Broadland Environmental Services Ltd
Strategic Environmental Assessment

Environmental Objectives

May 2003

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Broadland Environmental Services Limited
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Contents Amendment Record

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Issue	Revision	Description	Date	Signed
1	0	Final	May 2003	PR

Contents

1 Vision

The Broadland grazing marshes, wetlands and fens all lie below current high tides. The riverside settlements face a future of higher sea levels with, as yet, no flood defences. Economic activity in the Broads, whether it be through agriculture, local commerce, recreational boating, fishing or rambling is heavily dependent upon reliable flood defences. The Broads Flood Alleviation Project, which is promoted by a Public-Private Partnership comprised of Broadland Environmental Services Ltd (BESL) and the Environment Agency, aims to provide such defences over a 20-year programme of comprehensive engineering works. This is the first such project of its kind in Broadland – and in the country – to provide a long-term commitment to the continuing maintenance of riverine flood defences.

The Broadland project meets rigorous environmental standards in a way that is cost effective and technically feasible. It is also a project that is subject to extensive public participation in a manner that identifies, and wherever possible and appropriate, incorporates the views and opinions of its stakeholders. Overall, the progressive implementation of the project will maintain and improve the Broadland environment for the benefit of local communities both now and into the future. The Project will implement flood defence improvements in Broadland whilst also aiming to ensure that navigation, recreational and wildlife interests are all fully protected. However it cannot do this entirely on its own. BESL must also consult widely with a range of stakeholders to ensure that the programme as a whole is sustainable both economically and environmentally and has continuing public support.

The project represents a unique opportunity to integrate flood defence work with other public interest initiatives of benefits to the Broads. The Environment Agency is actively engaged in developing partnerships with stakeholders. The delivery of partnership benefits in conjunction with improved flood defences for Broadland forms an important element of the overall vision for the Project.

The Strategic Environmental Assessment, the Environmental Standards part of which is introduced in the document that follows, subscribes to this vision.

2 Introduction

2.1 This document on the consultation framework is part of a series of reports that makes up the Strategic Environmental Assessment (SEA) on the Broadland Flood Alleviation Project. The SEA for the Broadland Flood Alleviation Project sets out environmental standards for maintenance, flood defence improvements and first-time defences at undefended communities. These standards are the long-term context for BESL's work in Broadland during the Project.

2.2 The new SEA document is comprised of six parts:

1. Environmental Objectives (**this document**);
2. Environmental Baseline;
3. Environmental Specifications;
4. Environmental Monitoring;
5. Consultation Framework and
6. Strategic Biodiversity Assessment (European sites).

2.3 Although the SEA cannot give binding commitments, it does seek to reflect stakeholder consensus. The SEA process will therefore ensure that scheme details are consistent with the agreed environmental objectives, policies and specifications.

2.4 As part of Strategy development, Broadland Environmental Services Limited (BESL) has updated the Environment Agency's 1997 Strategic Environmental Assessment. The new environmental objectives develop the cross-cutting issues that have emerged in the project area and recognise how the project interacts with a wide range of interests. The objectives have been developed from the Environment Agency's former 'environmental acceptability and enhancement criteria' and results of recent public participation. The objectives also reflect current policy and practice and issues raised by stakeholders, and the contractual framework within which BESL operates.

2.5 The new environmental objectives have taken into account:

- condition surveys
- topographic surveys
- environmental monitoring

- impact of improvement works as they are carried out
- changes in legislation and policy
- hydraulic modelling of the river system as improvements progress
- EIA and consultations

2.6 The SEA update was developed with the benefit of wide public consultation on key issues between May and July 2002. In the light of the issues raised during this 'scoping' stage, BESL developed its environmental objectives and standards to provide an updated context for the planning, design and implementation of its maintenance and improvement works. This updated work was presented to a Stakeholder Forum in February 2003. Following the Forum, further feedback was received in March 2003. Where possible, relevant stakeholder comments and suggestions were incorporated into environmental objectives and policies.

2.7 The entire process to develop and update the SEA is a dynamic one – and BESL will review its content and implementation on an annual basis. Stakeholders who have expressed an active interest in being involved in the ongoing SEA process (those attending the Forum) will be contacted for their input as required.

