

2.1 Site Analysis

Rot63 The issues which have positive and negative effects on the management of the site

Site Strengths	Site Weaknesses	External Opportunities	External Challenges
<ul style="list-style-type: none"> • The estuary is the most important single-river estuary in the UK for birdlife. It is second only to the Wash in numbers and diversity of migratory waders and wildfowl • A large proportion of the estuary is owned by Natural England and much of the remainder is subject to agreements which are favourable to the conservation interest. • The site is large and remote with difficult terrain covered regularly by tides. This ensures minimal disturbance to the conservation interest. • The current grazing management has successfully improved the range of habitats available for most wintering and passage bird species. • The extensive saltmarsh of the estuary plays an extremely important role in the coastal flood-defence by absorbing most of the tidal wave action. 	<ul style="list-style-type: none"> • Natural transition at the upper end of succession is curtailed by flood defence works along most of the site boundary. • While wintering bird populations have generally increased in response to management practises, many of the important breeding species have declined significantly in recent years which needs to be addressed • The physical nature of the site imposes severe constraints on management. Inter-tidal flats are virtually unmanageable, saltmarsh grazing regimes are limited by problems of access and stock control, public use is restricted largely to non-tidal areas, monitoring is extremely difficult. • Safety considerations influence the management of public use, including use for research, education and recreation, and the management of work carried out by contractors and NE 	<ul style="list-style-type: none"> • The Ribble is one of the major estuaries within the North West European flyway. It is thus strategically important as part of a complex of internationally important shorebird habitats in north-west England. • Natural geomorphological processes occur within the estuary and the current stable accreting system is maintaining and, for saltmarsh, increasing the area of key habitats. • The demand for public enjoyment and appreciation is high. • The support from local land owners/farmers has enabled NE to manage grazing regimes proactively. • Pollution levels within the system are reported to be sufficiently low to have minimal impact. • Proposals for the establishment of the Ribble Coast and Wetlands Regional Park should offer opportunities to enhance the nature conservation value of the estuary and its surrounding farmland and wetlands (including restoration of saltmarsh habitats on reclaimed fields), and also promote appreciation and understanding of this natural heritage to the general public 	<ul style="list-style-type: none"> • Climate change is likely to effect the distribution of some bird populations while forecasts of rising sea level may have a detrimental effect on the extent of habitats present. • The demand for recreational use is increasing. This may lead to an increase in disturbance. • Potential risk of bird-strike with aircraft using the adjacent BAE Warton Site leading to requests for culling birds and other measures to reduce the potential risk. • The management of the site is very vulnerable to significant changes in agri-industry. • Potential future spread of foot and mouth or blue tongue diseases to cattle would impact on marsh management and could have long-term impact on stock availability if local graziers cease business. • Pollution levels are totally outside the control of NE.

Site Strengths	Site Weaknesses	External Opportunities	External Challenges
<p>This is extremely efficient and cost-effective compared with the hard engineering alternatives which would otherwise be required.</p> <ul style="list-style-type: none"> The site generates a significant level of income on an annual basis (c. £45,000). 	<p>staff.</p> <ul style="list-style-type: none"> The scale of the site and the management required results in high running costs and expensive major projects. There will no longer be a dedicated Ribble Estuary Senior Reserve Manager based at the Ribble Offices. A new staffing model is to be used whereby NNR staff within the Wirral to Wyre Team will work across all the three NNRs in the team area with two SRM's working with distinct responsibilities not based on geographical locations. 		<ul style="list-style-type: none"> A major pollution threat exists in the development of oil and gas exploitation in Liverpool Bay. Potential spread of avian flu could severely hit bird numbers and affect promotion of access to the site. Various regeneration proposals have been discussed which could have a severe impact on the NNR including proposals for a barrage, a marina and a hovercraft service between Southport and Blackpool

2.2 Site Management Policy

The broad management policies for the site and the reasons why these options have been chosen

Breeding bird aggregations and assemblages, and aggregations of non-breeding birds

When the Estuary was originally designated as a SSSI, and subsequently a Ramsar site and SPA, the principal interest identified was the considerable number of passage and wintering birds. Historically, then, the management of the site for breeding birds has been secondary to the management for wintering waterfowl. However, the 2001 review of the SPA has emphasised the importance which the site also has for internationally and nationally important breeding bird populations. It is therefore important that future management addresses the requirements of the notable breeding birds at least equally with the non-breeding populations.

