidance

This section reviews the most recent EC guidance published in 2007 (CEC, 2007). In it the EC draws a careful distinction between:

- **Mitigation measures** - minimising or cancelling the negative impacts of a plan or project on a Natura 2000 site; and
- **Compensation measures** – independent of the plan or project (and any mitigation measures) and designed to offset its negative effects in order to maintain the overall coherence of the Natura 2000 network.

Compensation is considered a measure of "last resort" once other means of avoiding an adverse effect have been exhausted and damage justified in the overriding public interest.

In defining the scope of compensation measures, the EC guidance concentrates on habitat creation or restoration. Proposing a new Natura 2000 site can also be considered but is affected by the different approaches to site selection under the Birds and the Habitats Directives. The Habitats Directive adopts a representative approach[3], providing latitude to identify additional undesignated areas of comparable quality as compensation. The Birds Directive is more constrained as it requires all of the "*most suitable territories*"[4] to have been

[3] See Articles 3 and 4, and Annex III of the Habitats Directive
[4] Article 4(1), Birds Directive

designated as SPAs, essentially ruling out designation on its own as a compensatory measure. It would not rule out eventual designation as SPA of habitat compensation designed to address specific site level impacts. The EC guidance briefly refers to other possible measures that have been used in the EU, including species reintroduction, species recovery and economic incentives to sustain key ecological functions.

In defining how compensation measures should contribute to overall coherence of the Natura 2000 network, the EC relates this to the way in which the site contributes to the achievement of FCS viz.:

- The conservation objectives of the site;
- The number and status of the habitats and species affected by the plan or project for which the site was designated; and
- The role of the site in maintaining the natural range of those species and habitats.

The EC's starting point for maintaining network coherence is clearly at the local site level. Through the use of clear, target-led objectives, compensation measures should offset the predicted impacts on relevant habitats and species and associated ecological functions, and do so in a way that maintains their geographical distribution. By tying compensation measures so closely to the affected species and habitats of a specific site, the preferred spatial location of

those measures is constrained: the area of search for suitable locations starts in the vicinity of the affected site.

A couple of key points flow from this:

- Compensation measures must be genuinely additional to measures already required to maintain the site's qualifying interests at FCS; and
- The FCS of a site is the benchmark against which to assess damage, even though the area affected may not be in FCS.

The EC specifies a strict hierarchy for the locational area of search in relation to the damaged Natura 2000 site:

- Within the site affected (provided the conditions exist);
- Outside the affected site but within the same topographical or landscape unit;
- Outside the affected site but in a different topographical or landscape unit.

As will be seen in section 3.2.2.1, practice in the UK omits the first stage in the hierarchy in favour of sites adjacent or close to the affected site.

Using the best available scientific knowledge, proposed compensation must be assessed for its technical feasibility and likely effectiveness. This will take into account the specific biotic and abiotic requirements of the affected species and habitats, and the action necessary to establish and maintain those measures at the chosen location.

Measures must be capable of being implemented over the long-term. Critical to this is ensuring a sound legal and financial basis that ensures the land is:

- Secured;
- Protected;
- Monitored; and
- Maintained.

Temporally, the EC argue that coherence is further maintained by ensuring compensatory measures are effective at the time damage occurs to the Natura 2000 site. Although the EC acknowledges this may not always be practicable, it represents a significant hardening of its stated position in *Managing Natura 2000* when compensatory measures were "*…normally to be* ***operational*** *at the time when the damage is effective*" (emphasis added).

In terms of offsetting the predicted impacts there is a significant temporal and ecological difference between measures being "*operational*" and being "*effective*" at the time of damage. While the former implies creation of embryonic habitat, the latter strongly suggests the habitat is fully functional and meeting its ecological objectives. The impact on the lead-in times to deliver compensatory measures could be considerable. Even with dynamic habitats such as intertidal mudflats and saltmarsh that can be created relatively quickly (Morris et al., 2006), it is suggested that a lead-in time of 5-10 years is necessary

to create mudflats suitable for feeding waterfowl (Atkinson et al., 2001). This impact is recognised by the EC, which suggests that where it is not possible to achieve this timing objective, additional compensation must be provided to address the interim losses. In considering the timing issue, the EC briefly discusses the option of habitat banking[5] but rejects this approach as of limited value due to the tight criteria required by Article 6(4).

Importantly, the EC notes that serious consideration should be given to reject a plan or project if its adverse effects relate to rare natural habitats, those that will take a long period of time to achieve the same ecological function as that being damaged, or where there is no reasonable guarantee of success.

A key theme running through the EC's guidance (and that of others described below) is "**risk**". The inherent uncertainty associated with creating new habitats to replace *in situ* habitat is understood to carry significant risk of failing to meet the desired ecological objectives. Risk arises from:

- Uncertainty over the nature and magnitude of adverse effects;
- Confidence in creating new habitats of equivalent quality;
- The location of new habitat in relation to the damage;

[5] The advanced provision of habitat with the intention of selling "credits" in that habitat to developers required to provide compensatory measures. Derived from the concept of "mitigation banking" that operates in the United States and discussed in detail in chapter 5.

- Any time-lag between damage and delivery of fully ecologically functional habitat.

The normal response to such risks is the provision of additional new habitat, normally at a ratio considerably greater than 1:1. No fixed rates are prescribed in (CEC, 2007), as it considers decisions should be based on the relative weight of the risk factors in each case.

3.2.1.2 BirdLife International position paper

The position of the EC and BirdLife International is very similar. They differ in their tone and style, with BirdLife International being slightly more practical and prescriptive in the advice offered. BirdLife's summary position (paragraph 16, BirdLife International Birds and Habitats Directives Task Force, 2007) on compensatory measures states that such measures should be:

- **Targeted** at completely compensating for the damage caused by the plan or project;
- **Effective** in both ecological and legal terms;
- **Sufficient** in extent to meet the ecological needs of the affected species and habitats;
- **Well-located** through compensation measures realised as close as practicable to the location where the damage will be caused; and

- **Well-timed** so that the compensation measures are fully functional before the damage is caused.

More detailed principles under these headings are contained in an Annex. In general, these accord with the EC's 2007 guidance. However, there some key differences in emphasis or the position adopted:

- BirdLife is more explicit that if it is not possible to provide compensation measures, the plan or project should not proceed;
- The provision of compensation **within** a Natura 2000 site is neither rejected or supported on the grounds that it raises complex legal and practical issues that require discussion with the EC;
- BirdLife views compensation as a last resort, but advises that discussions between proponents and nature conservation bodies on the nature of compensation should start as early as possible to minimise problems with time-lags;
- Compensation measures should be designated as Natura 2000 within a specified timetable and be provided **in perpetuity**;
- Ensuring compensation is fully functional before damage will require proponents to build the necessary timescales into their project planning.

BirdLife notes the potential of strategic planning to address the last point, but accepts the practicalities require further work. It argues that subjecting strategic

land-use plans to Articles 6(3) and 6(4) could provide an opportunity to identify, agree and implement compensation in advance of the relevant project. It draws a distinction between this targeted and audited approach and "land banking" i.e. the more speculative provision of habitat in advance of unspecified development.

3.2.2 UK level guidance

The original planning guidance in England and Wales dealing with implementation of the Habitats Directive was Planning Policy Guidance 9 (PPG9) on Nature Conservation (DoE, 1994). Both PPG9, and the implementing legislation it supports, the Habitats Regulations 1994 (HMSO, 1994), reiterate Article 6(4) and provide no practical guidance on the Government's approach to compensatory measures.

Practical guidance was, until 2005, limited to guidance[6] to English Nature and Environment Agency staff (McMullon and Collins, 2003) and a key Government decision relating to a capital dredge in Harwich Haven (DETR, 1998). In 2005, the Government replaced PPG9 with the new Planning Policy Statement 9 (**PPS9**) on Biodiversity and Geological Conservation (ODPM, 2005c). This was accompanied by a Circular that set out more detailed guidance on the implementation of Articles 6(3) and 6(4) of the Habitats Directive

[6] Although produced as internal guidance, this document has had slightly wider circulation among those organisations working in this field. However, its circulation remains relatively restricted.

(ODPM, 2005a). Informally, practice in the UK has evolved through the application of experience gained in individual cases by key bodies such as English Nature (now Natural England), the Environment Agency and the RSPB.

The following sections summarise key published sources of compensation guidance in the UK. Chapter 6 will briefly explore additional practice arising from specific UK cases.

3.2.2.1 Harwich Haven Channel Deepening decision letter (1998)

This case was the first in the UK to require compensation under Article 6(4) and provided the first significant Government guidance on its approach to compensatory measures. It concerned a proposal by the Harwich Haven Authority to deepen the approach channel to enable "*…newly introduced, deep draught container vessels adequate access to the Port of Felixstowe in sufficient number by providing a channel of 14.5m depth, as compared with 12.5m…*" (DETR, 1998).

(Morris and Gibson, 2007) summarise the main impacts of the scheme on the Stour and Orwell Estuaries SPA as: increased tidal propagation, loss of intertidal habitats due to reduced tidal exposure and accelerated erosion due to reduced sediment availability. A package of offsetting measures, initially described as mitigation, was developed to address these impacts:

- Sediment replacement in the estuaries to prevent ongoing losses; and

- 16.5 ha replacement intertidal habitat outside the SPA.

The pivotal issue in this case was DETR's decision, against English Nature advice, that the habitat replacement could not be treated as mitigation. DETR stated that in most circumstances permanent habitat replacement outside of a Natura 2000 site would constitute compensatory measures rather than mitigation because such measures would not remove actual adverse effects felt within the Natura 2000 site. This has dictated the UK approach to habitat compensation ever since: compensatory measures are provided **outside** the affected Natura 2000 site and contrasts with the EC advice (see (CEC, 2000) and (CEC, 2007) and section 3.2.1.1).

In addition, the package of measures adopted contained additional key elements:

- Comprehensive monitoring overseen by a Regulatory group; and
- Legal commitment from the operator to undertake remedial measures if the compensation did not succeed or impacts were greater than predicted.

3.2.2.2 Habitat Compensation and Flood Management: criteria and issues to be addressed in the design and delivery of compensation packages (2003)

(McMullon and Collins, 2003) represents the most comprehensive guidance on compensation measures produced in the UK to date. Its breadth of coverage has parallels with guidance from the EC and BirdLife International. It provided guidance to English Nature and Environment Agency staff on the standards to

be applied when addressing compensatory measures associated with flood management projects. The key principles are that compensatory measures should:

- Have no direct or indirect adverse effects on Natura 2000 or Ramsar sites;
- Create habitat that secures the coherence of the Natura 2000 network;
- Be technically feasible and likely to succeed;
- Be legally feasible i.e. capable of achieving consent and the operating authority has secure control over the land;
- Be dependent on the project giving rise to the compensation need;
- Be sustainable in the long term;
- Be likely to be designated as a Natura 2000 (or Ramsar) site having achieved its objectives.

(McMullon and Collins, 2003) go into considerable detail on qualitative and quantitative elements relating to the creation of habitat to secure the coherence of the Natura 2000 network. Critically, compensatory measures should "…*fulfil the same special contribution and particular function of the areas lost or damaged…at the same time, for the same purpose and in all the same relevant circumstances*." The aim is to create habitat that most closely fulfils the ecological functions to be replaced. A series of prioritised criteria is provided:

- **Habitat type**: "like for like" preferable, but main requirement is to perform the same range of ecological functions lost or damaged;
- **Timing of available functioning habitat**: should be operational at the time it is required i.e. "…*in time to offset the adverse effects which are being compensated*...".
- **Habitat quality**: achieve the best quality habitat possible;
- **Habitat area**: where new habitat will be of equal quality, the ratio should be at least 1:1 compared to that lost or damaged, increasing if the new habitat is likely to be of poorer quality or when a high level of risk is involved. A ratio of 1:1 is acceptable for sea level rise losses where habitat is created in advance;
- **Geographic location**: as close as possible to the area being lost or damaged.

3.2.2.3 Circular 06/2005: Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning system (2005)

Circular 06/2005 (ODPM, 2005a) accompanied the new PPS9. Drawing on 11 years of experience in implementing the Habitats Directive, it sets out more comprehensive guidance on Articles 6(3) and 6(4) than was contained in the original PPG9.

Guidance on compensatory measures is contained in paragraphs 29-32. Even though these paragraphs fail to make more widely available the practical

guidance set out in (McMullon and Collins, 2003) they do provide important clarification of the Government's benchmarks for assessing compensatory measures. Addressing SPAs specifically (though this advice should apply equally to SACs), paragraph 30 states:

"*...where new habitats are created as compensatory measures, the newly created habitats should be in place in time to provide fully the ecological functions that they are intended to compensate for. The newly created habitats should normally be included in the SPA network within a reasonable timescale.*"

While reiterating both formal and informal guidance already available (see 3.2.2.1-2), this statement represents a fundamental change in the Government's approach to the **timing of compensation**. Habitat compensation should now be created in a timescale that ensures it is fully ecologically functional before damage occurs – otherwise it would not be able to provide the functions it is to compensate for. The emphasis has changed from being "operational" at the time of damage (see (DEFRA, 2001), (McMullon and Collins, 2003) and (CEC, 2000)) to being effective (*c.f.* (CEC, 2007) and 3.2.1.1 above). This has significant implications for future plans or projects that trigger a need to provide compensatory measures.

While it notes certain habitats may prove irreplaceable (in line with (Morris et al., 2006)), it is ambiguous as to the appropriate response. It implies such schemes should be rejected as, by failing to secure coherence of the Natura 2000 network, they would not satisfy the Directive's requirements. It lacks the clarity

of the EC and, in particular, the BirdLife International guidance that such plans or projects should be rejected.

3.3 Summary

Taken as whole, a series of parameters can be derived for compensatory measures in the UK under Article 6(4):

- **Purpose:** maintain overall coherence of Natura 2000 through "no net loss" of qualifying species and habitats;
- **Damage:** carefully assessed, and nature and magnitude agreed. Test uncertainty using precautionary approach and realistic worse case scenario.
- **Location:** created as close as possible to the location of damage;
- **Effectiveness:** technically and legally feasible, ideally "like for like", habitat of equivalent quality and ecological function. Targeted objectives for species and habitats affected;
- **Area:** based on assessment of ecological requirements to meet species and habitats objectives. Minimum ratio of 1:1 to safeguard against risks.
- **Timing:** fully ecologically functional before damage occurs;
- **Risk:** assessed on a case-by-case basis and factored into the ecological objectives for the site and its area requirements. Main risks associated with habitat function equivalence, location and time-lags;

- **Monitoring and remediation:** legally-binding long-term monitoring package overseen by steering group comprised of regulators and, where appropriate, wildlife and other non-governmental organisations. Sets out commitments to remedial measures if monitoring highlights failings in compensation measures.
- **Protection:** land secured in perpetuity and habitat compensation to be designated as a Natura 2000 site.

4 Overview of application of Articles 6(3) and 6(4) to UK land-use plans

The following section provides an overview of how the Government proposes to implement the UK ECJ judgment in relation to land use plans. Concentrating on spatial plans in England, it also considers Government policy guidance extending the reach of the judgment to flood risk management plans in England.

4.1 Overview of Government implementation of the UK ECJ judgment

The UK ECJ judgment of October 2005 (European Court of Justice, 2005) forced the UK Government to accept that Articles 6(3) and (4) of the Habitats Directive should be applied to spatial plans. Although the judgment itself refers to "land use plans", it is clear from its language that the Court restricted its consideration to development plans within the meaning of the various UK Planning Acts.[7]

Critical to the Court's decision was the existence of the plan-led system under the UK Planning Acts. In requiring planning applications to be determined in accordance with the development plan unless material considerations indicated otherwise[8], the Court held[9] that those plans "…*may have considerable influence on development decisions and, as a result, on the* [Natura 2000] *sites*

[7] Reference to "Planning Acts" includes reference to the relevant Planning Orders in Northern Ireland, in particular the Planning (Amendment) (Northern Ireland) Order 2003 No. 430 (N.I. 8) which introduced the plan-led system to Northern Ireland.
[8] The UK ECJ judgment refers to section 54A of the Town and Country Planning Act 1990. However, the sense of the judgment would apply equally to current legislation in each country.
[9] See paragraph 55, (European Court of Justice, 2005).

concerned." As a consequence, such plans could give rise to a likely significant effect on a Natura 2000 site and require assessment under Article 6(3).

To reduce delay in implementing the UK ECJ judgment, the Government limited its response to the specific issues the Court found against it. In respect of land-use plans, this means the Government has restricted the scope of the implementing legislation to spatial plans.

Devolution has required the Government to make country-specific amendments to the Habitats Regulations. It has followed a common approach by introducing a new section (variously Part 4A or IVA) tailored to the specific spatial plan system of each country. The relevant amending regulations are set out in Table 1 below:

Table 1: Legislation implementing UK ECJ judgment into UK law

Country	**Title of legislation**	**In force**
England and Wales	Conservation (Natural Habitats, &c.) Amendment Regulations 2007 No. 1843	21 August 2007
Northern Ireland	Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007 No. 345	21 August 2007
Scotland	Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 No. 80	15 February 2007

4.2 Implementation into English spatial planning system

4.2.1 Outline of the English spatial planning system

The spatial planning system operating in England was introduced by the Planning and Compulsory Purchase Act 2004 (**the 2004 Act**) (The Stationery Office, 2004) with the objective that it contributed to the achievement of sustainable development (§39). The new emphasis on spatial planning aims to extend the traditional development-centric approach to achieve greater integration with wider land-use policies and programmes that influence the nature and function of places (see paragraph 30 of Planning Policy Statement 1: Delivering sustainable development - (ODPM, 2005b)).