3 Aims

3.1 These aims were developed an agreed during the process to update and develop the SEA. They encapsulate the high-level approach to delivering sustainable flood defences. they are:

i	To improve flood defences to increase floodbanks' resistance to breach with an allowance for future bank settlement and sea level rise.
ii	To provide flood defences to undefended riverside communities.
iii	To provide sustainable flood defences that are technically feasible, cost effective, environmentally sound and socially acceptable.

4 Strategic Environmental Objectives

3.1 The environmental objectives are a public statement of the project's commitment to high environmental standards. They are in effect, BESL's environmental 'code of environmental practice' that guides the planning, design and implementation of the project's work. By having a clear set of objectives they provide a consistent approach to BESL's own work; and they provide a clear explanation to stakeholders about how BESL will go about its work. By providing clarity and certainty they should assist consultation and decision-making. The objectives are the most significant part of the SEA since they provide the operational context for the planning, design and implementation of BESL's work.

3.2 BESL's update of the new environmental objectives has been guided by a number of criteria to ensure the approach to policy development is relevant, consistent and operates at the appropriate level of detail:

- They should not duplicate statutory requirements such as Local Plan policies. Such an overlap is superfluous as compliance with statutory plans and policies is a pre-requisite;

- The project will respond to environmental changes directly attributable to the effect of works (or the combined effect of cumulative changes). Comprehensive survey and monitoring is designed to identify natural environmental processes (such as siltation and erosion in rivers) and provide the necessary baseline understanding against which to measure change;

- The strategic environmental objectives cannot be legally binding: they are an expression of the project's overall environmental response to the potential effects of its work. However, stakeholders should expect that the project will be implemented by applying these objectives;

- The objectives are not intended to be mutually exclusive. There may be occasions, however, when the most appropriate flood defence solution would comply with one objective but be in conflict with another. In such cases the reasons will be clearly explained to decision-makers and other key stakeholders when appropriate.

3.3 The new environmental objectives are accompanied by supporting text to assist with their interpretation and to provide a guide to implementation. A related series of Environmental Policy Notes has been prepared that elaborates BESL's approach to key aspects of the SEA where necessary.

STAKEHOLDER INVOLVEMENT

1 The environmental objectives, policies and specification set out in the SEA will provide the basis on which BESL's work will be designed and implemented during the Project. These environmental standards will be updated annually with key stakeholders.

The SEA is a continually evolving process that makes use of new and updated information as it becomes available. The report of the SEA is a code of practice that comprises:

- Environmental objectives
- Environmental specifications for maintenance and improvement work
- Environmental monitoring framework
- Consultation framework
- Strategic environmental baseline
- Strategic Appropriate Assessment (European sites)

SEA development will also be informed by the monitoring designed to assess the effectiveness of improvements and maintenance works as they are implemented. Annual SEA updates will be developed in consultation with stakeholders, and will also take account of changes in Government advice, legislation and statutory policy.

2 The design of individual improvement schemes will be developed in consultation with stakeholders as part of the statutory planning process.

Prior to the submission of each planning application BESL will consult all relevant stakeholders, using appropriate illustrative techniques, to help stakeholders understand the changes that can be expected from each scheme. This consultation will be in addition to the formal consultations undertaken by the local planning authority.

All landowners directly affected by individual improvement schemes, and key local statutory and non statutory stakeholders will be identified and provided with information on each scheme, detailing the preferred improvements, alternatives that have been considered and associated environmental issues and benefits. All consultees will be invited to provide feedback to BESL on the proposals.

BESL will carefully consider any comments it receives and incorporate changes where possible and appropriate. Responses from consultees will inform the scope of Environmental Impact Assessment, in cases where this is required.

MATERIAL SOURCING & REINSTATEMENT	See also Policy Note 7

3 Material will be sourced locally wherever this is possible. Where material is to be sourced from a borrow area elsewhere and imported, the proposals will be progressed in consultation with all relevant stakeholders.

The method by which material is sourced for improvement and maintenance works must be technically feasible, cost-effective, environmentally sound and acceptable to local communities. Local material sourcing will seek to ensure that it is carried out in ways that do not disrupt groundwater or the hydrology of rivers.