The population levels of waterfowl on the site fluctuate significantly in response to both natural and human-influenced changes, which may occur within the estuary or elsewhere in the birds' range. Within the estuary there are three main factors that may influence population levels of birds:

- i) Disturbance to breeding, feeding and roosting areas* - Disturbance to birds can arise from leisure activities, including dog walking and use of leisure boats and jet skis on the river. Natural England will ensure that disturbance by human activity to roosting sites on the edge of the saltmarsh areas will be minimised over all high tide periods throughout the year, so that these sites remain available to the birds when required, and to grazing marsh throughout the winter period so that at least 30% of grazing sites remain available to the birds when required. Elsewhere in the estuary, Natural England will seek to influence other agencies and managers of habitats to ensure that other roosting and feeding areas are given similar protection. Natural England will undertake a review of management operations (particularly grazing intensity) to safeguard breeding bird populations from disturbance.
- ii) Pollution levels* - There are two main groups of pollutants which may affect waterfowl in the estuary. The first group are those carried in the water column and become incorporated in the substrates, thus potentially affecting the invertebrates on which the waders feed. These include organic and inorganic toxins, radioactive residues and substances that affect the Biological Oxygen Demand (BOD) in water or sediments. The second group are those which are carried on the water surface and collect on the surface of the substrates, from where they may contaminate both waders and wildfowl directly. These are mainly organic and include petrochemical raw materials and products and industrial effluents containing fats and oils. The development of an offshore oil/ gas industry poses a significant threat to the site in this respect. Any spillage of oil, or similar substance, could potentially prevent use of large areas of the saltmarsh by nesting birds, and may affect birds when feeding or roosting by contamination of saltmarsh vegetation or in shallow water areas in the outer parts of the estuary. There are no short-term solutions should this potential be realised.
- iii) Saltmarsh condition* - Management on the NNR has generally been successful in maintaining the short-sward marsh required by grazing wildfowl and roosting waders, while also giving consideration to the maintenance of short sward turf interspersed with scattered tussocks of longer vegetation which is required by most of the NNR's notable breeding bird species. Suitable habitat is best produced by light to medium grazing pressure using cattle as grazing agents. Sheep grazing has also been employed in areas where access for cattle is restricted,

though cattle generally produce a better sward for wildlife and ideally would be used throughout. Banks Marsh, the western half of Hesketh Marsh and the northern sector of Warton Marsh appear to be the best areas for the sward mosaic favoured by nesting birds and the recently erected fence at Banks Marsh has enabled more subtle manipulation of the grazing regime here which has begun to benefit breeding wader species as well as other birds including grey partridge and skylark. Further accretion of saltmarsh, combined with stable stock levels, should increase the area of marsh subject to light-to-medium grazing pressure which should therefore increase the optimum habitat for breeding birds over ensuing years. In the short-term, the existing management regime will continue with the aim of maintaining this type of habitat for successful breeding by waders, terns and gulls in conjunction with the extensive short-sward marsh favoured by wintering species, but this will be reviewed over the course of this management plan to see whether more can be done to favour breeding bird populations.

External factors, over which Natural England has no control, are many and varied. Climate change is already affecting bird numbers; for example, Bewick's swans are increasingly remaining in continental Europe, while new species are moving in such as little egret. Such changes in bird distribution may necessitate a further future reappraisal as to which species are important to the site. Changes in management elsewhere within a bird's range can also impact upon numbers at the Ribble Estuary. Fluctuation in numbers of pink-footed geese on the Ribble Estuary appears to be largely due to use of other feeding and roosting sites both locally and further afield, including Norfolk where the extension of sugar beet crops dramatically increased the number of pink-footed geese wintering in that area to feed on the beet tops, causing a subsequent reduction in numbers of geese remaining to over-winter on the Ribble. However, climate change also seems to have delayed the return of pink-footed geese to their breeding grounds in Iceland and Greenland, and the birds that are visiting the Ribble are generally grazing later in the season, after the widgeon have left and the grass is beginning to grow again. Clearly, such factors are beyond the scope of management within the NNR and such changes in distribution are not necessarily a negative factor when the population is considered in a national or international context.