The 2004 Act introduced new forms of spatial plans: Regional Spatial Strategies (**RSSs**) and Development Plan Documents (**DPDs**) prepared by Regional Planning Bodies (**RPBs**) and Local Planning Authorities (**LPAs**) respectively. Detailed guidance on procedural policy and plan preparation for RSSs and DPDs is set out in PPS11 *Regional Spatial Strategies* and PPS12 *Local Development Frameworks* respectively ((ODPM, 2004a) and (ODPM, 2004b)).

While the two-tier statutory spatial plan system of RSSs and DPDs continues to provide the framework for decisions on planning applications, to fulfil its wider sustainable development aim it must go beyond the traditional development control paradigm. Integration with sectors that exert a strong influence on land-

use development, such as flood risk management and transport infrastructure, is fundamental to the new approach.

A strong emphasis is placed on both RSSs and DPDs "localising" higher-level policy, eschewing simple recasting of such policy in favour of appropriate regional or local application that concentrates on delivering the spatial strategy. Both RSSs and DPDs should set a clear vision for the future pattern of development across their area alongside a concise strategy to deliver it. Table 2 below summarises the main elements of the new two-tier structure to help distinguish the different purpose and preparation process of each.

Table 2: Summary of RSS and DPD system (based on PPS11 and PPS12)

	RSS	**DPD**
Geographic scope	Government Office region	District/Borough/Unitary authority Provision for joint plans
Timescale	15-20 years Longer if issue requires e.g. climate change	10+ years Adapt to RSS timescales where necessary
Spatial strategy	Broad brush Identify scale/distribution of key sectors e.g. housing, employment	Detailed General conformity with RSS Set out in Core Strategy and implemented in detailed DPDs
Role	Provide clear spatial guidance for DPDs and other strategies	Delivery of spatial strategy Emphasis on means and timescales to deliver objectives

	RSS	DPD
Public consultation	Statement of public participation required Single submission document consulted on	Statement of Community Involvement required Two formal consultation stages (i) Preferred options document and (ii) Submission document
Examination	By independent Panel. Submit report to Secretary of State	By Planning Inspector – report binding on LPA
Purpose of examination	Make recommendations to Secretary of State	Test "soundness" of DPD[10]
Assessment	Sustainability Appraisal	Sustainability Appraisal

Considerable emphasis is placed on securing early involvement of key stakeholders and the wider public. RPBs and LPAs are required to set out how they intend to involve the public in formulating their spatial plans.

A key change in emphasis at the DPD level is the concept of "front loading": essentially early community involvement and input at the options stage to ensure the document submitted for examination is robust and "sound". This is aimed at avoiding last minute changes at examination: the submitted document should be "…*the last word of the authority.*" (Planning Inspectorate, 2007b). This has important implications for the way in which the need for compensatory measures is dealt with at both the RSS and DPD level.

[10] See section 20 of the 2004 Act and paragraph 4.24 of PPS12: Local Development Frameworks.

"Soundness" is a new legal requirement on DPDs and its evaluation the purpose of the public examination. A series of 10 "soundness" tests are set out in PPS12. Securing compliance with Articles 6(3) and 6(4) could help meet some of those tests:

- Consistency with national planning policy;
- Based on a robust and credible evidence base; and
- Clear mechanisms for implementation and monitoring.

RSSs and DPDs make up the statutory development plan under the 2004 Act. RSSs will normally comprise a single document. In contrast, DPDs, unlike their precursors, are designed to comprise several documents. The key components of a DPD are set out in Table 3:

Table 3: Main types of DPD and purposes (based on PPS12)

DPD	Purpose
Core strategy	Set out long-term spatial vision and strategic policies and guide lower level DPDs Broad locations for housing, employment, public services etc Drive allocation of sites in Site Specific DPDs. Can allocate strategic sites (Planning Inspectorate, 2007b)
Site Specific Allocation documents	Allocate land for specific uses, including policies necessary to deliver specific allocations
Area Action Plan	Planning framework for areas where significant change or conservation needed Focus on implementation e.g.: - Deliver planned growth/regeneration - Protect areas sensitive to change

DPD	Purpose
Proposals Maps	Spatial expression of adopted policies Updated with each new DPD Identify areas of protection e.g. Green Belt, Natura 2000 sites Identify sites for specific land-use and development proposals

4.2.2 UK Government legal and policy framework on spatial plans and Articles 6(3) and 6(4)

As with the original Habitats Regulations 1994, the Amendment Regulations 2007 do little more than restate Article 6(4). To date only the Scottish Executive has issued formal interim guidance. Both DCLG and WAG have consulted on equivalent guidance but have not yet issued it in final form.

The emphasis in DCLG's draft guidance (DCLG, 2006a) is on avoiding an adverse effect on Natura 2000 sites completely. Where an adverse effect is unavoidable and there are no alternative solutions, DCLG advises "*...as a rule, the option should be dropped.*" Based on this advice, no RSS or DPD would need to consider compensatory measures. While laudable, this seems unrealistic given that schemes at project level have already required the provision of compensatory measures.

If compensatory measures are required, DCLG requires RPBs and LPAs to consult with the relevant Government Office and clearly places responsibility on the planning authorities to implement those measures. In setting this policy,

DCLG fails to distinguish between the legal responsibility of a planning authority to put in place a spatial strategy compliant with Article 6(4), and the legal responsibility that may derive from that strategy to provide compensation arising from:

- Development for different public sector bodies e.g. local authorities, Regional Development Agencies, the Environment Agency; and
- Private sector development e.g. port-related development.

Despite making implementation of compensatory measures the responsibility of RPBs and LPAs, DCLG does not provide any legal and/or policy justification. This theme shall be returned to in Chapter 7 below**.**

The guidance produced by the Scottish Executive (Scottish Executive Development Department, 2006) and WAG (David Tyldesley and Associates and Welsh Assembly Government, 2006) offers little additional advice. WAG's does helpfully advise that planning authorities should agree with the Countryside Council for Wales any such measures, complete with an implementation and monitoring programme, in order to secure WAG support for adopting the plan.

4.2.3 Non governmental guidance on the appropriate assessment of Regional Spatial Strategies and Local Development Frameworks

To date, three separate pieces of non-governmental guidance have become available to planning authorities since the UK ECJ judgment:

- Draft advice on RSSs to English Nature (David Tyldesley and Associates, 2006);
- Guidance by a consortium of environmental consultants (Scott Wilson et al., 2006);
- Guidance from the RSPB (Dodd et al., 2007).

The advice to English Nature limits itself to repeating the legal requirement that the Secretary of State is responsible for securing compensatory measures. (Scott Wilson et al., 2006) and, in particular, (Dodd et al., 2007) reiterate the key messages of the EC and BirdLife International guidance. Emphasis is placed on understanding the potential effects of spatial strategies and ensuring compensatory measures can be put in place in an appropriate location to address fully those impacts before the predicted damage occurs. The impact of lead-in times arising from Circular 06/2005 (ODPM, 2005a) is emphasised.

(Dodd et al., 2007) draw an important distinction between the respective capability and role of RSSs and DPDs to resolve the detail of compensatory

measures, reflecting the different amounts of information available at each spatial level. This is summarised in Table 4 below:

Table 4: Summary of role and responsibility of RSSs and DPDs in respect of compensatory measures (adapted from (Dodd et al., 2007))

	Information available	**Approach to implementation**
RSS	Limited ability to predict precise adverse effects	Identify compensation need and set broad parameters to be addressed at DPD level
DPD	Greater and more precise spatial detail on adverse effects	Policy setting out detail of ecological, locational, temporal, legal and financial parameters required at planning application level Link to relevant development policy

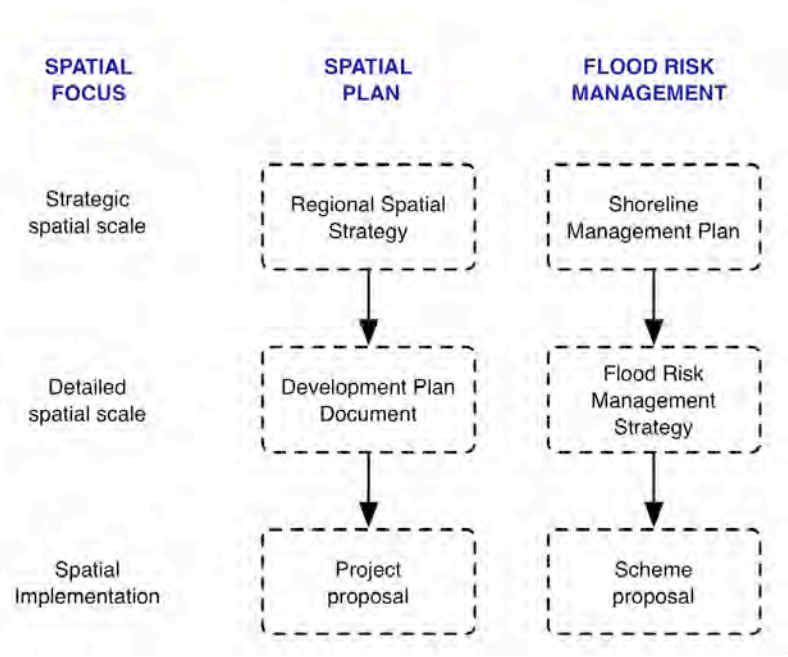
Both sets of guidance recognise that dealing with compensatory measures at plan level will require new thinking to ensure it is implemented effectively. (Dodd et al., 2007) raise the possibility of allocating land for compensation within the relevant DPD but consider it requires further work on how it would be implemented.

4.3 Application to English flood risk management system

Although the UK Government chose to confine the scope of the Amendment Regulations 2007 to spatial plans, it has recognised the potential for wider application of the UK ECJ judgment. The only formal recognition of this is contained in a legal note annexed to a letter from the Defra Head of Flood Management Division to the Chief Executives of English Maritime Councils (DEFRA, 2006a) when revised guidance on the preparation of Shoreline Management Plans (**SMPs**) was issued.

Defra's legal note accepts the UK ECJ judgment applies to SMPs (and their fluvial equivalent, Catchment Flood Management Plans), and they should be treated as plans under Articles 6(3) and 6(4). This is important given the emphasis of the spatial planning system on integrating with other sectors. PPS25 *Development and Flood Risk* (DCLG, 2006b) and the revised SMP guidance (DEFRA, 2006b) reinforce the need for the two plan systems to inform each other, primarily through the flood risk assessment process. This integrated approach between spatial plans and the SMP plan hierarchy will also be necessary in respect of the impacts on Natura 2000 sites. The spatial hierarchy of the flood risk management system has close parallels with the spatial planning system (see Figure 1 below) and provides strong opportunities for close integration.

Figure 1: Comparison of spatial focus of spatial plan and flood risk management systems



Where coastal and estuarine SMPs coincide with Natura 2000 sites it is probable they will give rise to compensatory measures as part of their response to climate change and sea level rise: many areas will lose intertidal habitats to coastal squeeze as flood defences are maintained to protect key terrestrial assets. Given the important land-use implications this will have for the spatial plan system it is considered further in Chapters 6 and 7.

5 Experience of strategic compensation provision elsewhere in the world

"No net loss" as a conservation tool for protected habitats and species is not unique to the European Union and the Habitats Directive. It has been enshrined in law and policy in several countries (ten Kate et al., 2004), the most well-known of which is probably wetland protection in the United States under §404 of the Clean Water Act 1972 (**CWA**) (Crooks and Ledoux, 1999).

To tackle problems with meeting the 'no net loss' goal arising through piecemeal compensation from individual development schemes, systems of advanced, strategic compensatory provision have been developed. This section reviews two of these systems from the United States to identify any lessons that may be applied to the UK in seeking to implement the strategic provision of compensation under Article 6(4). The systems reviewed are:

- Mitigation banking[11] under §404 of the Clean Water Act 1972; and
- Conservation banking under §10 of the Endangered Species Act 1973.

5.1 Mitigation banking under §404 of the Clean Water Act 1972

§404 of the CWA regulates the placement of dredge and fill material in '*all waters*' of the United States (Salzman and Ruhl, 2005): the term '*all waters*' has been interpreted broadly to include land-use change affecting wetlands (Crooks

[11] In this context, the American use of the term "mitigation" is equivalent to "compensation" in the UK as it is intended to replace wetland habitats or functions lost to development.

and Ledoux, 1999). Permits granted under §404 are mainly administered by the Army Corps of Engineers (**the Corps**) in accordance with joint guidelines with the Environmental Protection Agency (**EPA**) that follow a hierarchical sequence of: (i) avoid damage; (ii) minimise impacts on site that can reasonably be avoided; and (iii) provide compensatory mitigation (sic) for unavoidable losses (Salzman and Ruhl, 2005).

In requiring developers to demonstrate there is no alternative to developing the wetlands and that damage has been minimised, the §404 guidelines have parallels to the tests under Article 6(3) and 6(4). These parallels were reinforced in the original preference of the Corps and the EPA for on-site (nearby) and like-for-like compensation. However, these constraints were relaxed following pressure from developers who found them too demanding, and environmental groups concerned at the poor quality of the compensatory wetlands (Salzman and Ruhl, 2005).

At the same time, concern over continuing wetland losses led to commitments by the first Bush administration to "no net loss" of wetlands, a pledge reiterated by subsequent administrations. Despite these pledges, serious concerns continued over the effectiveness of a piecemeal, case-by-case protection of wetlands. These pressures and the fundamental change in the policy aim of §404 led to the development of a strategic approach to off-site wetland protection known as "mitigation banking".

A mitigation bank is described as:

"*…the restoration, creation, enhancement and, in exceptional circumstances, preservation of wetlands and/or other aquatic resources expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources*."

(Department of the Army et al., 1995)

Mitigation banking can make use of several habitat management techniques, but should always be provided in advance of wetland loss. The Corps' favoured hierarchy is:

- **Restoration** of former wetlands;
- **Enhancement** of low quality wetlands;
- **Creation** of new wetlands; and
- **Preservation** of existing wetlands.

The central premise is that a developer is able to buy 'wetland credits' from a mitigation bank. The mitigation bank may be run by the developer, an entrepreneur, a non-profit organisation or, in some circumstances, a regulator. A Mitigation Banking Review Team (**MBRT**) comprising various federal agencies, led by the Corps, provides consent and oversight of the bank.

Credits are derived from the quantification of wetland functions and values, both those being lost and those protected through the mitigation bank. In general, the

credit ratio is based on the relative value of the wetlands in the bank against the assumed value of those that will be lost. It is normally expressed in area terms i.e. *x* credits will buy *y* area of mitigation bank. Preserving or enhancing existing wetlands attract higher ratios than restoring former wetlands, on the basis that no additional wetland is being created.

The cost of credits is dictated by a number of factors including (from (Crooks and Ledoux, 1999)):

- Type of banker: non-profit or profit-making;
- Land acquisition;
- Type of wetland management required;
- Set-up costs;
- Habitat management and maintenance;
- Monitoring; and
- Profits/benefits foregone.

To fulfil its legal and policy goals, mitigation banking must be commercially successful. This requires creation of a viable market for the credits, generating a certain level of demand from developers that will be a function of:

- Establishing the geographic area the bank will cover ('service area')
- Overall development pressure on wetlands within the service area;

- Relative return from development;
- Likelihood of receiving a §404 permit; and
- Relative cost of mitigation credits in relation to carrying out own mitigation.

As a result of ongoing concerns over the ultimate wetland value and success of banks, it is now common practice for an MBRT to require a performance bond or endowment fund. Held in Trust until the bank is judged successful, they act as insurance against the long-term management and maintenance of the wetlands, even if the banker goes bankrupt.

(Crooks and Ledoux, 1999) and (Salzman and Ruhl, 2005) summarise the potential benefits of mitigation banking as:

- Single large sites confer advantages in maintaining ecosystem integrity;
- Wetlands implemented in advance of loss to development;
- Allows judgement of whether new wetland will be a "like for like" replacement;
- Credits are normally granted when restoration/creation judged successful;
- Provides certainty of mitigation costs to developers;
- Economies of scale mean bank provides better value than large number of smaller sites, reduces overall costs in terms of planning and implementation, and regulatory monitoring; and

- Reduce and streamlines regulatory process.

However, mitigation banking maintains and arguably exacerbates the decoupled relationship between project level mitigation and wetland loss. There is no explicit link between the conservation management objectives of the mitigation bank and the wetland functions being lost or damaged. This has contributed to considerable criticism of mitigation by several authors:

"…[the National Academy of Sciences' Committee on wetland mitigation was] *not convinced that the goal of no net loss for permitted wetlands is being met for wetland functions.*"

(National Research Council, 2001)

"*…the section 404 permitting program has been fostering an 80 percent net loss of wetlands*."

(Turner et al., 2001)

This poses serious questions as to the efficacy of the wetland mitigation banking approach. (Salzman and Ruhl, 2005) summarised the issues as relating to the inherent traits of the §404 permitting approach allowing trading in different wetland variables e.g.:

- **Type** e.g. the bank provides different ecosystem services to those lost;
- **Space** e.g. the bank does not necessarily restore wetlands in the area they were lost;

- **Time** e.g. the Corps grants permits allowing sales of bank credits before quality of the wetlands is known.

Tying the mitigation bank too closely to the wetland functions lost and their location, i.e. like-for-like within the same catchment, significantly reduces the market available to the bank and affects its underlying viability.

These problems are compounded by the discretion allowed in devising credit currencies: these range from simple and cheap methods (area-based) to more broad-based and costly methods (assessing wetland functions in detail). (Salzman and Ruhl, 2005) found that the simple methods dominate even though their limitations are widely recognised.