There will be a sequential approach to the sourcing of material which is, in order of preference:

1 Local sourcing for improvements by widening existing soke dykes (strengthening) or by constructing new soke dykes (setback);

2 Local sourcing from adjacent areas by extending existing marsh dykes adjacent to the working area;

3 Importing material from outside the working area where insufficient suitable material is available locally.

Should material sourcing proposals involve the creation of borrow pits, these will be brought forward in consultation with key stakeholders and statutory bodies on their implementation, opportunities for after-use and restoration. Suitable precautions will be taken where necessary to reduce the risk of spreading alien invasive species during material sourcing operations.

A strategic material sourcing assessment forms part of the SEA and this will be developed on a site specific basis as survey and ground investigation data is obtained.

4 Dredgings will be used for construction provided:

a) it is technically feasible and cost-effective;

b) there are no significant adverse environmental effects or impacts on communities;

c) the quality of material is suitable to meet construction needs; and

d) the timing, location and quantity of dredged material is compatible with the programme of work.

River dredgings have the potential to be used for some flood defence construction activities. Its suitability depends on the quality of the material, as well as the timing, location and quantity of availability in relation to the programme of works. Concerns about possible adverse environmental effects of dredging means that large scale dredging as a major source of material is unlikely to take place.

While river dredgings have little value in building floodbanks, they may be suitable in limited quantities as infill behind piling, or in for building new ronds. Care must be taken to ensure that indiscriminate use of dredgings on new ronds does not suppress the reestablishment of reed and floral diversity.

BESL will continue to work closely with the Broads Authority to assess where the need to dispose of dredgings is compatible with BESL's work programme and material requirements.

AGRICULTURE AND LANDOWNERS

5 Landowner approval will be sought early in the development of flood defence proposals.

The agreement of landowners is vital to the success of the project. BESL will undertake a thorough consultation exercise during the planning of all flood defence improvement works and this shall properly include all landowners individually, and relevant stakeholders. The project will not be able to provide the desired level of improvements without landowner consensus.

6 Flood defence improvements must not have a significant adverse effect on the operation of local businesses.

BESL recognises that the local economy is largely dependant on small businesses, such as boatyards, holiday accommodation, public houses and farms. Consequently, they will be properly included within the consultation exercise and as far as practicable, adverse effects will be avoided through the design and planning of the improvements. Short term disruption is inevitable in the vicinity of construction works. Such works however, will be planned with due regard to local business and appropriate measures introduced to mitigate any adverse effects. Access to properties and land for owners and the public will be maintained while improvement works are undertaken.

7 Reinstatement of all working areas to at least their former condition will take place following the completion of improvement and maintenance works.

The majority of construction works are on agricultural land. Once works are completed the land will be reinstated to at least its former condition and will be carried out in a way that is compatible with the location, use and habitat type that existed prior to the works. On new ronds for example, there is the opportunity to enhance habitats typically by establishing a mosaic of reed-dominated vegetation communities.

Reinstatement will mainly be in locations where there have been temporary site compounds, access tracks, haul routes and within working areas generally where construction vehicles have been operating. Re-instatement will involve measures to avoid or reduce excessive soil compaction and will encourage healthy vegetation to re-establish. Re-vegetation will take place during the first available growing season. This will usually be by re-seeding using an appropriate and approved native grass seed mix, or by allowing natural colonisation. Topsoil and grass seed mix will always be applied to floodbanks to minimise soil loss and contribute to bank stability. Should re-vegetation not be successful, alternative restoration measures will be taken.

Where trees have been allowed to grow on floodbanks and they need to be removed to enable work to take place, they will not be replaced. Trees and scrub provide habitat for certain animal species and their removal will take account of statutory limitations or requirements that apply.

8 Where new haul routes or access tracks are created within working areas, the land will be restored to its former condition following completion of the works.

Where new haul routes are created for construction purposes these will normally be removed and the land restored to its former condition. Access routes to be retained for operational purposes, e.g. to provide future access for survey, maintenance or for agriculture (and usually located behind the floodbank on the folding) will be designed as ‘green tracks’: a hardcore base covered by topsoil and either seeded or allowed to regenerate naturally as grassland. These will be identified early in the planning and design process.