While numbers of passage and wintering birds have undoubtedly increased overall in response to the NNR management regime, there is a question mark over how appropriate this has been for some of the breeding species. Over the years, it has generally been considered by Natural England (and its predecessors) that populations of breeding birds have been maintained by the long-term stable management of the site and that the recent decline in numbers of some species appeared to be due to natural environmental factors over which NE has no control, rather than due to any site management practices (or lack of). In particular, high spring tides have caused problems in recent years and this could become a greater issue if predictions of rising sea levels caused by global warming are correct. However, because of the increased emphasis of the site's breeding birds, the decline in certain species (e.g. black-headed gull, common tern and redshank) requires further investigation; in terms of identifying locations of favoured breeding grounds, determining whether adjustments to the management regime could better serve the breeding populations, and to consider whether other factors may be impacting upon these populations such as disturbance, egg-collection or high levels of natural predation (e.g. by foxes; although it should be noted that a degree of natural predation should be tolerated as part of the natural ecosystem provided notable features are not seriously threatened).

The colony of large gulls has remained stable in numbers for the last 10 years, but their distribution has changed, for reasons which are not fully understood at present, with new areas of the saltmarsh on Banks Marsh having recently been colonised. This increase in larger gulls has raised concern from BAE systems over the potential for bird strike. Natural England is actively

working with BAE to resolve this issue. Interim notices are currently being considered and the impacts of these on breeding birds needs to be monitored and management options developed for this area of the marsh. Annual monitoring is proposed in future years to assess population trends and also to consider the potential impact of large gulls upon other species.

Monitoring of the in-Estuary factors likely to affect the waterfowl will be through liaison with key partners on the estuary and by routine patrol.

Monitoring of the population levels of waterfowl present throughout the year has been carried out by volunteers since 1970 through the auspices of national surveys (Birds of Estuaries Enquiry 1969/70 - 1992/93; Wetland Bird Survey 1993/94 onwards). This monitoring is of key importance in determining the health of waterfowl populations on the site and provide an indication of the suitability of ongoing management.

Littoral sediment

The intertidal habitats within the estuary form a significant part of the total habitat resource in northwest England. The large invertebrate community together with the range of feeding and roosting opportunities which are supported has resulted in the estuary, in turn, supporting a very large and internationally important population of migrant wildfowl.

The extent and range of the sub-habitats of the intertidal flats govern its biotic productivity, and are the main factors in its ability to support large numbers of migrant waders. The distribution of the sub-habitats is the main factor in its ability to provide suitable roost sites for both waders and wildfowl.

The natural processes occurring within the estuary are accretive and result in gradual progression seawards of both edges of this zone. Negative changes in sea level may have been a contributory factor in this process, and any reversal may affect the extent of this habitat within the system in the future. Potential threats to the favourable condition of the habitat, therefore, are from rises in sea level as well as the risks of increasing pollutant input and increasing levels of human disturbance. The key to successful management is the maintenance of the present total area and areas of sub-habitat types, the maintenance of a low level of pollution and the maintenance of a low level of disturbance.

The nature and geographical position of this feature limit the opportunities for active management and the main aim for Natural England will be to allow the natural and uninterrupted development of the natural physical coastal dynamics. Management effort will, therefore, be of an indirect nature, influencing the actions of others to ensure the favourable condition is maintained by avoidance of damaging activities. The agencies/bodies involved are the Environment Agency (water quality), Defra (water quality and pollution affecting agricultural and fishery use), the local Sea Fisheries Committee (viability of shellfish beds) and the developing Ribble Coast and Wetland Regional Park (the human use of the estuary).

There is now no single agency with responsibility for the maintenance of navigable channels in the estuary and therefore no artificial control over sedimentation patterns. The major factor likely to affect sedimentation patterns and distribution is the winning of sand from the two main sand Banks in the estuary; the Horse Bank on the southern side and the Salters Bank on the northern side, though sand winning from Horse Bank has now stopped and is under review at Salters Bank. Natural England's role will be to monitor the status of this feature and report problems or changes arising to the appropriate body as part of this review.