Finally, poor monitoring and enforcement by the Corps is resulting in little information on the overall effectiveness of mitigation banking. This is argued to be contributing to ongoing losses (see (Mbobi, 2005) and (National Research Council, 2001)) and has drawn heavy criticism from some observers e.g. see Julie Sibbing, National Wildlife Federation in (ten Kate et al., 2004). The 2001 report of the National Academy of Sciences' Committee (National Research Council, 2001) recognised this weakness and recommended the Corps implement a national database to track the wetland area and functions lost and regained. This was just being rolled out as of June 2006 (US Army Corps of Engineers, 2006).

5.2 Conservation banking under §10 of the Endangered Species Act 1973

The Endangered Species Act 1973 (**ESA**) has three fundamental goals:

- **Prevent extinction** of endangered or threatened species
- **Secure** their eventual **recovery**; and
- **Protect the ecosystems** on which they depend.

Fundamentally, it is concerned with ensuring the continued existence of species that are endangered or threatened in the United States. In crude terms, it operates a no loss approach in terms of the species itself as opposed to the individuals and overall population and range of the species (*c.f.* FCS under the Habitats Directive). Strict application of the original ESA by the Courts in respect of damaging development led to a series of amendments during the 1970s to 1990s designed to introduce greater flexibility and make socio-economic development easier in areas with endangered species.[12]

The main sections relevant to regulation of the impacts of land-use change on endangered species are summarised in Table 5 below.

[12] This has parallels with the changes introduced to the Birds Directive by the EU through Article 6(4) of the Habitats Directive that allowed socio-economic development to override the general protection afforded Natura 2000 sites. This diluted the effect of the ECJ's strict interpretation of the protective provisions of Article 4(4) of the Birds Directive in the Leybucht Dykes judgment (Case C-57/89: Commission of the European Communities vs. Federal Republic of Germany, 28 February 1991).

Table 5: Key sections of Endangered Species Act 1973 relating to regulation of land-use change (adapted from (Scott et al., 2006) and (Suckling and Taylor, 2006)

Section	Summary
7	Requires federal agencies that authorise/fund/carry out actions to consult with the US Fish and Wildlife Service (**USFWS**) to: "*…insure actions authorized, funded or carried out by them do not* ***jeopardize the continued existence*** *of any listed species or result in the destruction or* ***adverse modification*** [of critical habitat]"
9	Prohibits any **person** from **taking** or engaging in commerce in endangered species "**Person**" means individuals, businesses, federal and state agencies "**Take**" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct
10	Provides exemptions from §9 prohibitions. These include incidental take permits (**ITP**) (i.e. not the purpose of the permitted activity) allowing the development to proceed provided: 1. They were accompanied by a habitat conservation plan **(HCP)**; and 2. The incidental take would not "*…appreciably reduce the likelihood of the survival and recovery of the species in the wild*."

The scope of §7 often extends to permits issued under §404 CWA where they affect wetlands supporting endangered species. It is therefore possible for the mitigation banking and conservation banking systems to overlap.

Although "take" appears confined to direct physical harm to individuals of a species, the USFWS extend this to indirect harm to a species resulting from changes to its habitat. They interpret §9 as proscribing any "*significant habitat modification or degradation*" that "*actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding,*

feeding or sheltering" (USFWS, 2005). The courts have consistently stated the need for an ITP still requires proof that an act will actually kill or injure wildlife and does not extend to the potential for harm (Thompson Jr., 2006). This constitutes a much higher burden of proof of damage than the highly precautionary approach of Articles 6(3) and 6(4) of the Habitats Directive.

HCPs are seen as the key to the long-term protection and restoration of listed species. The precise mechanisms used in an HCP are not defined by §10 but the default model has been to establish reserves for the affected species (Thompson Jr., 2006). In contrast to the ITP test, which is restricted to land that supports the endangered species, an HCP can include land with **potential to support** the impacted species, offering the opportunity for net gain. Provided the HCP land supports the impacted species, it is also possible to manage that land for a broader set of species. In this way, HCPs provide a mechanism by which to secure broader biodiversity gain.

However, HCPs for individual developments have suffered some of the same problems and resultant criticisms (Fox et al., 2006) as individual mitigation wetlands under §404 CWA:

- They result in small, disconnected and uncoordinated reserves;
- They are expensive and time-consuming;
- No action can be taken until the ITP is applied for, resulting in delay in securing the HCP.

For these reasons, a similar banking system has developed as that for wetlands, known as "conservation banking". Starting in California in the mid-1990s, it eventually resulted in the USFWS 2003 guidelines on conservation banks (USFWS, 2003). The aim of the banks is to "mitigate" legally permitted impacts on threatened or endangered species. Conservation banks can be implemented through various means including:

- Habitat acquisition;
- Protection;
- Enhancement;
- Creation;
- Prescriptive management of habitats for specific biological characteristics.

To ensure the maintenance of ecological integrity in perpetuity, the bank must be of a sufficient size and guaranteed to be managed properly over that timescale. For this reason, the price of credits must include funding for long-term management and protection e.g. in the form of a non-wasting endowment.

As with mitigation banks under §404 CWA, experience has helped identify a series of issues a successful bank must address (summarised from (Fox et al., 2006)):

ISSUE	COMMENTS
Objectives	As a minimum to mitigate legally permissible impacts, ideally to promote species recovery
Credit type	Most banks seek to **preserve existing** habitats of specific habitats and species. This limits opportunities to promote recovery
Credit currency	Based on either **area** or **individuals or pairs** of species. Raises complex issues when credit currency different to debit currency, which requires conversion ratios to relate e.g. breeding pairs to hectares
Number of credits	Based on baseline survey of quality and extent of habitat/population
	Available credits can be increased by increasing area of bank or if population increases
	USFWS can assume management or reduce credits if bank does not meet required standards
Service area	Ideally, ties into a recovery plan for the species concerned. The boundary of the service area determines viability of bank as it dictates potential volume of trading. ITP must be within service area of bank. Service area influenced by proximity of other banks offering credits for same species
Long-term management	The bank property must be subject to an in perpetuity conservation easement before the bank is opened to business. The easement prohibits certain specified activities on the land to protect species or habitats and may be granted to third parties (Parkhurst and Shogren, 2006)
	Preferably covered by non-wasting endowment that covers annual operation of bank, including biological and administration costs. Normally derived from a portion of each credit sold
Monitoring and enforcement	Generally responsibility of USFWS. Bank likely to have advisory boards overseeing bank management

According to (Fox et al., 2006) there were only 35 official ESA conservation banks in the United States by 2005, ranging in size from 10 ha to 4,200 ha. Officially, they protected habitat for 22 threatened and endangered species,

albeit with many other species dependent on the sites. Most banks (91%) defined credits on the basis of habitat area and sold credits at a 1:1 ratio.

Creation of a viable market is considered to be reliant on robust enforcement of the ESA by the USFWS: if there is no demand for credits from developers, the associated banks will fail. Bank owners in California have criticised the USFWS for looking to drum up business to create new banks rather than directing potential credit buyers to existing banks.

(Fox et al., 2006) identify a tension between conservation banking and the aims of the ESA. They argue that conservation banks will only ever offer marginal benefits to the endangered species concern and, given that they facilitate development in sensitive areas, may imply an increased extinction risk. Conversely, banks can demonstrate that the needs of conservation and development can be integrated and so may strengthen political support for the protection of threatened and endangered species. If successful, it is argued it may encourage entrepreneurs to discover if land supports an endangered species and adopt "banking" as a commercial enterprise.

It is interesting to observe the problems associated with establishing the credit currency in relation to the debit currency. It appears the rules on this are quite rigid: once a bank has established its currency units it cannot change them. (Fox et al., 2006) use a Californian example to illustrate the point. Faced with a requirement to mitigate for the loss of breeding pairs of Californian

Gnatcatchers, the USFWS vetoed use of local conservation banks as their credits were in acres. It took intervention by the California Department of Fish and Game to resolve the impasse by establishing an "exchange rate" to allow a conversion equating breeding pairs to acres of the bank. In contrast, practice in the UK is to use a more complex hybrid currency, combining habitat, species and ecological functions to form the basis for conservation objectives.

5.3 Conclusions

It is no surprise that this brief review of the US experience shows that the regulatory response to "no net loss" policies and the resulting conservation output is dictated by the underlying primary conservation objective. This has important implications for any application in the UK of "habitat banking" mechanisms to help deliver compensatory measures under the Habitats Directive. It is apparent that although the CWA and ESA have utilised similar banking mechanisms, they have had quite different quality outputs. In part this is due to the robustness or otherwise of the regulatory control. However, it seems that banking under the ESA has much more focused ecological objectives. Even so, its focus on simply avoiding species extinction means it can limit its response to simple preservation, rather than pursue a more proactive restoration outcome as required by FCS under the Habitats Directive.

It is possible to draw a number of lessons about habitat banking from this brief review:

- It offers strong potential to create habitat in advance of development damage;
- It can create economies of scale that have benefits in both ecological terms (e.g. robust ecosystem functions and services) and commercial terms (e.g. more predictable and lower costs to provide compensation);
- To avoid loss of a valued ecological function the bank's objectives must be closely related to the ecological values lost to development;
- Devising credit currencies that best respect the ecological value to be replaced is complex. Both banking systems have settled on a simple measure to facilitate trading: area or individuals;
- Strong regulation is essential – both in terms of the permitting process and the establishment and monitoring of a 'bank'.

Certain characteristics emerge that help define a successful "habitat bank":

CHARACTERISTIC	COMMENTS
Viable service area	The service area must support sufficient development pressure relevant to the target habitat or species to generate demand for bank credits. It is also essential that this demand is generated within a reasonable timescale to make the bank viable
Number of credits	The bank must support sufficient credit units at an appropriate value to cover costs (if non-profit) or generate profit (if commercial)

CHARACTERISTIC	COMMENTS
Credit sales	The regulator has important role to play in securing sustainable supply of credit buyers: they must avoid temptation to set up new banks and cause oversupply in the market before existing ones are financially stable. This must be carried out strictly within the legal consent system i.e. must not consent otherwise illegal development
In perpetuity	Any bank must be subject to an appropriate conservation easement to guarantee it in perpetuity and be appropriately funded to guarantee against the banker going bankrupt e.g. non-wasting endowment
Monitoring and enforcement	Regulatory oversight is needed to ensure the bank is meeting its agreed ecological targets. Appropriate legal measures required to allow regulator to assume management control if banker is failing to meet agreed ecological and financial targets

6 UK experience of habitat compensation, with particular reference to the Humber estuary

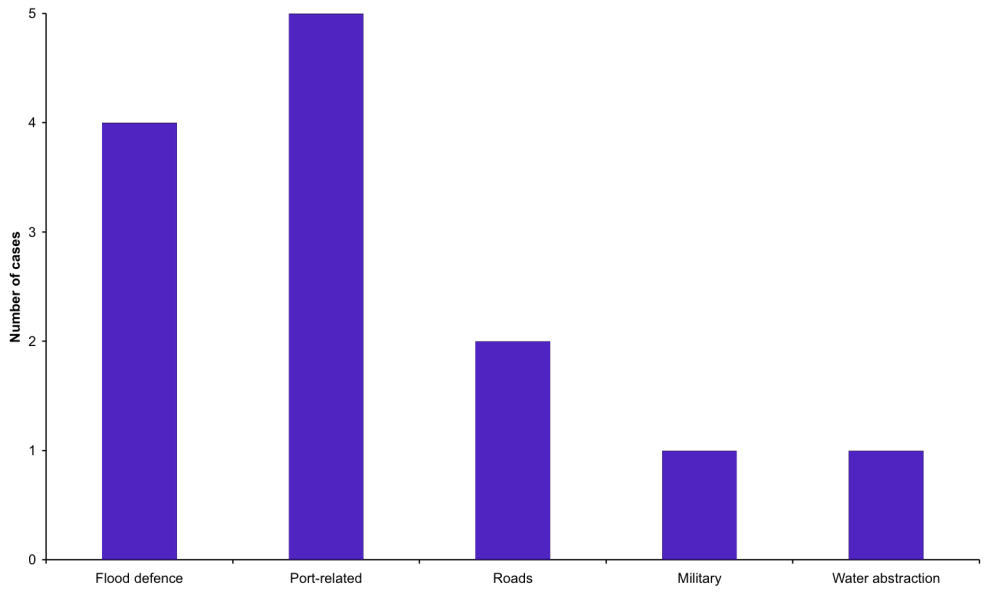
6.1 Introduction

This chapter reviews and analyses experience of compensatory measures in the UK. The study focuses on the Humber estuary as several compensation schemes have been implemented here in recent years in the ports and flood defence sectors. These can help shed light on the challenges and opportunities a more strategic approach to compensation could offer.

6.1.1 Overview of UK compensation cases

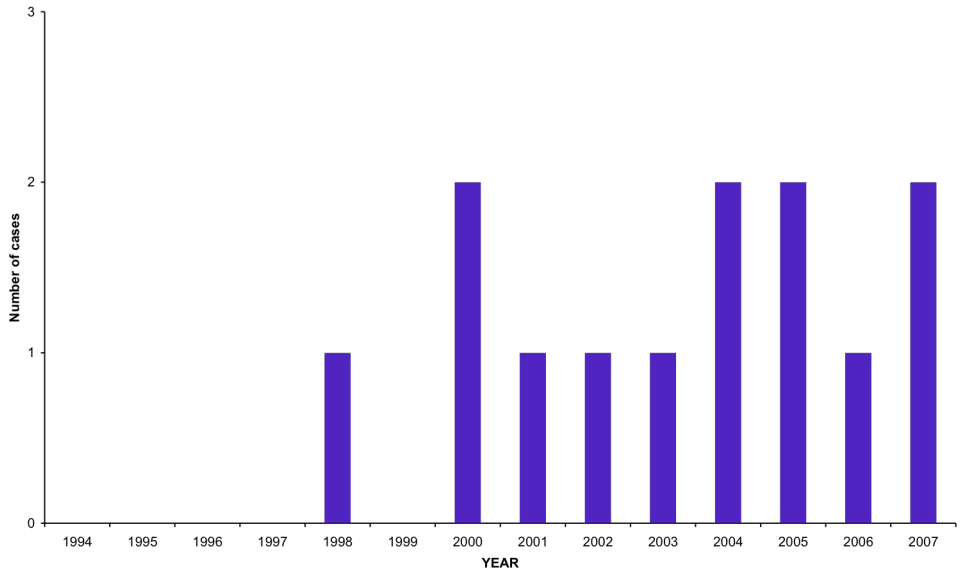
Very few cases in the UK have required compensatory measures, suggesting that implementation of Articles 6(3) and (4) in the UK is achieving its purpose of avoiding damage to Natura 2000 sites. Since 1994, just 13 cases are known to have been consented which required Article 6(4) compensatory measures. The port (5) and flood defence (4) sectors dominate (see Figure 2 below), followed by roads (2) and military and water abstraction (1 each). Three (23%) of these schemes were on the Humber estuary. Figures were derived from a recent, albeit incomplete, parliamentary answer (H M Government, 2007), supplemented by the author's professional knowledge. Details of the cases involved are summarised in Appendix 2.

Figure 2: Summary of scheme types requiring compensatory measures under Article 6(4) (based on (H M Government, 2007) and author's knowledge)



The first Article 6(4) compensation case in the UK was the Harwich Haven Channel Deepening case in 1998 (section 3.2.2.1). Since then, the Government has consented between 1-2 compensation cases in most years, averaging just under one per annum (see Figure 3).

Figure 3: Consent year of UK Article 6(4) compensation cases (based on (H M Government, 2007) and author's knowledge)



6.1.2 Background to analysis

The analysis in this chapter (sections 6.2-6.4) is based on a series of semi-structured interviews with key stakeholders involved in compensation cases on the Humber estuary, including national policy specialists. Inclusion of national policy specialists allowed for consideration of cases outside of the Humber estuary where these assisted in the analysis. Unfortunately it was not possible to obtain interviews with key staff in Defra due to time constraints.

The list of interviewees is summarised below:

Organisation	**Staff interviewed**
Associated British Ports	Senior Manager (national)
Environment Agency	Senior Manager (Humber)
Natural England	Conservation Officer (Humber)
	National policy specialist (Ports/Marine)
	National policy specialist (Planning)
North Lincolnshire Council	Environment Team (2)
RSPB	Senior Manager (national planning specialist)
	National policy specialist (Spatial plans)

A generic outline of the interview questions is summarised below:

- Views on purpose of compensatory measures under Article 6(4);
    - Approach to "overall coherence";
    - Relevance of "no net loss";
    - Relevance of factors such as ecological functions, location, timing.
- Lessons learned and problems arising from UK compensation cases;
    - Humber estuary compensation cases;
    - Other UK compensation cases where relevant.
- Implementing a strategic approach to habitat compensation;
    - Challenges in predicting impacts and relating that to compensation required;
    - Issues relating to implementing compensation measures at a strategic level through the spatial plan and flood risk management systems;

- Impact of differing plan timescales at different spatial scales;
- How is compensation "secured" at a strategic level.

The interviews are analysed in sections 6.2-6.4 below according to three main themes:

- General views on the purpose of Article 6(4) compensatory measures;
- Lessons learned from UK habitat compensation schemes, with particular reference to the Humber estuary; and
- The role of the spatial planning system and practicality of strategic habitat compensation provision.

6.1.3 Humber estuary – context

In order to understand more fully the following analysis, it is helpful to provide an outline of the Humber estuary's economic and environmental context.