Impacts on soil structure and after-use will be minimised by a variety of techniques including use of vehicles with low pressure bearing tyres, temporary reinforcement and protection of subsoil.

WATER LEVELS AND WATER QUALITY	See also Policy Note 5

9 The project must not result in significant change in river water levels.

BESL will programme its works in such a way as to avoid significant effects on upstream and downstream water levels. The hydraulic model will be used to predict any changes to peak water levels that could result from the works and enable BESL to minimise this through scheme design. Modelling will also be used to verify predictions as compartments are completed.

BESL's strategy towards water level management is to design compartment improvements so they do not change water levels either upstream or downstream This includes not increasing water levels in undefended communities as result of works elsewhere.

10 The project will provide flood defences to undefended riverside communities.

BESL will provide flood defences to properties in undefended areas and these will be constructed ahead of improvement works in adjacent compartments.

11 The project must not exacerbate the upstream movement of the saline limit in the rivers.

Monitoring will identify changes in the upstream limit of the saline wedge. This is thought to be changing through natural processes, and monitoring will identify if the project is exacerbating this above natural trends. It should be noted, however, that in any river, the upstream limit of salinity is influenced both positively and negatively by changes in the weather, seasons, tidal and fluvial flood events.

12 The quality of wetland habitats in the drained marshes will not be reduced as a result of the improvement works.

Over the lifetime of the Broadland Flood Alleviation Project (20 years), flood defence improvements will help to maintain the quality of the drained marshes and protect it from the damaging effects of long-term saline flooding. This will also protect the valued grazing marsh habitat and freshwater marsh dyke communities. It will do this by maintaining flood defence levels and the pattern of flooding, with an allowance for future sea level rise.

This objective does not preclude other solutions (such as washlands or managed flooding) that have significant and overriding sustainable flood defence benefits.

13 Improvement works must not exacerbate the current risk of flooding in the undrained peatland.

The majority of peatland is in undefended areas (ie where no flood defence improvements currently exist or are proposed). The hydraulic model will be used to help verify that specific choices on design and implementation would not lead to adverse environmental effects on undrained peatland.

14 Water quality in broads which are not currently connected to the river system will continue to be protected from tidal river inputs.

A number of broads are not directly connected to main rivers and the project will maintain this.

NAVIGATION	See also Policy Note 8

15 There will be no loss of publicly navigable waterways.

The project will aim to ensure that there is no significant loss of public navigable waterspace. This includes navigable width and depth (the 'navigation envelope'). If, in exceptional cases, a significant reduction is considered unavoidable, this will be fully justified at the detailed planning and design stage.

There is already background erosion and accretion taking place that are heavily influenced by weather, seasons, tidal and fluvial flood events. The Project is not a mechanism to arrest these background processes, but it will manage changes that take place as a result of the works. Up-to-date hydrographic surveys are being carried out jointly by the Broads Authority and BESL to identify how river channels change over time.

The project has the potential to affect the quality of public navigation by changing existing patterns of erosion and accretion; changes to the edge of the navigable area (changing from a hard vertical piled face to a sloping vegetated face); and the presence of potential hazards in the river channel (even if for a temporary period). Clear, public statements have been made about the responsibility of BESL and the Environment Agency to manage the environmental consequences of its works, and carry out remediation if necessary. As part of its approach to environmental management, BESL has agreed an approach with the Broads Authority on the management of new ronds and river edges where piling is removed following setback. Details on its implementation are currently being developed.

Haddiscoe Cut is owned by the Environment Agency who permit its use by the public. It is within the navigation area of The Broads Authority, who are also the Navigation Authority for it and all public waterways in the Broads area.

16 The work will not result in a reduction in the extent and quality of established public moorings and lawful public access to them by land and water.