Saltmarsh

The historical management of saltmarsh in the Ribble Estuary by grazing with sheep and/or cattle has created a range of sward conditions, which are a consequence of grazing pressure and stock type. The resulting habitat range from heavily sheep-grazed to lightly cattle-grazed saltmarsh, though the majority of the grazed saltmarsh in the estuary is covered by a *Puccinellia maritima* dominated short-sward turf. This short sward has provided ideal conditions for large populations of herbivorous wildfowl, while areas of saltmarsh with some structure in summer attract large populations of breeding birds and areas with some remnant structure in winter provide shelter for passerines and raptors and feeding opportunities for seed-dependent wildfowl. The past management of the whole site has therefore produced a balance of habitat types that provide support for the wide range of avian populations. The broad thrust of future management should follow the same pattern, though some adjustment to the grazing regime may be required in places following a review of the requirements and causes of decline of certain notable breeding birds.

The continuing accretion of saltmarsh should further enhance the diversity of the sward. Areas of accreting marsh are typically too problematic to graze regularly as they are generally further from access points for stock, may be inaccessible to stock due to the topography, and are only grazed when grass is in short supply due to climatic factors. However, the irregular grazing which they have received has allowed the development of a more rank structure and diverse composition which has created an alternative habitat to the short-sward grazed marsh, with opportunities for populations of different species to increase. Future management should seek to diversify the range of habitats present on the grazed saltmarsh areas of the site where opportunities arise and where this does not conflict with the maintenance of favourable condition of saltmarsh habitat on the whole site.

The grazing regimes on Crossens, Banks and Hesketh Marshes currently provide a good balance of conditions and should therefore broadly continue to be managed in the same way over the period of this plan, with adjustments as necessary to benefit breeding bird populations. On Banks Marsh the further accretion of green marsh will result in a reduction in grazing pressure, allowing the development of more rank habitats. Unless this results in an imbalance between short-sward and tussocky habitats the process will be allowed to develop. If an imbalance results then a change to more directed grazing management by compartment will need to be undertaken. We will also need to consider the impacts of our current management regime on the numbers of large Gulls using the outer marsh for breeding due to the concerns raised by BAE systems regarding potential bird strikes. Natural England is actively working with BAE to find a solution. In addition to the grazed marsh, there is an extending area of immature, ungrazed saltmarsh at Crossens/ Marshside, part of which is within the NNR boundary. There are very few areas of ungrazed marsh within the Estuary, so this area will be maintained in an ungrazed condition by ensuring that stock is excluded at all times in order to enhance the diversity of the Ribble's saltmarsh habitats. This diversity has also provided opportunities for research, where studies have been carried out to compare invertebrate life and other factors between grazed and ungrazed marsh. No management other than the exclusion of stock will be carried out and the marsh will be left to develop naturally. Efforts will be made to ensure that the area currently outside the NNR is similarly managed and an approach to the adjacent landowners will be made to attempt to bring this area within the influence of this management plan.

The narrow strip of marsh at Beconsall Marsh has presented difficulties for grazing in the past and has limited value for birds due to disturbance levels from the footpath which runs the length of this marsh. There is a need to review and significantly alter the grazing regime here to promote wildlife benefits.

Coastal grazing marsh

The 9.14 ha of unimproved grassland at Old Hollow, supporting a species-rich sward including three species of orchid (common spotted orchid *Dactylorhiza fuchsii*, early marsh orchid *D. incarnata* and southern marsh orchid *D. praetermissa*), is rare in a regional context. This habitat is a relic of the original use of reclaimed saltmarsh as grazing marsh and is extremely scarce within the estuary. Virtually all reclaimed land elsewhere in the estuary has, for many decades, been converted to arable. The land at Old Hollow is probably the most botanically diverse area of freshwater wet grassland in the whole of the estuary.

Since 1988, a crop of hay has been taken off this area in July and grazing has occurred subsequently in September. This appears to have increased the distribution of orchid species. Future management should broadly follow these traditional hay-meadow practices, though with some variation to further enhance the wildlife value of the site.

It is proposed that the majority of the meadow will be mown annually between late July and early August, with cuts of sub-sections staggered through this period so that the whole meadow is not cut at once, while margins of the meadow will be cut in late summer/ early autumn to allow development of seeds. Meadows are often poor in invertebrate numbers and diversity because of the severe impact of a single cut over the whole site, so staggering the cuts through the summer may help maintain numbers of invertebrate prey for breeding birds, while leaving some areas to set seed late in the summer will benefit seed-eating farmland birds. Aftermath grazing will commence in late November until early March using a flock of approximately 40 sheep. By the time the sheep are removed, ideally there should be a short sward with some tussocky and wet areas prior to regrowth of the meadow sward which should attract breeding bird species including lapwing. A monitoring project will be established to determine NVC communities present, to be repeated on not more than a ten-year interval.