6.1.3.1 Location

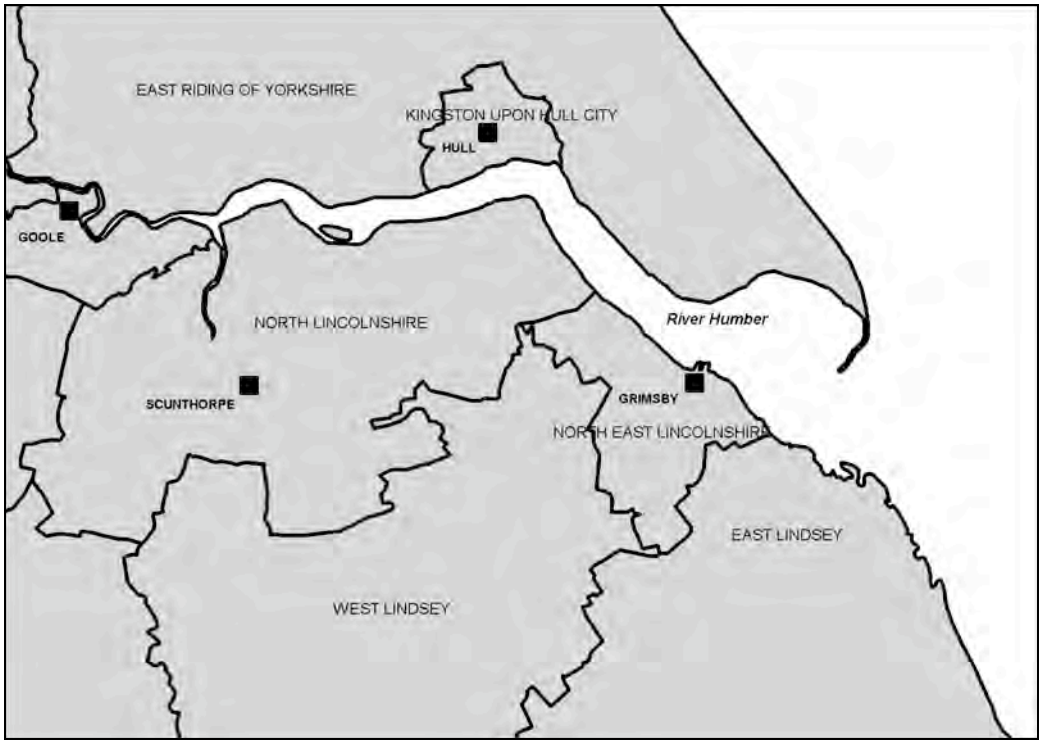
Located on the east coast of England, the Humber estuary drains approximately a fifth of England. Historic land drainage has significantly reduced the size the estuary (Morris and Barham, in press). Even so, today the estuary remains a dynamic system comprising accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. It supports a full range of saline

conditions from open coast to the limit of saline intrusion on the tidal rivers Ouse and Trent (English Nature, 2004d).

6.1.3.2 Economic importance

A combination of a deep-water channel that skirts close to the north and south banks, and the estuary's central east coast position has resulted in the development of a thriving ports sector and associated industries. The Hull and Humber Ports City Region (Hull City Council et al., 2005) comprises major ports at Grimsby, Immingham and Goole (south bank) and Hull (north bank): the Port of Immingham has the largest throughput of any UK port. High quality road and rail connections make the Humber an internationally important transport and trading gateway on an axis extending from Ireland, the west coast of England, the Midlands and northern England to north-west Europe and beyond – placing it on Priority Axis 26 of the EU's Trans European Transport Network (European Commission, 2005).

Figure 4: Location map of Humber estuary showing main towns and administrative boundaries

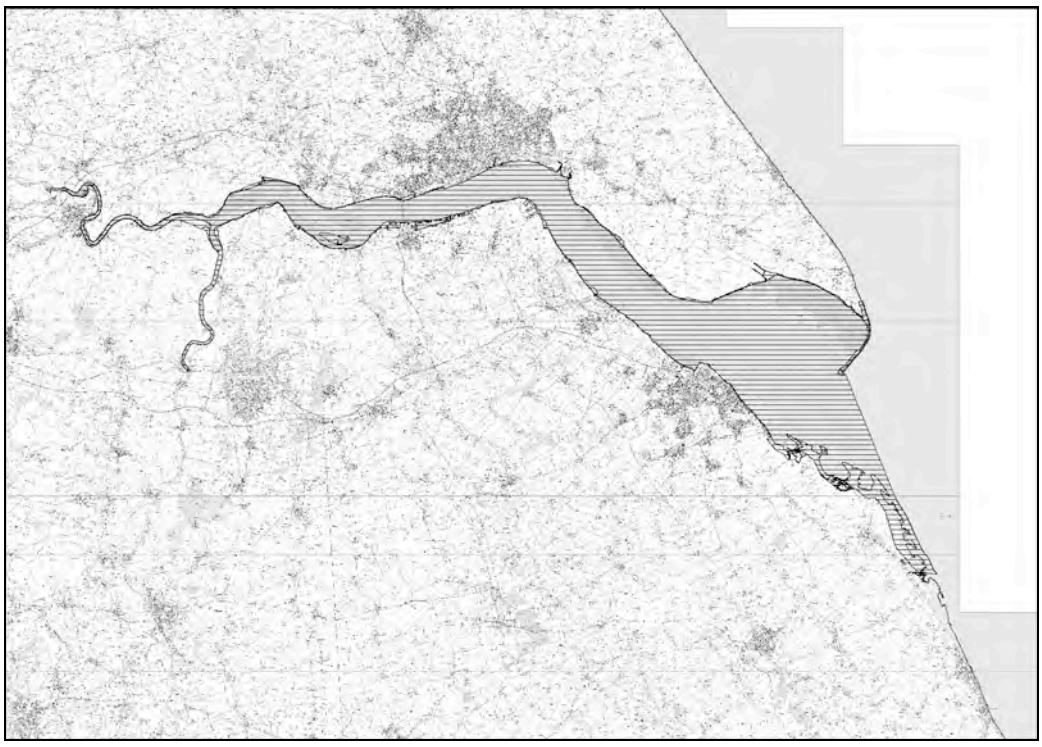


6.1.3.3 Wildlife importance

The estuary is also of international importance for its range of subtidal and intertidal habitats and the wildlife they support, including over 150,000 wintering and passage waterfowl, breeding colony of grey seals, river and sea lamprey populations. This has been recognised in its partial designation as an SPA since 1994, and its proposed extension in 2004 (English Nature, 2004b), its proposal as a candidate SAC (English Nature, 2004a) and listing as a Ramsar site in 1994 with extension proposed in 2004 (English Nature, 2004c). The

Humber SSSI underpins the SPA and SAC and is designated for a wider range of other wildlife interests, including nationally important assemblages of vascular plants, invertebrates and breeding birds (English Nature, 2004d). The sites are similar in extent (around 37-38,000 ha). The boundaries of the proposed SPA and SAC together with their citations are provided in Appendix 3.

Figure 5: Humber Estuary SSSI boundary



6.1.3.4 Habitat compensation schemes

The juxtaposition of internationally important economic and internationally important wildlife assets has inevitably led to competition for space. The main

conflicts have been between the Natura 2000 sites and the ports industry. On two occasions this has led to the need for habitat compensation.

Table 6: Humber port schemes and compensatory measures

Scheme	**Compensatory measures**
Immingham Outer Harbour (**IOH**)	Combined compensation through managed realignment schemes at: - Welwick (north bank) and - Chowder Ness (south bank)
Hull Harbour Revision Order (**Quay 2005**)	

The other area of potential conflict is with flood risk management. The Humber's flood defence system protects over 90,000 ha of land of which 85% is high quality farmland and in which over 300,000 people live or work in the main towns and cities (Environment Agency, 2005b). Maintaining these defences has occasionally resulted in damage to the Natura 2000 sites.

In 2001, improvements to the flood defences on the south bank, approximately between Grimsby and Killingholme[13], and at Paull on the north bank, resulted in damage requiring compensation. A managed realignment compensation scheme was provided at Paull Holme Strays to address the damage from these schemes and predicted additional losses from coastal squeeze (Environment Agency, 2002).

[13] The official location is described as from the SCM Jetty to East of Oldfleet drain.

Figure 6: Managed realignment at Paull Holme Strays, Humber Estuary

Lastly, a major managed realignment scheme was recently created at Alkborough on the south bank of the Humber. This forms the first of several compensation schemes to be provided over the next 50 years as part of the Environment Agency's HFRMS (Environment Agency, 2005b), a 100-year strategy to implement the Humber Estuary SMP which outlined "*…a major programme of improvement works to counter the effects of sea level rise and ensure appropriate standards of protection are maintained*". Using the findings of the Humber Estuary Coastal Habitat Management Plan (**CHaMP**)(Environment Agency, 2005a), the HFRMS identifies the need to compensate for the loss of around 700 ha of intertidal habitats from the Humber Estuary SPA and SAC over the next 50 years: 600 ha due to coastal squeeze and

the remainder due to direct loss or disturbance from repair or improvement works.

Table 7: Humber flood risk management and compensatory measures

Scheme	Compensatory measures
Urgent Works 1 & 15-17 (UW15-17)[14]	Paull Holme Strays (north bank)
Humber Flood Risk Management Strategy	Alkborough (south bank)

A map showing the location of each of these port and flood defence schemes and their associated compensatory measures is provided in Appendix 4.

6.2 Purposes of, and approach to, Article 6(4) compensatory measures – analysis

There was a general consensus among all interviewees over the purpose of compensatory measures in securing the overall coherence of the Natura 2000 network, preferably through directly addressing damage at a site level. The parameters set out in section 3.3 provide a fair reflection of those interviewees considered necessary to ensure a robust compensation scheme was implemented.

There was common agreement that the ideal standard was to provide fully functioning habitat as close as practicable to the damage and, critically, before that damage occurred. All interviewees expected compensation sites to be designated as Natura 2000 sites in due course as part of maintaining network coherence.

[14] This is the more accepted and understood name for the "Humber Estuary flood management scheme" listed in the Government's parliamentary answer in Appendix 2.

6.2.1 Key issues

Within this general consensus, a couple of key issues emerged that require further consideration at this stage:

- Compensatory measures in dynamic habitats; and
- Risk in relation to timing of compensation measures.

6.2.1.1 Compensatory measures in dynamic habitats

Concerns were expressed by the Environment Agency, Natural England and ABP over the difficulty faced in attempting to prescribe compensation outcomes that may prove unsustainable in dynamic habitats such as estuaries. All accepted that a "like for like" starting point was necessary in determining site selection and design. However, this may prove unsustainable in relation to the long-term management of an estuarine system such as the Humber where managed realignment schemes were favouring saltmarsh formation, yet recent compensation schemes required creation of intertidal mudflats. This raises a number of important interrelated issues:

- **The influence of the site boundary**: Natura 2000 site boundaries in the UK have traditionally been drawn tightly around surviving semi-natural habitat. This is a reflection of:

- Site selection guidelines which, in general, assess what is present on a site rather than its potential to achieve FCS (e.g. see (NCC, 1989) and (Stroud et al., 2001));
- A traditional assumption that all designated sites were in a favourable condition at designation;
- The implications of the legal obligations that site designation places on owners, occupiers and public bodies in relation to the management and protection of Natura 2000 sites;

- **The approach to setting site conservation objectives**: the UK approach to establishing site conservation objectives is based on the Common Standards Monitoring approach for SSSIs (JNCC, 2004). The starting point of this guidance is the assumption that designated sites were in "favourable condition" at the time they were selected;
- **A purposive approach to the role of Natura 2000 sites and FCS:** as outlined in section 3.1, the Natura 2000 network is a key mechanism in achieving FCS. This requires a critical assessment and understanding of FCS for relevant species and habitats at national level, and the contribution required of the Natura 2000 network. Very little progress has been made in the UK on this issue;
- **Understanding the underlying structures and functions necessary to maintain long-term resilience**: current understanding of the inherent

structures and functions necessary for long-term resilience of dynamic habitats is insufficient to base reliable judgements on the impacts of their loss and how they would be compensated. A more conservative approach, defined by what is **known** to be damaged is more appropriate

This combination of issues creates tensions in a dynamic system deficient in a key habitat component, such as saltmarsh, due to historic land-use changes that pre-date designation. It is arguable that in certain circumstances the framework for defining FCS can become constrained by the site boundary, posing significant challenges in establishing achievable FCS objectives within the designated site. This can have knock-on effects when defining the scope of compensation measures, as it tends to favour what exists over what might be more sustainable in terms of long-term management. The general conclusion of interviewees was that without significant changes in the approach to boundary definition and/or a better understanding of FCS at site level, the current "like for like" approach was the best and safest starting point to ensure legal compliance with Article 6(4).

6.2.1.2 Risk in relation to timing of compensation measures

The other key issue that arose related to risk, and specifically the issue of timing of compensatory measures. All interviewees concurred that the current project level approach inevitably resulted in compensatory measures being implemented either at the same time or after damage to the Natura 2000 site. The need for a system that facilitated advanced provision of compensatory measures was

identified by all as the key means of removing this risk element, provided it was clearly linked to predicted damage that met the Article 6(4) tests. There was no clear agreement on a mechanism to achieve this. This will form part of the discussion in section 6.4 and chapter 7 below.

It was noteworthy that ABP was a strong advocate of this approach. They perceived clear commercial and environmental advantage: the latter in terms of benefits in terms of securing a better environmental outcome for the estuary. Commercial benefits arose from reducing compensation related costs during the project consenting process when:

- Suitable and available locations are constrained, resulting in higher land acquisition costs; and
- Time delays and cost increases resulting from the need to obtain additional consents for compensation schemes within a sensible commercial timeframe. They commented that 45% of the £3.5 million costs to implement the compensation schemes at Welwick and Chowder Ness was taken up by the impact assessment and consent process. ABP felt that a more strategic approach could help reduce these costs substantially.

6.3 Lessons learned from UK habitat compensation schemes - analysis

The checklist of parameters set out in section 3.3 formed the basis of discussion with interviewees to highlight key lessons learned from UK habitat compensation schemes. The Humber estuary compensation schemes outlined

above formed the main focus of discussion, supplemented where necessary by reference to other important compensation schemes, especially those for the Harwich Channel Deepening, London Gateway Harbour Empowerment Order and Bathside Bay Container Terminal (see Appendix 2).

Discussions on historic cases highlighted several key issues relevant to consideration of compensatory measures at a more strategic scale. These were:

- Effectiveness;
- Location;
- Timing;
- Need for a strategic approach;
- Stakeholder confidence.

6.3.1 Effectiveness

6.3.1.1 Impact prediction

Sound, scientifically robust impact prediction was considered by all to be key to ensuring the ecological parameters for compensatory measures could be understood and agreed by decision-makers and key stakeholders. At the same time, it was important to understand the limitations of the hydrodynamic modelling used to predict the impacts of reclamation and dredging of intertidal and subtidal habitats. This was an area where confidence, knowledge and

understanding among stakeholders had continued to increase. ABP noted that the considerable caution and scepticism exercised by the environmental bodies in early schemes had been replaced by a greater appreciation of the appropriate application of model predictions. This comment was supported by the RSPB and Natural England.

The London Gateway case exemplifies this, where using hydrodynamic modelling and a risk-based approach, a worse-case scenario was used to reach agreement between P&O[15] (the developers), Natural England, the Environment Agency and the RSPB on the nature and magnitude of the predicted adverse effects (*pers. obs.*). This helped provided the parameters for two compensatory realignment sites (see (P&O et al., 2003)and (Morris and Gibson, 2007)).

6.3.1.2 Like for like and functional approach

The tension between the desire to create like for like habitat compensation and habitat creation in a dynamic environment has been highlighted in section 6.2.1.1. This emerged as a theme in respect of guaranteeing compensation effectiveness in a dynamic estuary like the Humber, where important steps to increase the success of habitat compensation had been taken by more tightly defining the "service areas" operating within the estuary. Natural England and ABP highlighted the important foundation laid by early modelling work to support the Environment Agency's Humber SMP, which divided the estuary

[15] The Peninsular and Oriental Steam Navigation Company

into three functional units based on geomorphological and ecological characteristics: inner, middle and outer. These units then provided the basis for decisions on the area of search for habitat losses within the functional unit, whether from port or flood defence works.

Notwithstanding this approach, it was noted that the models had proven somewhat inaccurate in predicting the speed at which the Humber compensation sites would evolve: all had exhibited more rapid accretion than predicted which would inevitably reduce the lifetime of the intertidal mudflats required.

This raises the issue of what level of intervention is appropriate to retain the desired habitat where this is unsustainable over the long-term. For the reasons set out in section 6.2.1.1, it was accepted that at this point in time it was not advisable to move away from the "like for like" approach to conservation objectives. There was general consensus that in dynamic environments like the Humber, intensive intervention to remediate sites to hold them in a particular condition was inappropriate, unlikely to succeed and likely to cause damage itself.

The role of advanced, strategic provision of compensatory habitat was seen as a positive approach. It was felt that provision of fewer larger sites in appropriate locations could provide a more diverse system, more resilient to change, that better maintained ecosystem integrity. Alkborough was cited as a good example of this approach. It was considered larger sites in suitable locations would be

better able to provide the right conditions for the relevant species and habitats over longer timescales, than the smaller sites such as Welwick and Chowder Ness.

This would also reduce the reliance on the precautionary approach inherent in decisions on the appropriate level of compensation required for an agreed impact. ABP expressed the view that there was a sharp difference in the levels of confidence between impact predictions and compensation success. In ABP's view this manifested itself in a very science-led approach to impact prediction, but a more risk-based and precautionary approach to the compensatory response. Advanced provision of habitat could reduce this area of uncertainty.