Throughout the Broads river system there is a network of different types of public moorings. These are Broads Authority 24-hour moorings, parish staithes, moorings by bridges for sailing craft to lower and raise their sails or to await the assistance of pilots. Many of these make use of steel sheet piling historically provided as erosion protection by the Environment Agency. Where piling continues to serve its flood defence function effectively, public moorings will be maintained. However, where piling fails, or where alternative flood defence techniques are proposed, the project will make an alternative equivalent provision in the vicinity or alternative arrangements as agreed with the Broads Authority and/or relevant local stakeholders and landowners. Lawful right of access to existing moorings must be demonstrated before making an equivalent provision elsewhere.

Where improvements or additions to public moorings are sought, this should be explored through a partnership involving the Broads Authority (or other appropriate organisation) consistent with the principles set out in Objectives 33-35. The organisation promoting such improvements should also secure the agreement of landowners.

17 The project will not result in permanent hazards to river users. Potential short-term and temporary hazards to navigation will be avoided wherever possible but where this is unavoidable, they will be clearly identified to boat users in accordance with the requirements of the Broads Authority as Navigation Authority.

Potential hazards to navigation might include wherries engaged in construction temporarily reducing navigable width. It might also include redundant piling left in place after improvement work. In these circumstances temporary navigational markers will be installed until the hazard is removed.

ACCESS AND RECREATION	See also Policy Note 1

18 There will be no long-term reduction in the overall extent of public rights of way and other public access.

The improvements will protect public footpaths by stabilising banks and in most cases providing a wider crest. Where public rights of way pass over floodbanks that are to be set back, the existing route will be closed and a new route opened along the new section of floodbank. The new floodbank will be parallel to the old one, usually no more than about 50 metres away. This will mean small-scale changes to the length and alignment of some footpaths – usually minor increases. The overall effect of such changes will be localised adjustments to take account of new alignments. There will be changes to the overall length of footpaths but this is not expected to be significant. All routes and connections with other footpaths will continue to exist after the works.

Situations may arise where floodbanks will not to be maintained as they are at present (in the case of managed flooding, for example). In such cases, where a public right of way runs along the top of the banks, a permanent alternative alignment will be investigated. BESL will work in partnership with landowners, relevant organisations and stakeholders to identify how an alternative route should be provided.

19 Wherever possible the principle of barrier-free access will be incorporated into scheme design.

Along much of the network of public rights of way in Broadland, fences, stiles and gates can act as barriers to access for some users. This is formally described as 'furniture'. BESL will have full regard to the obligations placed on it by the Disability Discrimination Act 1995 and ensure it provides an equality of access for all users including people with disabilities where it has a legal responsibility to do so.

Fencing will be reinstated at property boundaries and field divisions where these are authorised and landowners request it. BESL will not increase barriers to access on public rights of way. If landowners request new boundary fencing, gates or stiles, the relevant consents will be required for them. BESL will only seek to remove authorised barriers with the permission of the landowners.

BESL has a sequential approach towards furniture on public rights of way. They are, in order of preference:

1 barrier-free routes
2 clear gaps in fencing
3 'kissing' or 'squeeze' gates
4 stiles

20 Measures to minimise disruption during construction will be incorporated into scheme design wherever possible.

Temporary closures along pubic rights of way are required to ensure safe working practices. Alternative routes will, in the majority of instances, be provided to ensure people who live, work and visit can enjoy equivalent rights of way throughout Broadland.

21 Public rights of way will be reinstated to at least their existing standard after construction.

The existing public rights of way are usually uneven and where they pass along the crest of floodbanks they are often narrow with steep slopes on both sides. Following improvement works the crest of floodbanks will be about two metres wide and the footpaths will be reinstated so they have a level and flat surface. This will be seeded to prevent them becoming cloggy and hazardous. Suitable means of access will need to be incorporated into reinstated footpaths so grasscutting machinery can operate.

BIODIVERSITY, NATURE CONSERVATION AND WATER QUALITY	See Policy Notes 3, 4 & 9

22 Following completion of maintenance or improvement works, the resultant mosaic of habitats within the working area will be capable of at least the same ecological function (ie same range of species and communities) as existed before work started.

Construction impacts on habitats within the works corridor are unavoidable. There will be limited scope to mitigate effects on these habitats when works are taking place. The completed works will result in a change in the proportion of different habitats rather than absolute loss. By changing the proportions of habitat within river corridors the project will assist in maximising the capacity to support biodiversity and ensure there is no net loss of biodiversity overall.