Controlling water levels by reinstatement of a sluice will seek to increase wetted margins of the meadow and establish reedbed as a transitional feature, while planting and maintaining a hedgerow around the dry margins of the meadows will further diversify the available habitats for breeding birds.

On reclaimed marsh at Hundred End a lagoon has recently been created to link in with the RSPB's habitat creation work at Hesketh Out Marsh and should enhance interest features in this area for visitors using the public footpath. Presently, the lagoon is too deep and lacks shallows or wet margins, but the Environment Agency have agreed to grade one of the banks which will have the benefit of both allowing vegetation to establish and allow any cattle which fall in to escape. This area may need fencing to prevent cows from trampling the vegetation.

Education and Research

A concerted effort needs to be made to direct interest towards study and research that will enable better management of the site. Key areas are species presence and distribution, especially of saltmarsh and brackish-water invertebrates, population levels and fluctuations, particularly of waterfowl and breeding birds, and topographical trends, particularly related to the extent and distribution of saltmarsh and intertidal flats.

Use of the site for study and research which has no direct input to site management will also be encouraged except where it has the potential to damage the nature conservation interest or makes unrealistic demands on staff resources.

Safety considerations in the intertidal areas limit the potential of the NNR for open access educational use, but use of the NNR for this purpose will be encouraged whenever it is safe to do

so. Lectures, talks and displays will be provided to support educational needs as far as resources allow.

Recreation and Access

Facilities for birdwatching on the estuary have always been limited by the lack of parking facilities and access allied with the lack of suitable vantage points. In particular, it has been difficult for Natural England to offer such facilities because all of the land owned or managed is tidal or has no public access leading to it. In recent years, this has been addressed at an estuary-wide level by the establishment of an RSPB-run centre at Fairhaven Lake, Lytham, and the creation of a reserve at Marshside by Sefton MBC which is also managed by the RSPB. Further developments are planned in the very near future with the proposed establishment of RSPB-managed transitional habitats and bird-watching facilities at Hesketh Out Marsh.

The opportunity to allow free access onto the saltmarsh areas from the public footpath network exists but this cannot be actively encouraged due to the inherent risks to the public on tidal saltmarsh. Natural England will continue to support local agencies and neighbours to develop the footpath network around the estuary where this is not likely to cause any damage to the nature conservation interest of the NNR. In particular, the Ribble Coast and Wetland Regional Park initiative seeks to enhance nature conservation and access as part of promoting the environmental, social and economic development of the region, and the establishment of the North-West Coastal Trail (funded by the NW Development Agency) is likely to increase numbers of people using the estuary footpaths. Development of the NNR at Hundred End, in partnership with neighbours including the RSPB and linking into the Hesketh Out Marsh development, could serve to improve access facilities and open up at least part of the NNR to larger numbers of visitors.

Wildfowling has been seen as a traditional use of saltmarsh and intertidal areas within the estuary, and this was acknowledged in the declaration of the NNR in 1979. Nationally, Natural England's current policy is to '*recognise sustainable harvesting of quarry wildfowl through controlled wildfowling as a legitimate use of a wildlife resource*'. It is an activity which has been considered difficult to control without the co-operation of the participants and a great deal of effort has been put into establishing acceptable wildfowling regimes on the NNR, managed by the Wildfowling Associations. This has worked to the benefit of both the wildfowlers and the wildfowl since wildfowling opportunities have been maintained and often improved while populations of both wildfowl quarry species and other migratory waterfowl in the estuary have increased significantly since the reserve was established. In addition the participating Wildfowl Associations and individual Association Members contribute greatly to ongoing policing and scientific monitoring on the site. The latest extension of the NNR included the acquisition of Warton Marsh by the local Wildfowlers Association; included within the NNR under Section 35 1c of the Wildlife and Countryside Act 1981. The wildfowling management on the estuary is now accepted as an example of 'best practice' by DETR in its Best Practice Guidelines for the Coastal Zone.

There are, however, many public concerns about the impact of wildfowling including the number of birds taken, the extent of the 'sanctuary' area where shooting is prohibited, disturbance caused to birds and safety to other NNR visitors. It is vital that all of these issues are reviewed regularly when wildfowling licenses are renewed, using the new Natural England Guidance.