6.3.2 Location

Minimising the distance between the location of damage and the compensation scheme is a key element in reducing risk. As noted in chapter 3, the UK approach is to locate compensation adjacent to the damaged site where possible. As distance from the location of damage increases, the rule of thumb is to increase the area of new habitat required to offset the increased difficulty in addressing the species and habitats affected. For example, a ratio of 2:1 was used in the compensation scheme for the Bathside Bay Container Terminal (near Harwich), in part because of the distance of the compensation scheme from the damage and the fact that it was located adjacent to a different Natura 2000 site (*pers. obs.* and (Harwich International Port Limited et al., 2004)).

All stakeholders interviewed considered the functional approach adopted in the Humber estuary extremely constructive and essential to reducing risk. It helped ensure the search for compensation sites made geomorphological and ecological sense. For those bodies required to provide compensation e.g. Environment Agency and ABP, it provided a practical framework within which to narrow down the search for potential sites that would have the best chance of meeting the "like for like" standard. As a consequence, Natural England and the RSPB could be more confident about the success of compensation sites located within the same functional unit as a damaging scheme. Even so, in order to provide compensation schemes that would provide the right conditions to deliver species level objectives, ABP ended up providing two geographically separated sites at Welwick and Chowder Ness, as no single site was available that met all the requirements.

The experience of ABP in having to create two smaller sites rather than one larger site is, in part, a function of the time constraints imposed by the project level approach. Most interviewees expressed the view that a strategic approach to the provision of compensation sites in advance of damage could help secure larger, optimally located sites.

6.3.3 Timing

There was universal agreement that, with the exception of Alkborough, the timing of all compensation schemes on the Humber in relation to damage had

been poor in conservation terms: all had become operational at the time of damage or after. Fully functional compensation schemes were likely to take a further 5-10 years to develop, as emphasised by (Dodd, 2006). This was a function of the project level approach. It was also heavily influenced by the historic lack of Government policy guidance on compensation timing. Alkborough in contrast had been designed to compensate for future predicted losses to coastal squeeze.

All interviewees argued that the need to remove time-lags between damage and the provision of fully functional compensation should be a primary aim of future compensation schemes to increase confidence in ecological outcomes. This was the most frequent reason given in support of implementing a strategic approach to habitat compensation. The RSPB made a pertinent point that continuing to rely on project level delivery of compensation would mean the majority of risk continued to be borne by nature conservation: the aim should be to find a mechanism to reduce risk across the board.

In addition to this benefit, both ABP and the Environment Agency considered it would help reduce acquisition costs in two ways: (i) by reducing the "ransom" element both had experienced in land purchase negotiations at project level e.g. Paull Holme Strays and Chowder Ness; and (ii) reducing the area of land needed so that is was closer to 1:1 ratios due to increased confidence that objectives had been met.

6.3.4 Need for a strategic and advanced approach to compensation

The need for a strategic and advance approach arose in relation to several key compensation parameters. The common threads to each of these is the desire to improve confidence in the conservation outcome, increase certainty for industry and reduce risk. Risk is addressed in three main areas:

- **Effectiveness** of habitat creation through creation of larger, more robust sites;
- **Locating** habitat compensation in the most suitable location to provide fully functional habitat; and
- **Timing** the delivery of habitat compensation so that it is fully functioning before damage.

Optimising the location and timing of habitat compensation contributed to securing its effectiveness in conservation terms. Establishing a strategic approach to the identification of compensatory requirements should, theoretically, facilitate the advance provision of compensation through, for example:

- Identification of range of suitable locations;
- Acquisition and assembly of land can be more measured, reducing the intense pressure evident at the project level.

This is the approach being taken by the Environment Agency in the HFRMS, already partially implemented at Alkborough. Using earlier studies, the Environment Agency identified a list of around 30 potentially suitable managed realignment compensation sites. Applying criteria such as costs, habitat potential, physical constraints, combined with feedback from public consultation, this list was reduced to around 12 possible sites. Following further public consultation this was reduced further to the final 6 key sites. Factors such as landowner attitude and complexity of land assembly were important factors in this final short listing.

The Environment Agency and Natural England led scheme at Alkborough also offers another potential insight into future possibilities for the strategic provision of habitat compensation. One of the partners, ABP, owns land within the managed realignment scheme and has reached a time-limited agreement[16] with English Nature that suitable habitat within Alkborough could be used as compensation for future damaging developments at the port of Goole, subject to satisfying the Article 6(3) and 6(4) tests (Morris and Barham, in press). This ad hoc arrangement is probably one of the first, if not the first, examples of "banking" in the UK. It is unlikely to occur again in this way owing to the circumstances at Alkborough where a commercial interest owned land essential

[16] The agreement will expire after c15 years if ABP do not require compensation land

to the scheme. However, it does illustrate the potential exists for a "banking" approach given the right conditions: section 7.3 considers this further.

Figure 7: Strategic compensation provision for coastal squeeze, Alkborough

6.3.5 Stakeholder confidence

Various authors and commentators (e.g. (Huggett, 2003), (Morris and Barham, in press), (Morris and Gibson, 2007) and (Dodd, 2007)) have already outlined the important shift in attitudes and working relationships between the UK ports and nature conservation sectors over the last 15-20 years. Highly adversarial in the late 1980s/early 1990s, it is now generally held to be positive, professional and aiming to work with the grain of the Habitats Directive, shaped by a series of key port-related cases since the late 1990s.

Disputes over the very existence of adverse effects have been replaced with constructive discussions over the nature and magnitude of those effects and the appropriate methods to mitigate and/or compensate for them. The negotiating process and resultant legal agreements have been critical in building trust between developers, decision-makers and nature conservation bodies.

The legal agreements have also played an important part in reducing the perceived risk for all stakeholders involved in compensation schemes. For nature conservation bodies and decision-makers they set out the required ecological standards of compensatory measures accompanied by legal guarantees that those standards will be met. For developers, firm temporal and financial boundaries are placed on their legal responsibilities.

All interviewees commented on the importance of this constructive approach at the Humber estuary level. They highlighted the vital role of key individuals within the various organisations over time and at key moments in the negotiating process. An underlying element contributing to the changes observed appears to be the transparent way in which those individuals presented the culture, philosophy and objectives of their respective organisations to secure practical solutions.

6.4 Role of the spatial planning system and practicalities of strategic habitat compensation provision - analysis

The third theme of the interviews centred on the practicalities of implementing strategic provision of habitat compensation within the current spatial planning system. As noted in section 3.2.1.1, the EC's 2007 guidance rejected "habitat banking" as of limited value due to the tight criteria of Article 6(4). However, it failed to consider it in the context of a spatial planning system which had been subject to Article 6(4). The following brief analysis looks first at the role of the spatial planning system, and then at some of the practicalities of advanced compensation delivery.

6.4.1 Role of the spatial planning system

Two key themes emerged from the discussion on the role of spatial plans: (i) predicting impacts on Natura 2000 sites; and (ii) how spatial plans could and should respond to any compensatory measures that arise from those impacts.

6.4.1.1 Predicting impacts

There is an inevitable trade-off in the level of precision possible on impact prediction when moving from the project level to the strategic level. Available data on the location and type of land-use change is, in general, less precise and results in broader brush predictions on the nature and magnitude of any impacts arising from policies or proposals contained in a plan. As set out in Table 4 above, this "imprecision" increases the more removed the spatial plan is from

the project level and has implications for how each spatial level deals with the issue of compensation.

Most interviewees accepted that this broader brush approach to impact prediction was unavoidable, particularly at the higher spatial scales. At the DPD level, the RSPB argued that, in principle, it should be practicable to make reasonably precise impact assessments, as greater spatial information would be available, commissioning additional survey work if necessary. This approach was supported by Natural England in the context of the "front loaded" evidence based approach to DPD preparation required by DCLG and the Planning Inspectorate.

Using the Humber as an example, it is helpful to differentiate between the different types of Natura 2000 impact the spatial plan system will need to address. As outlined in section 6.1.3 above, two sectors have given rise to compensation schemes on the Humber: ports and flood risk management.

The HFRMS is the Environment Agency's tool for predicting and responding to the long-term and highly dispersed effects of coastal squeeze around the Humber Estuary Natura 2000 sites. Natural England and the RSPB accepted that it was appropriate to use the predicted general loss of intertidal habitats to coastal squeeze as a measure of impact, within defined functional units of the estuary, as it is not possible to be more spatially precise.

By contrast, it is the role of DPDs such as those for NLC or its neighbour, North East Lincolnshire Council, to assess the localised impacts of specific port developments promoted in support of economic development objectives. In an estuarine context, like the Humber, the RSPB, Natural England and NLC considered it should prove possible to predict the general site-specific impacts of a port allocation with more precision than is possible for the effects of coastal squeeze, using a combination of habitat information, combined with knowledge of wintering and passage waterbird data from national surveys.[17]

The RSPB expressed the view that this approach would act to reduce the level of uncertainty inherited from the higher regional levels and provide sufficient information to establish parameters for compensatory measures at the project level. They and Natural England suggested project level AA should refine the DPD AA's findings. A similar logic could be applied to the localised effects of implementing the flood defence schemes contained in the HFRMS.

This suggests that, in principle, the spatial plan system, specifically the DPD level, should be capable of identifying impacts of site allocations on Natura 2000 sites with sufficient precision to scope compensatory measures. However,

[17] The Wetland Bird Survey, co-ordinated by the British Trust for Ornithology, monitors non-breeding waterbirds (waders and wildfowl) in the UK. It covers around 2,000 wetland sites of all habitats, especially estuaries and large still waters. Monthly co-ordinated counts are made and the principal months of data collection are from September to March.

the lower level of precision clearly carries with it a level of risk that impacts may have been under or over-estimated.

6.4.1.2 The response to a compensation need

Table 4 in section 4.2.3 identifies the DPD level as the key in identifying and scoping out the parameters for compensation arising from damaging proposals or allocations. In discussion, interviewees agreed with this approach on the basis that it was only at this level that sufficient detail on impacts would be available.

The RSPB's guidance on the AA of spatial plans (Dodd et al., 2007) proposes two possible responses from a LPA to a compensation need, both of which were discussed:

- A policy, linked to the relevant allocation, setting out the various parameters a compensation scheme should meet at the planning application stage;
- As above but linked to a specific allocation (within the relevant DPD) of suitable land for the compensation measures.

The discussion with interviewees drew a distinction between the two roles a DPD can play in respect of compensatory measures:

- Arising from proposals within the DPD itself; and
- Those arising from another land-use plan such as a flood risk management strategy.

To ensure a DPD is judged sound following examination by an Inspector, an LPA will have to address compensatory measure to comply with §85E of the Amendment Regulations 2007. All interviewees supported the idea of DPDs including compensation policies and allocations, linked to the relevant development policy. Even the relatively simple step of including a policy as suggested by the RSPB is not yet accepted by LPAs. NLC's Environment Team had promoted the concept of a linked allocation to their Development Plans team. However, that team was unprepared even to include a simple policy referring to the issue. This may be indicative of a poor appreciation of the importance to plan soundness of demonstrating a damaging allocation can be implemented: the Inspectorate clearly place the onus on LPAs to show a submitted DPD has met the legal requirements (see page 5, (Planning Inspectorate, 2007b)).

Using the HFRMS as an example, all interviewees considered a DPD had an important role to play in safeguarding compensation land required by the Environment Agency. In the HFRMS, this amounts to around 700 ha over 50 years within 6 proposed managed realignment sites within 3 out of 5 LPAs bordering the Humber. Although no interviewee identified which DPD such allocations should appear in, the strategic importance of such sites suggests the Core Strategy would be most appropriate (in line with advice in paragraph 5.2 of (Planning Inspectorate, 2007b).

Safeguarding compensation land through site allocations raises a few issues relating to its long-term effectiveness:

- **Impact on land prices**: long-term safeguarding raises issues of blight as it would, subject to a material change in circumstances, deny the landowner any opportunity to develop the land.
- **Safeguarding is not full protection**: safeguarding land does not prevent a damaging development getting consent on the proposed compensation land, provided it can be justified as an exception to the spatial plan. The protective status of such sites is considered in more detail in section 7.4.
- **Area of search**: a functional approach, as used in the Humber CHaMP, will greatly assist the search for potential compensation sites. On large sites, it is probable that they will fall outside a LPA's area, as happened with both UW15-17 and IOH/Quay 2005. A Joint DPD with the relevant LPA may be the best solution to comply with §85E. This is considered in section 7.2.2.2.

6.4.2 The practicalities of advanced compensation delivery

The acid test of whether a more strategic approach to habitat compensation works is whether it can facilitate the delivery of fully functioning habitat compensation before the predicted damage occurs. This next section considers the views expressed by the interviewees on some of the practical issues involved.

6.4.2.1 Will a strategic approach facilitate advanced delivery?

An LPA's spatial plan can only go as far as identifying potentially suitable compensation land: it cannot acquire the land, obtain consent and implement the compensation. Discussion on this point revealed a key distinction in the policy frameworks governing flood risk management and commercial development schemes such as ports.

The SMP and HFRMS process anticipates long-term damage and aims to put measures in place to compensate before the damage occurs. Defra approval of the HFRMS is essentially acceptance of the Article 6(4) IROPI case to maintain defences and approval for the compensation schemes to go ahead. In principle, this gives the green light for the Environment Agency to proceed with implementing the compensation schemes. The main role of the spatial planning system is to safeguard the compensation land identified. It is then up to the Environment Agency to implement its strategy (see Figure 8).

Figure 8: The HFRMS and the Environment Agency budgetary process

Defra has recently approved a £300 million funding package to the Environment Agency for the HFRMS over 25-years. Money is to be drawn down as needed from the Agency's annual block grant of £5-600 million.

The Agency's annual budgeting process requires each scheme to demonstrate it is of sufficient importance to justify approval of the budget. Although approval of the HFRMS confers an internal advantage, it does not guarantee success given the vagaries of annual spending priorities e.g. responding to recent urban flooding events. Nor does the annualised nature of this process make it easy to plan ahead. This may compromise the ability to seize opportunities for land purchase in pursuit of specific compensation sites.

The Environment Agency is moving to a 3-yearly budget process, which should provide greater certainty that the long-term elements of the HFRMS can be delivered. Given the long lead-in times for some of the compensation sites and the timescales involved in land assembly, it may be necessary to explore longer term funding mechanisms.

In contrast, the current policy framework for ports requires a further round of consents and justification at the project level. It is only at this stage that a port developer is likely to have the commercial confidence to implement a compensation scheme. So, while the spatial plan system theoretically offers the potential to identify compensation requirements in advance, there is a systemic block to its early delivery.

ABP confirmed this situation and expressed frustration, as the company was very supportive of advanced land purchase and implementation of compensation

for both environmental and commercial reasons (see section 6.2.1.2). It had already purchased land on a south coast site for this reason, but was not willing to invest in habitat creation at that site without guarantees of consent for related port development. No obvious mechanism to overcome this problem was suggested by any interviewee, suggesting there is a significant problem with the current system. This issue is returned to in sections 7.2-7.3.

6.4.2.2 Land acquisition

One of the key benefits identified by both the Environment Agency and ABP in a strategic approach to compensation was the potential to reduce scheme costs, especially of land acquisition (e.g. see section 6.2.1.2). The ability to plan land purchases in advance and take opportunities as they arose reduced the acute "ransom value" negotiations both had experienced in compensation schemes on the Humber.

However, discussion revealed some obvious complexities:

- **Safeguarding land**: identifying suitable compensation land in spatial plans could act to either increase or decrease land values, depending on current landowner expectations;
- **Landowner aspiration**: much of the land around the Humber is high quality farmland managed by committed farmers. The Environment Agency emphasised the importance of being able to offer land swaps to such owners as a means of persuading them to sell to suitable compensation land;

- **Unwillingness to sell**: a landowner's refusal to sell cannot be overcome by a commercial developer except in very limited circumstances[18]. However, the Environment Agency does have compulsory purchase powers. It had consistently signalled its willingness to use compulsory purchase as a last resort, albeit only in cases where the land was demonstrably essential to implement a compensation scheme. This was not their preferred route but they considered the structured and reasoned consultation process over potential sites and their route to final site selection provided the foundation for a potential compulsory purchase order.

For any system of advanced compensation provision to be viable, it will need to address these issues.

[18] For example, establishment of a new harbour authority, such as London Gateway, using a Harbour Empowerment Order under the Harbours Act 1964 enables the use of compulsory purchase.

7 Discussion

Based on the preceding analysis, there appear to be some obstacles to achieving the Government's policy of providing fully functional habitat before damage, despite the willingness of most key stakeholders to see it succeed. The following discussion addresses four questions with the intention of crystallising some of the issues Government will need to address to enable its policy to be implemented.

7.1 What is the Article 6(4) compensation "market" in England?

The need to pass the strict tests on IROPI restricts the habitat compensation market in the UK to a few key sectors. Section 6.1 showed that the most consistent sectors requiring compensation in the UK are flood risk management and ports. It is helpful to consider the nature of the compensation market in each sector.

7.1.1 Flood risk management

A joint Defra/Environment Agency report reveals the potential scale of habitat compensation requirements arising from flood risk management in England (Risk & Policy Analysts Ltd. et al., 2006). The report assesses the costs of flood management work over the next 100 years to meet key coastal requirements in respect of Natura 2000 sites and the Defra public service agreement to bring 95% of SSSIs into favourable condition.