Existing **rond** habitat will erode/accrete over time due to natural processes and provided ronds continue to offer effective natural erosion protection to the floodbanks, there will be no intervention in these processes. Other areas of rond habitat will be maintained and extended where floodbanks are setback. As part of the project's approach to sustainable flood defences including setback, there will be substantial improvements to the area and continuity of rond. Opportunities also exist to create a reedswamp fringe to the rond edge. Not only will this benefit conservation and the landscape but it will significantly help to reduce rond erosion.

The project will deliver substantial benefits to grazing marsh habitat by protecting it from long-term flooding. However there will be a net loss in **grazing marsh** due to setback and material sourcing. The scale of loss in any particular flood compartment will be small relative to the total amount of grazing marsh that will remain. Replacement grazing marsh (often through arable reversion) will be provided for losses within European sites.

The emphasis on improvements to flood defences by bank strengthening and setback means that the area of **floodbank** will increase. Grass cutting on floodbanks is essential to ensure that tree roots do not weaken the banks and also to allow floodbank condition surveys to be carried out. Grass cutting is also required for health and safety purposes, to allow users to clearly see the edge of the crest. In European sites the floodbank habitat itself supports certain species and in these areas BESL has agreed a modified cutting regime with English Nature. This is designed to ensure vegetation has sufficient time to regenerate between cuts to support the associated species.

The area of **folding** will change and more detailed engineering and environmental planning is needed to accurately quantify such change. The increased footprint of improved floodbanks will reduce the folding in some locations. Where the folding is wide enough it may also be reduced by material sourcing from the folding side of existing soke dykes. In some cases, reconfiguration of the soke dyke will lead to an increase in folding width. The aim will be to provide a minimum folding width of 9m in all cases. The management of foldings is not expected to change as a result of the works. There will be a loss in saltmarsh communities on foldings due to a reduction in seepage of brackish/saline river water onto the foldings in the lower valleys. This is outweighed by the improved protection to all land protected by floodbanks from the damaging effects of long-term saline flooding.

The area of **soke dyke** will increase as this is the main source of clay material for construction.

There will be some new lengths of **marsh dyke** created but also some areas where this will be reduced. BESL estimates that there will be a small net loss of this habitat compared to the overall resource.

23 The design and implementation of improvements and associated infrastructure will seek to maximise opportunities to enhance existing grasslands or create new grazing marsh habitats.

Existing and future agricultural support mechanisms are a further consideration. The Broads ESA will come to an end in March 2004, but existing ESA agreements will remain in place for up to 10 years. A revised framework for Agri-environment Schemes in England will come into effect from April 2004 onwards, and it is anticipated that this will provide continued support to farmers whose land is grazed in accordance with traditional practices. BESL will work with agreement holders to ensure that, wherever possible, agreement boundaries are not reduced. Where beneficial management under the ESA or its successor scheme is no longer possible, any necessary reduction will be agreed with the landowner.

It is likely that opportunities will exist to create a range of appropriate floodplain habitats. In the majority where habitat creation takes places (either formally or informally) this will involve a reversion from arable to grazing marsh in the majority of cases. The works may also present opportunities to provide new / enhanced dykes and water level control structures to assist with water level management.

24 There will be no adverse impact on the area and quality of existing estuarine habitats as a result of the project.

This relates specifically to Breydon Water. The nature conservation interest is in the mudflats that provide feeding areas for birds at low tide. Existing patterns of sedimentation in Breydon Water will, over time, reduce the area of mudflats and increase saltmarsh habitat. The project must make sure that its work does not exacerbate these natural processes. The hydraulic model will assist decisions on engineering and environmental design and implementation, and monitoring will measure the project's effects.

25 The design and implementation of works in European sites will avoid or minimise significant adverse effects and will aim to maintain or improve favourable conservation state. Proposals in European sites will be brought forward in detailed consultation with the relevant statutory organisations and specialist advisors to ensure the effects of the works are fully addressed.