References

- Gee M (2003) *Ribble Estuary National Nature Reserve management plan*. English Nature unpublished report.
- English Nature (2006) *The Ribble Estuary NNR interpretation plan*. English Nature unpublished report.

2.3 The Vision

A 50 Year Vision for the Ribble Estuary National Nature Reserve

The aim for the next 50 years is to see the NNR become part of a coastline which is as natural as possible, even richer in wildlife than it is at present, and one which stimulates public interest in coastal wildlife and offers major opportunities for public engagement with the natural environment.

Over the next 50 years, it is likely that major opportunities to expand and enhance the nature conservation interest of the estuary will arise through realignment of existing sea defences to reinstate long-lost upper salt marsh and transitional habitats from existing reclaimed land which is presently used for agriculture. Such work would be carried out, not only to benefit nature conservation, but also as part of a more sustainable programme of flood-defence. The NNR will form a key part of this enhanced estuary habitat. Initial breach of the sea defence took place in September 2008, where essentially transitional-type habitats have been created on Hesketh Out Marsh. By 2058, hopefully the majority of reclaimed marsh will be restored to saltmarsh habitats with an associated increase in the numbers and diversity of migratory waterfowl and breeding birds. Expansion of the natural estuarine habitats could also help to counter the currently unknown effects of global warming which could impact upon the Estuary over the next 50 years. It is possible that rising sea levels could lead to loss of salt marsh area at the estuary margins.

The marsh should comprise a variety of swards, providing habitat niches variously required by different bird species at different times of their life cycle; ranging from close-cropped marsh for grazing wildfowl, tussocky grassland for breeding birds and areas of ungrazed marsh together with transitional swamp and tall-grassland areas in the newly restored upper marsh. Grazing should be carried out by a closed herd of organic, traditional breed cattle, enjoying a premium marketing niche providing saltmarsh beef to high value outlets. Ideally this would be achieved through a partnership with local farmers and cattle breeders where they would use the NNR for summer grazing, with the option of extending grazing into both spring and autumn where necessary to achieve better vegetation management. The cattle breeders would provide over wintering for the animals and the ownership of the animals could be either in partnership or rest solely with the farmers.

In 50 years time, the NNR should form a key part of the Ribble Coast and Wetlands Regional Park, which should, by then, be well established as an internationally recognised destination for its environmental significance; thus playing an important part in the economic and cultural regeneration of the region. Working in partnership with the Environment Agency, RSPB, local authorities and others, access opportunities to the estuary should be greatly improved, allowing greater appreciation of the site's nature conservation importance for increasing numbers of visitors. In particular, extensive restoration of upper marsh and transitional habitats should enhance both the landscape and natural history interest of the higher, and safer, parts of the marsh, which would considerably enhance opportunities for recreational activities.

2.4 Objectives

What we want to do during the period of the plan to take us towards realising the Vision.

2.4.1 Geological and Biological Objectives

Objective 1:

Maintain the extent of saltmarsh within the estuary in favourable condition, with particular respect to the internationally and nationally important bird populations

Features addressed by this objective:

1, 3, 5, 7 Aggregations of breeding birds, 2, 4, 6, 8 Aggregations of non-breeding, 9 Breeding bird assemblage, 11 Saltmarsh, 13 Breeding Birds of Conservation Concern/BAP species

Attributes/targets for key features:

Feature 1, 3, 5 and 7: Aggregations of breeding birds

Attribute: total population

Target: Where the limits of natural fluctuations are not known, maintain the population above 75% of that at designation - a loss of 25% or more unacceptable.

Lower limits (based on 75%) of breeding population are: 136 pairs of common tern, 1 pair of ruff, 3075 pairs of lesser black-backed gull, 8925 pairs of black-headed gull, 200 pairs of redshank and 21927 individual seabirds (including black-headed gull, lesser black-backed gull and common tern).

Attribute: habitat extent

Target: Maintain the area of saltmarsh used by the feature within acceptable limits (estimated 1496.4 ha saltmarsh in units 2, 3 and 4). No loss of habitat on the NNR other than natural erosion caused by natural physical dynamics of the coastal system.

Features 2, 4, 6 and 8 Aggregations of non-breeding birds

Attribute: Total population

Target: Maintain population within acceptable limits (in this context population can be that of an individual species or the total population of an assemblage): Based on the known natural fluctuations of the population in the site, maintain the population at or above the minimum for the site. Where the limits of natural fluctuations are not known, maintain the population above 50% of that at designation - loss of 50% or more is unacceptable.