Although the work was carried out at a high level with generic assumptions, it provides an indicator of the potential scale of losses of Natura 2000 site habitats in England. The report predicts major losses of fresh and brackish water habitats (32,300 ha) and saltmarsh (4,400 ha) – summarised in Table 8, with a detailed breakdown of saltmarsh loss in Appendix 5. Most estuaries in eastern and southern England are predicted to lose most, if not all, their saltmarsh.[19] To take account of the propensity of compensatory managed realignment sites to convert to intertidal mudflats, the report suggests it may be necessary to double the saltmarsh figure to 8,800 ha.

It seems clear that there will be a strong demand for habitat compensation arising in the flood risk management sector, but it will depend on a fully implemented SMP and FRMS programme to a more precise estimate of the compensation requirements.

[19] Only three estuaries are predicted to gain saltmarsh - the Humber, the Wash and the Swale.

Table 8: Predicted losses of coastal habitats over next 100 years to 2105 (adapted from (Risk & Policy Analysts Ltd. et al., 2006)

HABITAT	PREDICTED LOSS (ha)
Fresh and brackish water	**32,300**[20]
Inland water bodies and lagoons	2,400
Wet grassland	15,000
Drier grassland	700
Bogs, marshes and fens	14,000
Saltmarsh[21]	**4,400**

7.1.2 Ports

The market-led nature of port development makes it difficult to predict future compensation needs. Based on historic cases it is likely to be relatively small scale and highly localised. Table 9 below summarises the predicted losses and resulting compensation schemes from the four historic port compensation cases.

[20] This is the area provided in Table 2.4 of (Risk and Policy Analysts Ltd. et al., 2004), but is 200 ha greater than the sum of the component habitats.

[21] The figures for saltmarsh should be taken as indicative only due to the interpolation from historical data required.

Table 9: Habitat loss and compensation area of historic port cases

PORT SCHEME	PREDICTED LOSS	COMPENSATION AREA
Harwich Channel Deepening	16.5[22]	16.5
Immingham Outer Harbour	22	50
Quay 2005[23]	4	6
London Gateway	69	74
Bathside Bay Container Terminal	69	147
TOTAL	169	293.5

Notes:
The information provided in this table was obtained from the following documents:
Harwich Channel Deepening: DETR decision letter (DETR, 1998)
Immingham Outer Harbour and Quay 2005: Compensation Agreement October 2003 (Associated British Ports et al., 2003)
London Gateway: Mitigation, Compensation and Monitoring Agreement August 2003 (P&O et al., 2003)
Bathside Bay Container Terminal: Deed relating to Compensation, Mitigation and Monitoring (Harwich International Port Limited et al., 2004)

Compared to the flood risk management sector, ports give rise to relatively small scale and localised compensation needs. Only two SPAs (the Humber Estuary and the Stour and Orwell Estuaries) have required more than one compensation scheme.

Ports of the importance likely to justify the need for compensation measures are thinly spread around the English coast, given that the Government has indicated that even "very significant" enhancement of the socio-economic and economic

[22] This is derived from figures for the compensation scheme set out in the DETR decision letter (DETR 1998) and comprises 4ha of immediate loss and a further 12.5 ha of interim losses while a sediment replacement programme was implemented. It is not clear from the decision letter and accompanying papers exactly how the 12.5 ha figure is arrived at, so it is assumed it is set at a ratio of 1:1.
[23] The 6 ha compensation for Quay 2005 was provided at the one of the sites used for compensation for Immingham Outer Harbour.

interests of a sub-region would not constitute an IROPI (see paragraph 76 of (Department for Transport, 2005)). Given the scarcity of port developments resulting in compensatory requirements (five in 13 years) and the constraints placed on the service area by Article 6(4), it seems unlikely that the port sector alone could create a viable market in advanced compensation provision. This suggests that a "banking" approach based solely on the port sector will not be possible. Possible options to secure advanced provision of habitat compensation in the ports sector are discussed in section 7.2-7.3 below.

7.2 What is the role of the spatial plan system?

Section 6.4.1.2, described two main roles for the spatial plan system in relation to habitat compensation:

- Safeguarding compensation land identified by the Environment Agency as necessary to implement a FRMS; and
- Secure compensatory measures arising from proposals within the spatial plan system itself, with particular reference to DPDs.

7.2.1 Safeguarding Environment Agency compensation land

Using a DPD to safeguard potential compensation sites identified in a flood risk management strategy is possible. However, a flood risk management strategy works on a 100-year basis with an outline strategy for 50 years. This poses immediate problems for a DPD document with a typical lifetime of around 10

years (see Table 3 above). Fortunately, PPS11 and PPS12 allow RSSs and DPDs to cater for longer time periods if the issue requires. In the context of flood risk management strategies dealing with the impacts of sea level rise and climate change on Natura 2000 sites, this appears to justify an exception to the normal time horizon.

7.2.2 Securing compensation measures arising from proposals within the spatial plan

Section 6.4.1.2 suggested that a DPD could adopt compensation policies and allocations linked to development policies. There were a number of unresolved issues, which included:

- Clarifying the legal responsibility for securing compensatory measures under §85E of the Amendment Regulations 2007;
- Securing compensation measures outside a LPA's administrative boundary;
- The systems failure preventing a port company implementing compensation in advance of damage.

7.2.2.1 Legal responsibility for securing compensatory measures

The Amendment Regulations 2007 state at §85E that: "…*the* ***Secretary of State****…shall secure any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.*" (emphasis added) (The Stationery Office, 2007).

Draft DCLG guidance interprets this as requiring LPAs to implement the compensation measures and in so doing, fails to distinguish between the separate legal responsibility on a LPA to adopt a DPD compliant with Article 6(4) and that on a private developer to provide habitat compensation in accordance with Article 6(4). There is no explanation given as to why the Government is ignoring its "polluter pays" policy (H M Government, 2005) by requiring LPAs to implement habitat compensation that should be implemented by private developers.

DCLG has provided no guidance on the minimum standard that would comply with the requirement on an LPA to "secure" the necessary compensatory measures. For the purposes of this study, it is assumed that allocation of a suitable compensation site within the DPD is the approach that optimises the chance of fully functional habitat being provided advance of damage as required by Circular 06/2005.

Using this scenario, it is helpful to consider what powers the Secretary of State has to ensure a DPD adopts an optimal policy framework to secure compensatory measures. Under the 2004 Act, the Secretary of State has two reserve powers to intervene:

- **§21 - DPD content**: where he thinks a DPD is unsatisfactory for any reason he may direct the LPA to modify it; or

- **§27 - DPD preparation**: where a LPA fail or omit to do anything necessary in connection with the preparation, review or adoption of a DPD.

The combination of these powers should be sufficient to ensure LPA compliance with §85E, provided the relevant Government Office maintains sufficient oversight. Without this, there are no obvious checks and balances within the DPD process, aside from objections by organisations such as Natural England or the RSPB. While the Planning Inspectorate is responsible for holding the public examination into a DPD, and issue reports binding on the LPA, its role is limited to testing the soundness of a DPD under §20(5): it is not responsible for checking legal compliance with the Amendment Regulations 2007 (Planning Inspectorate, 2007a).

This suggests there is a need for clear guidance from DCLG as to the standard required of spatial plans to comply with §85E.

7.2.2.2 Securing compensation outside a LPA's administrative boundary

On large Natura 2000 sites it is probable that the search for the most suitable compensation sites will extend outside a LPA's boundary. As noted in section 6.4.1.2, where a LPA will rely on a compensation site outside its boundary a joint DPD is likely to be required. However, unless this need is anticipated from the outset, it could cause substantial delays in the DPD timetable and incur substantial financial penalties, with reduction in Planning Delivery Grant and

Comprehensive Performance Assessment. Fear of such penalties may act as a disincentive to pursue joint DPDs.

In this context, it is unhelpful that DCLG's guidance is silent on the potential need for joint DPDs to address this issue. Where there is a need for a joint DPD but one or all of the necessary LPAs refuses to participate, it is not certain that the powers under either §21 or §27 of the 2004 Act enable the Secretary of State to require a joint DPD be produced. §21 relates to the content of a specific DPD so would not be relevant. It is arguable whether §27 could be applied as it relates to failures in connection with DPD preparation. There is no explicit power available to the Secretary of State to require a joint DPD in order to ensure compliance with §85E of the Amendment Regulations 2007.

7.2.2.3 Policy system failure preventing a port company implementing compensation in advance of damage

Section 6.4.2.1 identified a systemic block in the spatial planning system that would act to dissuade port developers from implementing compensation in advance of damage: they are unprepared to do so without guarantees they will obtain consent.

However, there are more fundamental problems than this. Although section 6.4.1.1 suggested that a front loaded spatial plan system should be able to predict the impacts of allocations with sufficient precision to scope

compensatory measures, the current ports policy framework and ports market act to compromise:

- The ability of the spatial plan system to identify future port growth with reasonable certainty and predict its impacts;
- To judge whether the likely damage can pass the tests on alternative solutions and IROPI; and
- To do so in a timeframe that enables advance compensation to be implemented in accordance with Circular 06/2005.

These problems derive from the structure of the Government's ports policy. It has long been Government policy to adopt a market-led approach to the provision of additional port capacity, an approach strongly supported by the industry (for example, see evidence of UK Major Ports Group and British Ports Association in (HoC Transport Committee, 2007). This has been reiterated most recently in the Government's interim report on the ongoing Ports Policy Review (Department for Transport, 2007). The reality of this reactive, relatively short-term operating environment was reinforced in the interview with ABP. Despite corporate forward planning, they argued the timing and nature of specific projects was highly reliant on seizing short-term opportunities presented by the market.

The Government's interim report talks up the role of regional and local spatial planning authorities, in conjunction with the industry, in planning the location of

new port capacity, aided by non-statutory medium-term[24], port master plans.[25] ABP saw little likelihood that either spatial plans or master plans would prove useful in predicting the Natura 2000 impacts of port growth, other than in a very general way. The main reason for their scepticism was that both statutory and non-statutory plans could not reflect the detail of short-term investment decisions of the market. This lack of detail at the spatial plan stage is critical in that it undermines the ability of a planning authority (and Government) to determine whether a particular type of port development can pass the strict Article 6(4) alternative solutions and IROPI tests and therefore require compensatory measures.

As currently constructed, the Government's ports policy framework does not appear to be compatible with the spatial planning system's requirement to predict with reasonable certainty the location, and resultant impacts, of new port development. Ultimately, this affects the ability of spatial plans to provide a framework that enables the ports industry to implement compensation in advance of damage. It is likely to perpetuate a project-led approach to compensation provision that all those interviewed for this study considered unsatisfactory and which fails to meet Government policy.

[24] Suggested to be 10 years

[25] The Interim Report on the Ports Policy Review provides no guidance on the structure or contents of ports master plans nor, given their non-statutory status, whether they would be subject to Articles 6(3) and 6(4) of the Habitats Directive.

This exposes a serious weakness in the UK spatial framework in respect of assessing the impact of port development at the DPD level, and raises serious questions as to the degree to which the current spatial plan system and its policy environment can address the compensatory needs of the port sector.

It strongly suggests a different approach is required: this is explored further in section 7.3 below.

7.3 Possible mechanisms to deliver advanced compensatory measures

Sections 6.4.2.1 identified the need for a mechanism that bridged the gap between the spatial plan and the planning application such that port developers were willing to implement advanced delivery of habitat compensation. The main blockages to achieving this are:

- The inability of the current spatial plan system to identify the compensatory needs of the port sector;
- The resultant temporal disconnect between the need to provide advanced habitat compensation and the ability to identify need for compensation within the ports sector; and
- Lack of a mechanism that can provide suitable habitat compensation in advance of a specific compensation need.

In the absence of a Government ports policy framework that is highly spatially prescriptive towards the nature and location of future port development, it is

necessary to consider whether any solution is available that will help address the following requirements:

- Provide a good ecological match between predicted damage and advance compensatory measures in the right location and at the right time;
- Remove or substantially reduce the risks associated with project-level compensatory measures e.g. habitat equivalence, location, time-lags;
- Ensure a proper Article 6(4) audit trail between compensatory measures and damaging project;
- Ensure there is no unintended incentive to grant consent for damaging projects that would not otherwise obtain consent;

A possible solution could be found in the main UK compensation market: the Environment Agency's need to provide substantial compensation in advance of the loss of coastal habitats to sea level rise and climate change. Section 7.1 outlined the potential scale of this market, which at present is internal to the Environment Agency. It could offer the possibility for the development of partnership approaches, akin to that between Natural England and ABP at Alkborough.

The question is whether the Environment Agency could act as a form of compensation "banker" to facilitate the advanced provision of compensation for the ports sector? This possibility was discussed with the Environment Agency.

Their initial reaction was that it would prove difficult, especially if the Agency was required to exercise its compulsory purchase powers to implement a compensation scheme. In this situation, it is understandable that it would be unacceptable to sell compensation "credits" to a port developer, as it would undermine the argument that the land in question was essential to fulfil the Agency's obligations. Whether it could be both possible and appropriate in other circumstances is unclear without more detailed work.

This area merits further investigation to see if there is any potential to remove the structural impasse identified in respect of ports. Issues to consider in such work include:

- Which estuaries are likely to give rise to compensation needs for both sectors and offer the potential for partnership approaches?
- What is the likely scale and location of Environment Agency compensation schemes in those estuaries, and how well does this relate to port location?
- Would there be sufficient "credit" in the Agency's advanced compensatory provision to meet ad hoc compensation needs arising from the ports sector? Would this be acceptable?
- At what point could a port seek to obtain "credits" from the Agency? During the project level assessment would seem appropriate, when the impacts are clear and scope of compensation required is known;

- If a banking approach were feasible, how would the credit currency be set? Is it possible to devise a credit unit that reflects the more complex mix of habitats, species and ecological functions required by the Habitats Directive?
- At what rate should compensation "credits" be sold to the port sector, taking in to account the need to make up resultant shortfalls in the Agency's own delivery?
- An alternative option could be to utilise intertidal habitat created to meet the Agency's High Level Target to create at least 100 ha of saltmarsh or mudflat per annum (DEFRA, 2005). Would this be acceptable in policy terms?
- What safeguards are required to ensure the requirements of Article 6(4) are met e.g. full and transparent accountability to ensure replacement of the ecological functions lost to port development? These would have to address the criteria of a successful conservation bank set out in sections 5.2 and 5.3.

Further investigation may show this approach to be unfeasible for a range of legal, policy and practical reasons. However, the US experience of conservation banking suggests hybrid public and private systems are possible. The UK benefits from the fact that Article 6(4) provides a strong regulatory framework and robust quality controls that would address some of the potential weaknesses associated with conservation banking. Any possible system would need to be rigorously audited against those requirements.

7.4 The designation "Catch 22"

The ultimate aim of compensatory habitat is that it meets its ecological objective to restore the coherence of the Natura 2000 network and is designated as part of that network. However, before this, a compensation site is in a state of "protective limbo": it has no protected status under the Habitats Directive and is vulnerable to damage without any requirement to compensate for its loss. Added to this is the problem highlighted in section 6.4.1.2 that compensation land safeguarded in spatial plans lacks total protection from damaging development.

There is a related point that could act further to dissuade developers from implementing advance provision of compensation. If habitat compensation is implemented so that it is fully functional before damage, then it is likely to fall within the protective ambit of Articles 6(3) and 6(4): either because it has been designated or that it is treated as if it is in accordance with Government policy.[26] As such it could not then be used as compensation because it was protected.

This gives rise to an apparent "Catch 22": leaving advance compensation land (implemented or unimplemented) unprotected makes it vulnerable to damage without compensation, while protecting it dissuades private developers from implementing it.

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[26] See paragraphs 3-5 of Circular 06/2005 (ODPM, 2005a)

A possible solution is for Government formally to extend the current policy protection it affords to potential SPAs and SACs to land clearly identified as necessary to provide habitat compensation under Article 6(4). Such land will need to have been subject to a formal decision-making process, at either the spatial plan or project level scale, tying it in to a specified development justified under Article 6(4). This could provide proper protection while enabling a developer to implement the compensation. This, of course, depends on having a system to deliver advanced compensation provision.

If a solution based on that suggested in section 7.3 proves feasible, the Environment Agency will, from time to time, act as some form of "banker" using its own compensation land, which should benefit from the same policy protection suggested above. A policy framework would need to be devised to avoid eventual Natura 2000 designation fossilising the "bank" and preventing credits being sold post-designation. Alternatively, formal designation could be suspended for a set number of years after the compensation land has matured.

8 Conclusion

This study has sought to assess whether the spatial plan system can implement the requirement for habitat compensation under Article 6(4) of the Habitats Directive, with particular reference to England. To better secure the overall coherence of the Natura 2000 network and meet Government policy on the timing of compensation, there was general consensus among the stakeholders interviewed that implementing a system of strategic, advanced provision of habitat compensation in the UK is essential. Theoretically, this should remove or substantially reduce the risks observed at project level associated with ecological function, location and timing of compensation.

Analysis of historic compensation cases confirms that the compensation market is highly restricted, and dominated by two sectors with predominantly coastal locations: flood risk management and ports. This gives rise to similar habitat compensation requirements.

Government policy emphasises the importance of both sectors to the spatial planning system in England. However, detailed analysis has exposed various shortcomings in the current policy and legal framework that may act to undermine the ability of the spatial plan system to implement the Article 6(4) habitat compensation requirement.