The project will result in considerable benefits to European sites by providing appropriate levels of flood defence to component SSSIs that are protected by floodbanks. In some cases English Nature may advise that the works are necessary for the conservation management of the site. In any event, the project will always seek to avoid or minimise significant effects on protected habitats and species. The process to determine and assess impacts on Europeans sites and features is complex and must involve competent authorities and specialist advice from other organisations.

There are key issues to consider in assessing impacts of the works on European sites:

- The significance of effects;
- The loss of functioning habitat;
- Effects on site integrity.

26 BESL will make provision for new habitat creation to balance losses in European sites.

Depending on individual circumstances, new habitat creation will be delivered either on a voluntary basis or as a statutory requirement.

LANDSCAPE	See also Policy Note 2

27 Landscape changes will be of a scale and nature that is in keeping with the local character and of benefit to the Broads environment as a whole.

The project will deliver significant benefits by protecting the valuable and sensitive National Park landscape and will give the river's edge a more natural appearance by the creation of new ronds and the removal of piling where setback takes place. Without flood defence improvements the level of protection provided by such defences will diminish and eventually defences will fail. The consequences of the project not taking place, or being delayed, are that, without the maintenance of floodbanks, the characteristic drained marshes landscape would alter radically, reverting to estuary, reedbed, fen and open water.

There will be changes to the width and height of improved floodbanks. The greatest changes to floodbanks will be in downstream reaches of main rivers where, for example, bank strengthening will raise bank heights by up to 60 cm. In these locations bank widths will increase where the gradient of their slopes is too steep and they need to be reduced to about 1 in 3. Here, the larger banks will be up to 3 metres wider.

Soke dykes will be widened to enable clay material to be sourced locally. To allow long-reach machinery to maintain them in future, these cannot be wider than 18 metres. To enable them to be well integrated back into the landscape, BESL will construct new and widened soke dykes so they have berms on both sides. BESL will establish reed fringes on both sides: these will reduce the visible area of water and help to integrate the dykes into the surrounding landscape.

BESL do not believe that these changes, by themselves or in combination with adjoining bank works, will be detrimental to the character of the wider landscape. However, proposed changes will always need to be evaluated on a site-by-site basis.

The Broads Authority is currently developing a Broads landscape characterisation study. This is expected to help the flood defence project by identifying elements that make up the local character that require sensitive and specific consideration.

28 Flood defence works in riverside villages must not detract from the quality and character of the built environment.

Riverside villages contribute to the character and appearance of the Broads and they have a distinctive relationship with the rivers and the surrounding environment. Many still retain a traditional appearance. The planning and design of works at undefended communities will seek to preserve the local character and, where possible, to enhance it.

29 Specific attention will be given to small-scale features and details in the wider Broadland landscape.

Careful attention will be given to the treatment of small-scale details (gates, stiles, fences, cattle pens etc.) where these are directly affected by flood defence improvement works. Consideration in the first instance will be given to the re-use of existing materials.

30 The use of 'soft' sustainable flood defence materials and techniques will be maximised throughout the project. The use of 'hard' engineering techniques and materials should be minimised.

The project will deliver sustainable flood defence improvements and maintenance in ways that work with natural processes and maximise the use of 'softer' more natural solutions. Similarly the use of 'hard' materials and heavily engineered solutions will be minimised and used only where there is no viable softer alternative. Soft erosion protection will increasingly be replaced where appropriate by reed rond, alder pole piling, coir logs, reed rolls, earth covered gabion baskets, and asphalt matting.

CULTURAL HERITAGE

31 The project will avoid significant adverse effects to the condition of known features of historic, cultural or architectural importance.

When planning and designing improvement works BESL will carefully consider the effects of its proposals on known features of heritage value and avoid, as far as reasonably practicable, any adverse impact. Any unavoidable impacts will be evaluated on a case-by-case basis in consultation with statutory advisors and other appropriate organisations and measures will be taken to manage and mitigate and impacts.

To inform it about the location and nature of such features, BESL makes use of official information in the public domain. BESL will therefore relies on the advice of relevant organisations to highlight any additional important features of cultural heritage value that are not formally listed or designated.

32 The existing level of flood defence to features of known historic, cultural or architectural importance will be retained wherever this is appropriate.