- Lower limits for the Ribble & Alt SPA are: 9,479 bar-tailed godwit, 114 Bewick's swan, 2,138 golden plover, 79 whooper swan, 409 black-tailed godwit, 19,976 dunlin, 3,036 grey plover, 28,932 knot, 8,079 oystercatcher, 11,930 pink-footed goose, 1,666 pintail, 1,354 redshank, 1,429 sanderling, 2,051 shelduck, 3,820 teal, 42,349 wigeon, and 150,724 total waterfowl assemblage over winter (based on 50% of 5-yr peak mean 1991/2-1995/6) and 497 ringed plover (based on 5-year peak mean 1991/2-1995/6) and 3,086 sanderling (based on 3-year mean May 1993-1995) on passage.
- Lower limit for the SSSI: 10,571 lapwing and 642 curlew, based on 50% of 5-yr mean peak winter maxima close to designation (Boyes and Cutts 2008).

[Note these figures are for the whole SPA or SSSI, so only a proportion will be supported within the NNR]

Attribute: Diversity

Target: Maintain assemblage diversity: No loss of 19 species designated at national and international levels, though declines due to events beyond the boundary of the NNR/ SPA will not cause the site to fail.

Attribute: Disturbance in feeding and roosting areas

Target: No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline, subject to natural change.

Attribute: Absence of obstructions to view lines

Target: No increase in obstructions to existing bird view lines.

Attribute: Vegetation characteristics

Target: Vegetation height and extent of bare ground throughout areas used for feeding and roosting should not deviate significantly from an established baseline, subject to natural change.

Attribute: Food availability

Target: Presence and abundance of invertebrate prey should not deviate significantly from an established baseline, subject to natural change.

Target: Presence and abundance of soft-leaved and seed-bearing plants should not deviate significantly from an established baseline, subject to natural change.

Feature 6: Breeding bird assemblage

Attribute: Assemblage score (BTO index)

Target: Maintain assemblage diversity: If the total score calculated for a breeding bird assemblage falls by 25% or more in points from 1986 BTO index of 15, then the assemblage is in an unfavourable condition (i.e. if the BTO index falls to less than 12). The species present at designation do not need to be the same as this is a score based assessment only

Attribute: habitat extent

Target: Maintain the area of saltmarsh used by the feature within acceptable limits (estimated 1496.4 ha saltmarsh in units 2, 3 and 4). No loss of habitat on the NNR other than natural erosion caused by natural physical dynamics of the coastal system.

Feature 8: Saltmarsh

Attribute: Extent

Target: No decrease in extent from established baseline (2353.11 ha for SSSI measured by NVC, 2002)

Attribute: Vegetation structure

Target: Maintain zonations typical of the Ribble including pioneer (SM6, SM8), lower-mid (SM12, SM13, SM14) and mid-upper marsh (SM16), strandline (SM28) and transitional habitats (S4, S5, S20, S21, MG11); maintain areas of grazed and ungrazed saltmarsh where the grazed saltmarsh sward height is typically 2-5 cm for wintering bird interest and 5-15cm for breeding bird interest ungrazed saltmarsh sward height is typically 10-25 cm within low-mid marsh communities and up to 50+ cm where transitional habitats occur.

Attribute: Physical structure

Target: Realignment of creeks should be absent or rare; no further anthropogenic alteration of creek patterns compared to an established baseline.

Attribute: Vegetation composition - characteristic species

Target: Maintain frequency of characteristic species of saltmarsh zones as follows Pioneer zone - at least one listed species frequent and another occasional *Salicornia* spp, *Suaeda maritima*, *Puccinellia maritima*, *Aster tripolium*, *Aster tripolium* var *discooides*; Low-mid marsh - at least one of *Puccinellia maritima*, *Atriplex portulacoides* or *Salicornia* spp. dominant and two other listed species at least frequent *Triglochin maritima*, *Plantago maritima*, *Spergularia maritima*, *Aster tripolium*, *Suaeda maritima*, Turf fucoids; Mid-upper marsh - at least one listed species abundant and three frequent: *Festuca rubra*, *Juncus gerardii*, *Agrostis stolonifera*, *Limonium vulgare*, *Armeria maritima*, *Artemisia maritima*, *Aster tripolium*, *Juncus maritimus*, *Triglochin maritimus*, *Eleocharis uniglumis*, *Blysmus rufus*, *Seriphidium maritimum*, *Leontodon autumnalis*, *Carex flacca*, *Carex extensa*, Turf fucoids, *Suaeda verna*