8.1 Spatial plans and the compensation market

8.1.1 Flood risk management

The need to address the long-term impacts of climate change and sea level rise means there will be a large-scale and widespread demand for habitat compensation in England arising in the flood risk management sector. The Environment Agency and other flood risk management authorities will need to address this through a SMP and FRMS system that has been subject to Articles 6(3) and 6(4) and has identified suitable compensation sites. However, they will rely on the spatial plan system to safeguard these sites pending their implementation over the next 50-100 years. Government guidance provides sufficient flexibility to allow RSSs and DPDs to cope with these timescales.

8.1.2 The ports sector

Analysis of historic cases suggests the market-led ports sector appears will give rise to a much smaller and more localised potential compensation market. In contrast with flood risk management, the spatial plan system potentially has a more direct role to play in identifying and justifying the need for compensation arising from port development. In principle, it is well set up to identify the impacts of future port development in sufficient detail to scope the compensation needs and allocate suitable sites.

However, serious weaknesses are identified in the interface between the spatial plan system and UK ports policy. These expose a disconnect between continued

Government support for a market-led port sector and the requirement for spatial plans to comply with Articles 6(3) and 6(4) of the Habitats Directive and the Government's own policy on fully functioning compensation before damage.

If the market-led approach persists, it is not clear whether the spatial plan system can play a strong role in addressing the compensation needs of the port sector. In the absence of a new approach, the port sector will revert to a project-led compensation system that all stakeholders interviewed considered unsatisfactory and potentially non-compliant with Government policy.

A possible solution is proposed, linking the Environment Agency's strategic programme for large-scale and long-term compensation of coastal habitats in most southern and eastern England estuaries with the ad-hoc compensation requirements of the port sector in some of those same estuaries. This would mean that, where necessary, the Agency could act as a "compensation banker" to the port sector in those few cases the Government accepts justify damage to Natura 2000 sites in the overriding public interest.

At present, the Agency is understandably sceptical of this suggestion as there are significant legal and practical obstacles to overcome, even if it was politically acceptable. It clearly needs more detailed exploration and discussion to see if it has the potential to remove key blockages that appear to deny the port sector access to advance habitat compensation:

- An unwillingness of ports to commit to advance compensation provision in the absence of guarantees over subsequent consents for port development;
- The inability of the current ports policy framework and spatial plan system to identify the need for specific port development and the resultant compensatory needs;
- The consequent temporal disconnect between any provision of advanced habitat compensation and an identified project-level need within the ports sector;
- Lack of a mechanism that can provide suitable habitat compensation in advance of a specific compensation need.

The Environment Agency and other flood risk management authorities are about to embark on creating what is essentially a large-scale internal compensation banking system in order to meet their obligations to protect the overall coherence of Natura 2000 sites affected by flood risk management. The United States experience of conservation banking under the ESA suggests that it is possible to implement hybrid systems comprising both public and private interests. The well-rehearsed shortcomings of the American habitat banking system understandably ring alarm bells in UK conservation policy circles. In exploring the possible solution suggested above, considerable comfort should be drawn from the fact that Article 6(4) provides a strong regulatory framework

and robust quality controls that should address the potential weaknesses associated with conservation banking.

8.2 Legal and policy issues to address

This study highlighted some additional potential shortcomings in the legal and policy framework that need to be addressed to improve the ability of the spatial plan system to meet the requirements of Article 6(4) and §85E of the Amendment Regulations 2007.

8.2.1 Securing compensatory measures under §85E of the Amendment Regulations 2007

Clear guidance is needed on the minimum standard that would comply with the requirement on an LPA to "secure" the necessary compensatory measures under §85E. This study has revealed general support for an explicit policy that identifies and allocates suitable compensation land within the DPD. This would be clearly linked to the policy or allocation that will cause the damage.

Current reserve powers under the 2004 Act should be sufficient to ensure Government can secure LPA compliance with §85E, provided the relevant Government Office maintains sufficient oversight. In the absence of this, there are no obvious checks and balances within the DPD process that can secure such compliance.

Finally, draft DCLG guidance should justify its requirement that LPAs should implement compensation measures identified in their spatial plans. At present, it fails to distinguish between the separate legal responsibility on a LPA to adopt a DPD compliant with Article 6(4) and that on a private developer to provide habitat compensation in accordance with Article 6(4).

8.2.2 The "service area" and joint DPDs

On large Natura 2000 sites it is probable that the search for the most suitable compensation sites will extend outside a LPA's boundary. DCLG's guidance should advise LPAs how to address this issue and the potential use of joint DPDs. The Government should address the implications of the lack of any explicit power for the Secretary of State to require a joint DPD on its ability to secure compliance with §85E of the Amendment Regulations 2007.

8.2.3 The legal status of advance compensation land

Finally, the legal status of compensation land requires clarification in order to remove potential disincentives from providing advance habitat compensation. Although it is Government policy that compensation land should be designated as Natura 2000 when it qualifies, it currently has no legal protection. This gives rise to an apparent "Catch 22": leaving compensation land (implemented or unimplemented) unprotected makes it vulnerable to damage without compensation, while protecting it dissuades private developers from implementing it in advance.

A possible solution is for Government formally to extend the current policy protection it affords to potential SPAs and SACs to land clearly identified as necessary to provide habitat compensation under Article 6(4), provided such land is tied to an allocation or project that has been justified under Article 6(4).

8.3 Summary

The Article 6(4) compensation market in the UK is small, and largely restricted to two main sectors: ports and flood risk management. The future compensation needs of ports are likely to be relatively small, ad hoc and localised. In contrast, the flood risk management sector is predicted to give rise to large scale and widespread compensation needs as it seeks to tackle the impacts of sea level rise and coastal squeeze on coastal habitats in Natura 2000 sites.

Through wider application of the SMP and FRMS system, the Environment Agency and other flood risk management bodies should create a self-contained strategic compensation market capable of providing fully functional habitats in advance of the predicted Natura 2000 losses. Ports, in contrast, currently lack a coherent spatial system that operates on the timescales that would help them meet EC and Government policy to deliver habitat compensation in advance of damage. In the absence of such a system, potential might exist in some form of integration with the flood risk management compensation market. Further work is required to assess the feasibility of such a system.

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Appendices

1 Relevant text from the UK ECJ judgement relating to the application of Articles 6(3) and 6(4) to land-use plans in the UK

2 Summary information on Article 6(4) compensatory measures cases in the UK

3 Humber Estuary Natura 2000 sites: maps and citations

4 Map showing location Humber estuary port and flood defence schemes and associated compensation measures

5 Predicted losses of saltmarsh from SPAs in England to 2105

Appendix 1

Relevant text from the UK ECJ judgement relating to the application of Articles 6(3) and 6(4) to land-use plans in the UK

Land use plans

51. The Commission submits that United Kingdom legislation does not clearly require land use plans to be subject to appropriate assessment of their implications for SACs in accordance with Article 6(3) and (4) of the Habitats Directive.

52. According to the Commission, although land use plans do not as such authorise development and planning permission must be obtained for development projects in the normal manner, they have great influence on development decisions. Therefore land use plans must also be subject to appropriate assessment of their implications for the site concerned.

53. The United Kingdom accepts that land use plans can be considered to be 'plans and projects' for the purposes of Article 6(3) of the Habitats Directive, but it disputes that they can have a significant effect on sites protected pursuant to the directive. It submits that they do not in themselves authorise a particular programme to be carried out and that, consequently, only a subsequent consent can adversely affect such sites. It is therefore sufficient to make just that consent subject to the procedure governing plans and projects.

54. As to those submissions, the Court has already held that Article 6(3) of the Habitats Directive makes the requirement for an appropriate assessment of the implications of a plan or project conditional on there being a probability or a risk that it will have a significant effect on the site concerned. In the light, in particular, of the precautionary principle, such a risk exists if it cannot be excluded on the basis of objective information that the plan or project will have a significant effect on the site concerned (see, to this effect, Case C-127/02 Waddenvereniging and Vogelbeschermingsvereniging [2004] ECR I-7405, paragraphs 43 and 44).

55. As the Commission has rightly pointed out, section 54A of the Town and Country Planning Act 1990, which requires applications for planning permission to be determined in the light of the relevant land use plans, necessarily means that those plans may have considerable influence on development decisions and, as a result, on the sites concerned.

56. It thus follows from the foregoing that, as a result of the failure to make land use plans subject to appropriate assessment of their implications for SACs, Article 6(3) and (4) of the Habitats Directive has not been transposed sufficiently clearly and precisely into United Kingdom law and, therefore, the action brought by the Commission must be held well founded in this regard.

Appendix 2

Summary information on Article 6(4) compensatory measures cases in the UK

Appendix 2.1

House of Commons Written Answers 25 July 2007: Columns 1090-2W

Nature Conservation: EC Action

Martin Horwood: To ask the Secretary of State for Environment, Food and Rural Affairs pursuant to the answer of 17 May 2007, *Official Report,* column 887W, on nature conservation: EC action, if he will list the information on compensatory measures supplied to the European Commission as required under Article 6(4) of the Habitats Directive.

Joan Ruddock: According to our records there have been several habitat compensation schemes secured as compensatory measures, under Article 6(4) of the EU Habitats Directive. This is to ensure that the overall coherence of the Natura 2000 network is protected. These are as follows.

Project	**Year consent given**	**Type of consent**	**European site affected**
Harwich Haven to Felixstowe approach channel deepening by dredge	1998	The Coast Protection Act, 1949 and the Food and Environment Protection (FEPA) Act 1985	Stour and Orwell SPA Hamford Water SPA
A249 Iwade to Queensborough road improvement scheme	2000	Highways Act 1980	Medway Estuary and Marshes SPA
Humber Estuary flood management scheme	2001	Planning consent under the Town and Country Planning Act 1990	Humber Flats, Marshes and Coast Phase 1 SPA
Hullbridge tidal flood scheme	2003	Planning consent under the Town and Country Planning Act 1990	Crouch and Roach Estuaries SPA Essex Estuaries SPA[1]
Pett frontage tidal defence scheme	2004	Planning consent under the Town and Country Planning Act 1990	Dungeness to Pett Levels SPA Dungeness SPA[2]
Morecambe coastal defence works	2005	Planning consent under the Town and Country Planning Act 1990	Morecambe Bay SAC and SPA
Road improvement to A830 trunk road from Mallaig to Lochailort	2007	Highways Act	Glen Bleasdale SAC

[1] This is probably incorrect and should read "Essex Estuaries SAC"
[2] This is probably incorrect and should read "Dungeness SAC"

In addition, there were two consents granted subject to compensatory measures being secured as and when ongoing monitoring identified adverse effects on the European sites concerned. These are as follows:

Project	**Year consent given**	**Type of consent**	**European site affected**
MOD Remote Ammunitioning Facility in the Tamar Estuary Plymouth	2000	Planning consent under the Town and Country Planning Act 1990	Plymouth Sound and Estuaries SAC
Water abstraction at North Pickenham, Norfolk	2002	Water Resources Act 1991	Norfolk Valley Fens SAC

A review of the relevant records reveals some uncertainty as to the schemes in respect of which information has been sent to the Commission formally in accordance with Article 6(4) of the Habitats Directive. We are therefore in the process of sending them information on all those listed.

Appendix 2.2

Chronology of UK Article 6(4) compensatory measures cases by year of consent

YEAR OF CONSENT	CASE
1994	None
1995	None
1996	None
1997	None
1998	Harwich Haven to Felixstowe approach channel deepening by dredge
1999	None
2000	A249 Iwade to Queensborough road improvement scheme MOD Remote Ammunitioning Facility in the Tamar Estuary Plymouth
2001	Humber Estuary flood management scheme
2002	Water abstraction at North Pickenham, Norfolk
2003	Hullbridge tidal flood scheme
2004	Pett frontage tidal defence scheme Immingham Outer Harbour Harbour Revision Order (Humber)
2005	Morecambe coastal defence works Hull Harbour Revision Order (Quay 2005)
2006	Bathside Bay Container Terminal, Harwich
2007	Road improvement to A830 trunk road from Mallaig to Lochailort London Gateway Harbour Empowerment Order (Shellhaven, Essex)

Appendix 3

Humber Estuary Natura 2000 sites: maps and citations

Appendix 3.1

Humber Estuary proposed Special Protection Area – boundary map and citation

EC Directive 79/409 on the Conservation of Wild Birds
Special Protection Area (SPA)

Name: Humber Estuary

Unitary Authority/County: Kingston-upon-Hull, East Riding of Yorkshire, North Lincolnshire, North East Lincolnshire and Lincolnshire

Consultation proposal: The proposed extensions to the SPA encompass the adjacent wetland habitats at Saltfleetby-Theddlethorpe Dunes Site of Special Scientific Interest (SSSI), North Killingholme Haven Pits SSSI, Killingholme-Immingham foreshore, Goxhill Marsh Fields, New Holland, Barton and Barrow Clay Pits, Blacktoft Sands (Ousefleet foreshore), the Ouse, Hessle-Hull foreshore, The Lagoons SSSI, and the subtidal channel of the estuary, because of these areas' usage by the species and assemblage of European importance. The existing SPA contains all or parts of the Humber Estuary SSSI. The proposed extensions coincide with areas incorporated within the boundaries of the Humber Estuary SSSI, North Killingholme Haven Pits SSSI, Saltfleetby-Theddlethorpe Dunes SSSI and The Lagoons SSSI. The qualifying interests of the SPA have also been reviewed as part of this proposal.

Site description: The Humber Estuary is located on the east coast of England, and comprises extensive wetland and coastal habitats. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed by grazing marsh in the middle and outer estuary. On the north Lincolnshire coast, the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. Much of the estuary is owned and managed by conservation organisations. The estuary supports important numbers of waterbirds (especially geese, ducks and waders) during the migration periods and in winter. In summer, it supports important breeding populations of bittern *Botaurus stellaris*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and little tern *Sterna albifrons*.

Size of SPA: The SPA including proposed extensions covers 37,641.77 ha.

Qualifying species:
The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex 1 species	Count and season	Period	% of GB population
Avocet Recurvirostra avosetta	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern Botaurus stellaris	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier Circus cyaneus	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover Pluvialis apricaria	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit Limosa lapponica	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff Philomachus pugnax	128 individuals – passage	5 year peak mean 1996-2000	1.4%

Annex 1 species	Count and season	Period	% of GB population
Bittern Botaurus stellaris	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier Circus aeruginosus	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet Recurvirostra avosetta	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern Sterna albifrons	51 pairs – breeding	5 year mean 1998-2002	2.1%

The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	Count and season	Period	% of subspecies/population
Shelduck *Tadorna tadorna*	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot *Calidris canutus*	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin *Calidris alpina*	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank *Tringa totanus*	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *britannica*
Knot *Calidris canutus*	18,500 individuals – passage	5 year peak mean 1996 – 2000	4.1% *islandica*
Dunlin *Calidris alpina*	20,269 individuals – passage	5 year peak mean 1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank *Tringa totanus*	7,462 individuals – passage	5 year peak mean 1996 – 2000	5.7% *britannica*

Bird counts from: Wetland Bird Survey (WeBS) database and Allen *et al.* (2003).

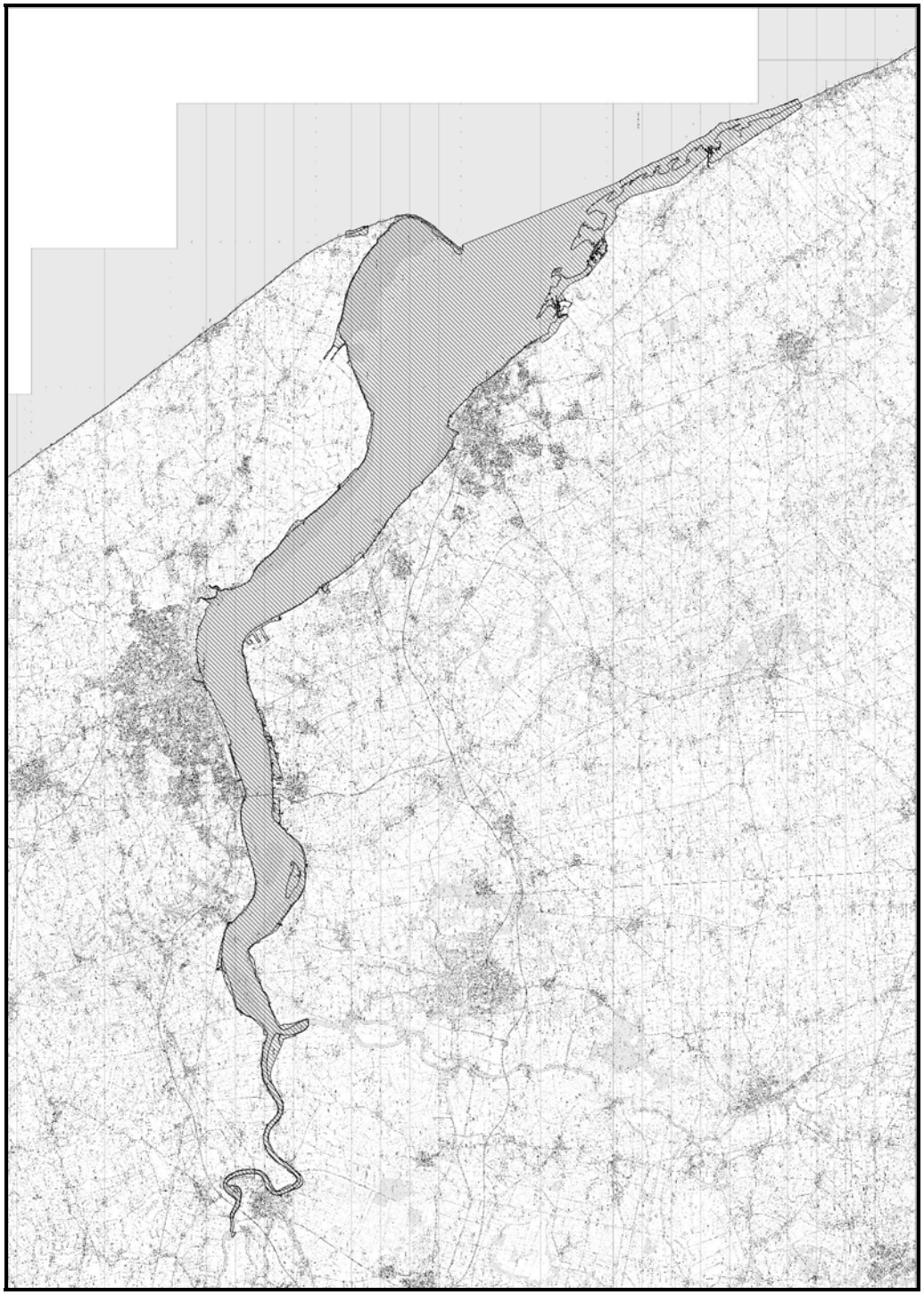
Assemblage qualification:
The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 153,934 individual waterbirds (5 year peak mean 1996/97 – 2000/01), including dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, pochard *Aythya ferina*, scaup *Aythya marila*, goldeneye *Bucephala clangula*, oystercatcher *Haematopus ostralegus*, avocet *Recurvirostra avosetta*, ringed plover *Charadrius hiaticula*, golden plover *Pluvialis apricaria*, grey plover *P. squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, sanderling *C. alba*, dunlin *C. alpina*, ruff *Philomachus pugnax*, black-tailed godwit *Limosa limosa*, bar-tailed godwit *L. lapponica*, whimbrel *Numenius phaeopus*, curlew *N. arquata*, redshank *Tringa totanus*, greenshank *T. nebularia* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA is used by non-breeding Bewick's swan *Cygnus columbianus bewickii*, whooper swan *C. cygnus*, smew *Mergellus albellus*, red-throated diver *Gavia stellata*, slavonian grebe *Podiceps auritus*, little egret *Egretta garzetta*, spoonbill *Platalea leucorodia*, merlin *Falco columbarius*, peregrine *F. peregrinus*, spotted crake *Porzana porzana*, wood sandpiper *Tringa glareola*, Mediterranean gull *Larus melanocephalus*, sandwich tern *Sterna sandvicensis*, roseate tern *S. dougallii*, common tern *S. hirundo*, arctic tern *S. paradisaea*, short-eared owl *Asio flammeus* and kingfisher *Alcedo atthis* (all species listed in Annex I of the EC Birds Directive) in numbers of less than European importance (less than 1% of the GB population). It also supports breeding common tern and kingfisher in numbers of less than European importance.