BESL will examine how each of its detailed proposals will affect known features, such as riverside windmills. Their present condition varies significantly and while some have been (or are proposed to be) restored, others are in an advanced state of dilapidation with no prospect of re-use. BESL will plan, design and implement its proposals in a way that enables future work to windmills by owners and/or relevant organisations, such as the Norfolk Windmills Trust or the Broads Authority, to be carried out.

33 The project will evaluate the potential for archaeological interest in development sites. Where required, BESL will agree and implement a watching brief and a mitigation strategy in the event that significant finds are discovered.

Consistent with current policy and practice, BESL will examine archaeological potential on a case by case basis as part of the planning process. However, because little development has taken place in many parts of Broadland there is no widespread understanding of the archaeological resource in the area. Where planning proposals involve below-ground excavation, an evaluation will be determined with an appropriate advisor. BESL will rely on the advice of the Broads Authority and Norfolk and Suffolk County Councils regarding important unlisted buildings to enable these features to be taken into account.

PARTNERSHIP BENEFITS

34 BESL and the Environment Agency will seek to maximise the delivery of non flood defence benefits in association with the Project.

The term 'enhancements' is used to describe all the positive effects, or benefits, which the Project will deliver *in addition to improved flood defences*. BESL and the Environment Agency have developed a joint approach to the consideration and delivery of non-flood defence benefits throughout the Project Area.

BESL recognises that the delivery of such benefits, in conjunction with the design and implementation of flood defence improvements, represents an opportunity to further the Agency's environmental vision for a healthy, rich and diverse environment. BESL is keen to explore stakeholder aspirations on behalf of the Agency, with a view to identifying such opportunities.

In practice, a number of these non-flood defence benefits can be designed into the improvement proposals and delivered directly through the Project. For example, footpaths will have wider, safer floodbanks; the removal of failed piling will reduce potential hazards to navigation; and the use of 'softer' erosion protection methods will create a more natural looking landscape.

Other benefits require a partnership approach with the Authority and others to achieve the necessary coordinated, strategic approach to identifying, funding and implementing enhancements.

35 Where opportunities exist to deliver Partnership benefits in the Broadland Project area, the Agency will consider whether it can play a role in their delivery. Wherever possible, it will work with others to maximise the potential benefits to the Project area.

A number of stakeholders have identified other possible benefits that it will only be possible to deliver with additional funds. Examples of these include the provision of new moorings, improvements to public rights of way, and the provision of community facilities, such as river frontage improvements (lighting, seating, surfacing etc). In these situations, the Agency is keen to work in partnership with other lead agencies.

BESL's primary interest is the improvement and maintenance of flood defences. In planning and implementing these works it will have due regard to the potential for enhancement through partnership opportunities. Such opportunities, however, will not be allowed to delay the overall project programme.

36 BESL and the Agency will work with the relevant stakeholders in order to develop a strategic approach to other possible benefits, so that Project and Partnership funds can be used in a co-ordinated fashion to maximise the overall benefit of the available resources.

In most cases, the distinction between Project benefits and Partnership benefits will be straightforward, but from time to time there will be some 'grey areas', for example the maintenance of existing flood defences to protect disused drainage mills or similar historic structures.

A strategic approach to partnerships will ensure that consideration is given to possible opportunities in the early stages of scheme design, allowing the necessary lead-in time to develop initiatives where appropriate. It is envisaged that specific objectives will be developed through the Agency's involvement in current stakeholder initiatives, such as the County Council's new Rights of Way Improvement Plan, and the review of the Broads Authority's Broads Plan. In this way, it may be possible to facilitate a range of Partnership benefits, including for example, the following:

- Improvements to public access, including disabled access, in suitable riverside locations
- The provision of public moorings and other facilities for public recreation on or near the river
- The provision of improved flood defence, in conjunction with access or other improvements, to protect features of known historic, cultural or archaeological importance.

The review of the Broads Authority's Broads Plan could provide a focus to develop a unifying vision of the Broads and to co-ordinate a programme of partnership benefits associated with the Project. The development of enhancements through partnerships must not delay BESL's extensive programme of works.