Status of SPA:
Humber Flats, Marshes and Coast (Phase 1) SPA was classified on 28 July 1994.

Boundary of Humber Estuary proposed Special Protection Area



Appendix 3.2

Humber Estuary possible Special Area of Conservation – boundary map and citation

Reasons for recommendation as a possible Special Area of Conservation

Area name: **Humber Estuary**
Administrative area: **City of Kingston upon Hull**
East Riding of Yorkshire
Lincolnshire
North East Lincolnshire
North Lincolnshire

Component SSSI: **Humber Estuary**

This area has been recommended as a possible Special Area of Conservation (SAC) because it contains habitat types and/or species which are rare or threatened within a European context. The SSSI citation describes the special interests for which the site was notified in the British context. The interests for which the site was selected as SSSI may differ from the interests selected in a European context.

The habitats and/or species for which this area has been recommended as a possible SAC are listed below. The reasons for their selection are listed, together with a brief description of the habitats and species as they typically occur across the UK. This area contains the interests described although it may not contain all the typical features.

The area is considered to have a high diversity of habitats/species of European importance.

European priority interest(s):

1. Coastal lagoons

- **for which the area is considered to support a significant presence.**

Lagoons. These are areas of shallow coastal saltwater of varying salinity separated from the sea by sandbanks, shingle or, less frequently, rocks.

2. Fixed dunes with herbaceous vegetation ("grey dunes")

- **for which the area is considered to support a significant presence.**

Dune grassland. This species-rich habitat includes a broad range of dune grasslands where the dunes are stable. The exact nature of the vegetation depends on grazing, the degree of stability, and the amount of lime in the sand. Species commonly found include sand sedge Carex arenaria, red fescue Festuca rubra, and lady's bedstraw Galium verum.

European interest(s):

3. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

- **for which the area is considered to support a significant presence.**

Atlantic salt meadows. This habitat encompasses saltmarsh vegetation containing perennial flowering plants that are regularly inundated by the sea. The species found in these saltmarshes vary according to the duration and frequency of flooding with seawater, geographical location

and grazing intensity. Salt-tolerant species, such as common saltmarsh-grass Puccinellia maritima, sea aster Aster tripolium and sea arrowgrass Triglochin maritima, are particularly characteristic of the habitat.

4. Dunes with *Hippophae rhamnoides*

- **which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.**
- **for which the area is considered to support a significant presence.**

Dunes with sea-buckthorn. Scrub vegetation on more-or-less stable sand dunes in which sea-buckthorn Hippophae rhamnoides is abundant. The sea buckthorn may either form dense thickets, or occur as more scattered bushes interspersed with various grasses and herbs. This habitat is found at scattered coastal localities around the UK, but as a native vegetation type it is confined to a few sites on the east coast of England. Elsewhere sea-buckthorn has been planted, and is generally regarded as a conservation problem as it tends to invade other sand dune habitats.

5. Embryonic shifting dunes

- **which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.**
- **for which the area is considered to support a significant presence.**

Shifting dunes. These are low dunes that develop along the upper shore above the high tide line. Only a few plant species are able to survive in these conditions, such as sand couch Elymus farctus, lyme-grass Leymus arenarius, sea sandwort Honckenya peploides and sea rocket Cakile maritima.

6. Estuaries

- **for which this is considered to be one of the best areas in the United Kingdom.**

Estuaries. These are semi-enclosed bodies of water which have a free connection with the open sea and within which the seawater is measurably diluted by freshwater from the surrounding land. They are usually large features containing a complex range of habitats that reflect the variations in tidal influence and substrate type.

7. *Halichoerus grypus*

- **for which the area is considered to support a significant presence.**

Grey seal. Grey seals spend most of the year at sea. They come ashore in the autumn to form breeding colonies on rocky shores, beaches, in caves, occasionally on sandbanks, and on small uninhabited islands. It is these breeding areas that are proposed for protection. Grey seals are among the rarest seals in the world and over 90% of the European Union population of this species breeds on the UK's coast.

8. *Lampetra fluviatilis*

- **for which the area is considered to support a significant presence.**

River lamprey. The river lamprey is a primitive, jawless fish resembling an eel. Confined to western Europe, it migrates from the sea to spawn in silt beds of many rivers in the UK. One

population in the UK is, however, known to live entirely in freshwater. The river lamprey is absent from some rivers because of pollution and barriers to migration.

9. Mudflats and sandflats not covered by seawater at low tide

- **for which this is considered to be one of the best areas in the United Kingdom.**

Intertidal mudflats and sandflats. These are mud and sand sediments on the shore that are exposed at low tide but submerged at high tide. Many sites are also important feeding areas for waders and wildfowl.

10. *Petromyzon marinus*

- **for which the area is considered to support a significant presence.**

Sea lamprey. This is a primitive, jawless fish resembling an eel. It is the largest of the lampreys found in the UK. It inhabits North Atlantic coastal waters and migrates to spawn in rivers. It has a widespread distribution within the UK, although populations have declined due to pollution and barriers to migration.

11. *Salicornia* and other annuals colonising mud and sand

- **for which the area is considered to support a significant presence.**

Glasswort and other annuals colonising mud and sand. These are areas of saltmarsh on intertidal mud and sand dominated by annual plants. The vegetation is dominated by open stands of glasswort Salicornia species or annual sea-blite Suaeda maritima. These plants often form the lowest and most seaward zone of a saltmarsh, where they are frequently flooded by the tide.

12. Sandbanks which are slightly covered by sea water all the time

- **for which the area is considered to support a significant presence.**

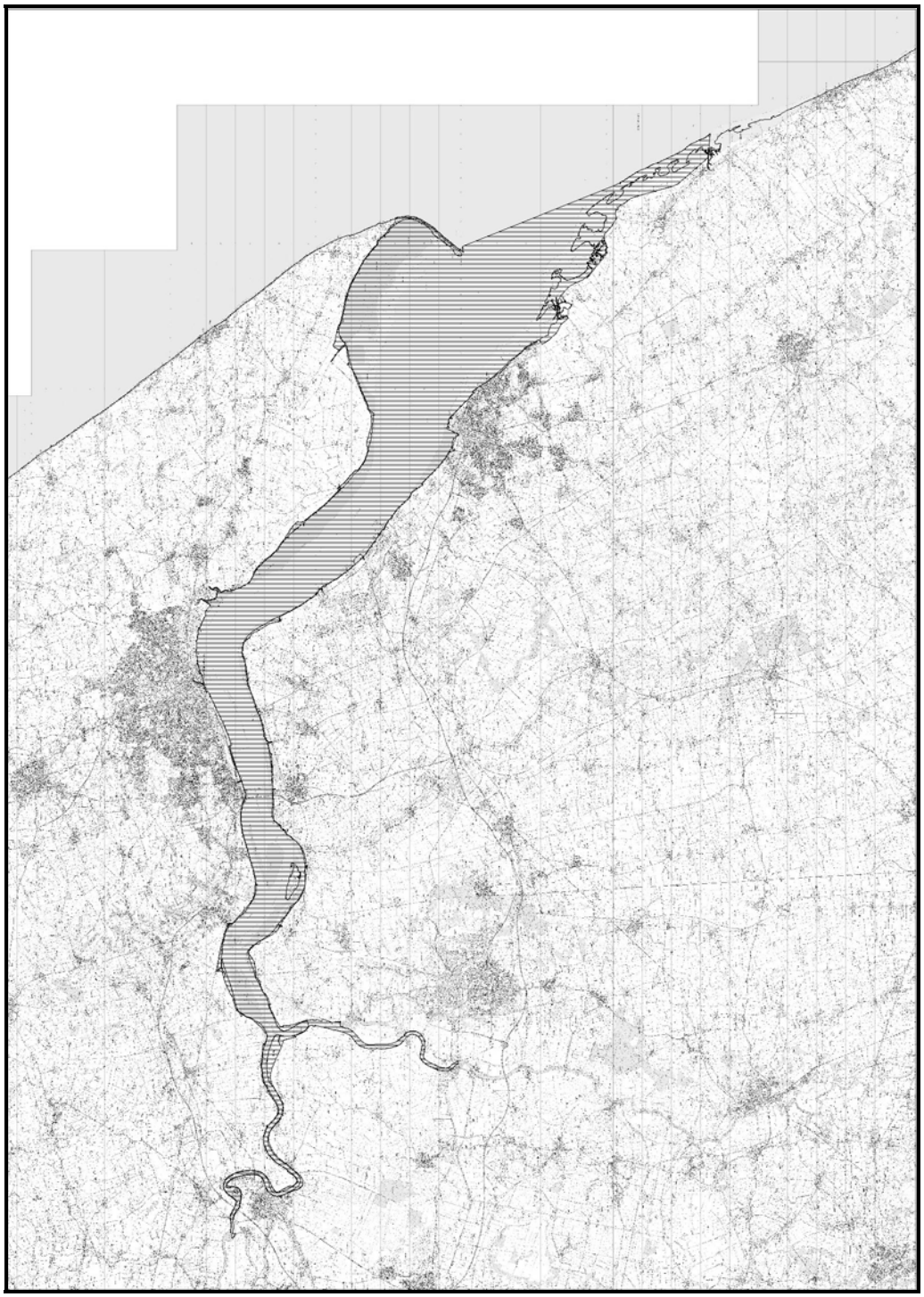
Subtidal sandbanks. Sandbanks permanently covered by sea water to depths of up to 20 metres below low water can include muddy sands, clean sands, gravelly sands, eelgrass Zostera marina beds, and maerl beds (carpets of small, unattached, calcareous seaweed).

13. Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")

- **for which the area is considered to support a significant presence.**

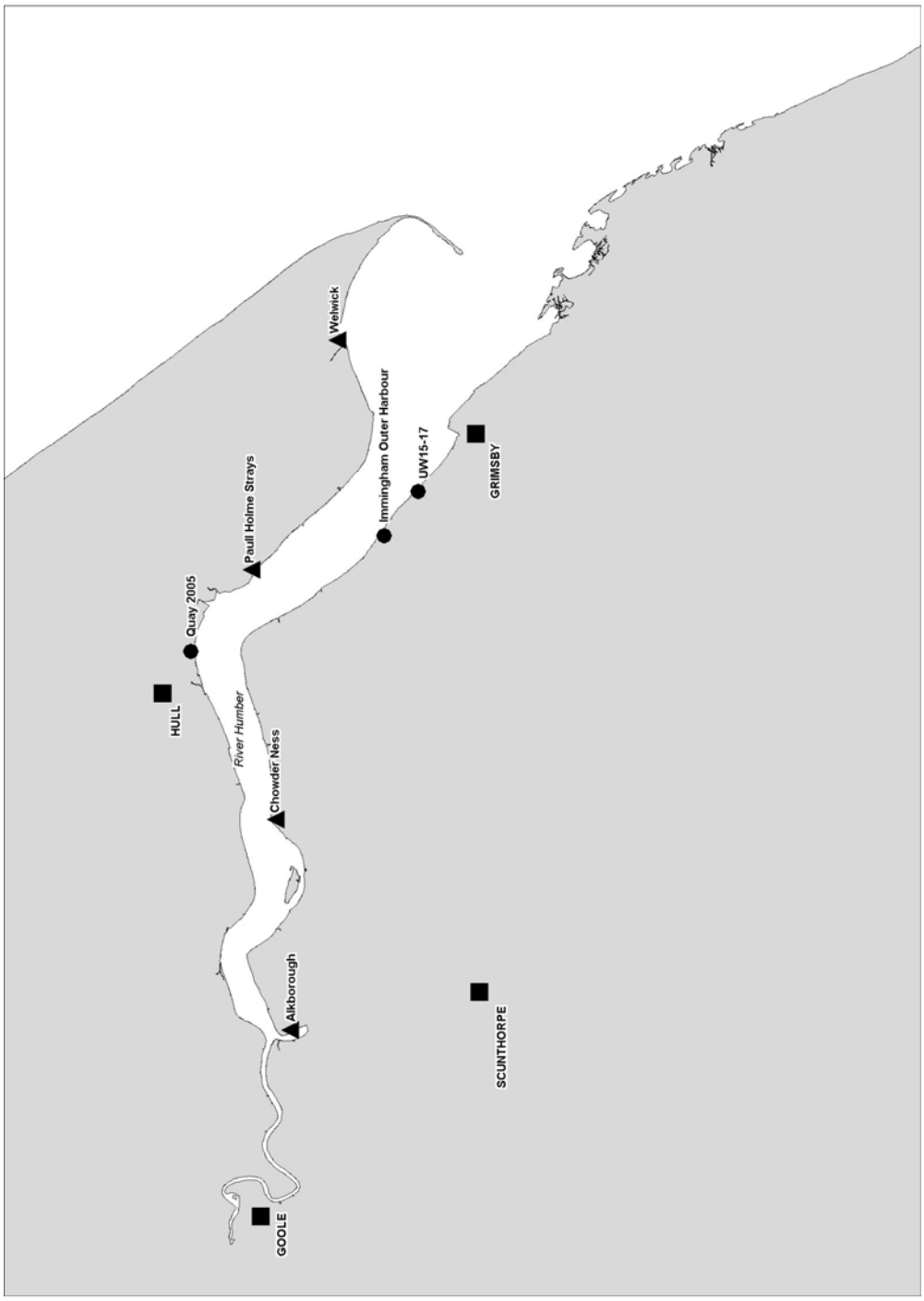
Shifting dunes with marram. These are actively-building or growing dunes, found in areas receiving large quantities of blown sand. Continual burying by sand restricts the number of plants that can survive but provides ideal conditions for the growth of sand-binding marram Ammophila arenaria. A small number of other specialised dune plants can also tolerate these conditions.

Boundary of Humber Estuary possible Special Area of Conservation



Appendix 4

Map showing location Humber estuary port and flood defence schemes and associated compensation measures



Appendix 5

Predicted losses of saltmarsh from SPAs in England to 2105

Special Protection Area	Change in saltmarsh area (ha)	Notes	Baseline year
Deben Estuary	-226.8		1998
Stour and Orwell Estuaries	-161.1		1997
Hamford Water	-614.3		1998
Colne Estuary	-602.4		1998
Blackwater Estuary	-670.2		1997
Dengie	-287.8		1998
Crouch and Roach Estuaries	-388.8		2000
Benfleet and Southend Marshes	-134.7		1998
Thames Estuary and Marshes	-30.5		2000
The Swale	134.4		2000
Chichester and Langstone Harbours	-455.1		2001
Portsmouth Harbour	-52.8		2001
Solent and Southampton Water	-448.2	Minimum	Various
Humber Estuary	840.5		1995
The Wash	4165.3		2002
Severn Estuary	-347	South shore	2000

Note: no information available for Foulness SPA

Adapted from Table 2.34 in:

RISK & POLICY ANALYSTS LTD., ROYAL HASKONING UK LTD. & ABPMER LTD. (2006) National evaluation of the costs of meeting coastal environmental requirements. DEFRA.