Attribute: Negative indicators

Target: No recent evidence of expansion of *Spartina anglica* into pioneer saltmarsh (less than 10% expansion in the last 10 years); no obvious signs of pollution; turf cutting absent or rare; no increase in bare substrate as a result of anthropogenic activities such as vehicle use or trampling

at vulnerable locations (track, access points); poaching damage from stock or horses rare, with bare mud extent < 25%; artificial drainage channels adversely affecting hydrology are absent or rare.

Objective Methods:

A variety of grazing regimes will be employed over different parts of the site and at different times of the year to achieve the different requirements of the notable bird species. In winter most areas will be *Puccinellia maritima* dominated short-sward turf to favour feeding by the large populations of herbivorous wildfowl and roosting, though some areas with more structure will provide shelter for passerines. In spring and summer, a mosaic of short sward turf interspersed with scattered tussocks of longer vegetation is required for breeding birds. The recently erected fencing on Banks Marsh is helping to control grazing pressure to benefit breeding birds and experimental temporary fencing will be employed as appropriate elsewhere on the NNR to exclude grazing from principal bird-breeding areas. Further management options to benefit breeding birds will be investigated and implemented where appropriate. Work with BAE systems to manage the potential impact of large gulls on their business. Future employment of traditional-breed cattle will be investigated; both to improve the saltmarsh sward quality and to provide a herd which is better suited to the difficult saltmarsh conditions than the currently used dairy herds.

Stock will continue to be excluded from the area of ungrazed saltmarsh at Crossens/ Marshside. The grazing regime along the narrow strip of marsh at Beconsall Marsh will be reviewed, given the past difficulties encountered with grazing and its limited value for birds due to disturbance levels from the footpath which runs the length of this marsh.

References

- Boyes SJ & Cutts ND (2008) *Condition assessment of the Ribble Estuary SSSI: Aggregations of non-breeding birds*. unpublished report for English Nature.
- Gazzard J (2005) *Conservation objectives: Ribble Estuary SSSI*. English Nature unpublished report.
- Gee M (2003) *Ribble Estuary National Nature Reserve management plan*. English Nature unpublished report.
- The Environment Partnership (2003) *Ribble and Alt estuaries NVC survey 2002*. unpublished report for English Nature.

Likely Significant Effect: These proposals are necessary for nature conservation management of the site.

Monitoring Methods:

Annual monitoring of the estuary's migratory waterfowl population will continue through WeBS counts and wildfowl bag-return analysis. A programme of low-tide wader counts every 5 years will be reinstated.

Spring and summer monitoring of breeding bird species will be undertaken, particularly those species which have significant populations on the NNR including common tern, lesser black-backed gull, black-headed gull and redshank. Additional annual surveys will be required to map the extent of the black-headed and lesser black-backed and herring gull colonies. These are needed to inform consideration of potential bird-strike risks that the birds may present to aircraft using the neighbouring BAE Warton Aerodrome as well as the outcome of any measures taken to manage this issue. These surveys are also needed to evaluate the potential impact of the expanding lesser black-backed and herring gull colonies which may have displaced the black-

headed gull and tern populations.

Monitoring of the saltmarsh sward will be carried out to ensure a suitable range of short-sward and tussocky grassland is present.

Objective 2:
Maintain the extent of intertidal flats within the estuary in favourable condition, with particular respect to the internationally and nationally important bird populations
Features addressed by this objective:
2, 4, 6, 8 Aggregations of non-breeding, 10 Littoral sediment & associated biotopes
Attributes/targets for key features:
<p>Features 2, 4, 6 and 8 Aggregations of non-breeding birds</p> <p>Attribute: Total population</p> <p>Target: Maintain population within acceptable limits (in this context population can be that of an individual species or the total population of an assemblage): Based on the known natural fluctuations of the population in the site, maintain the population at or above the minimum for the site. Where the limits of natural fluctuations are not known, maintain the population above 50% of that at designation - loss of 50% or more is unacceptable.</p> <ul style="list-style-type: none"> • Lower limits for the Ribble & Alt SPA are: 9,479 bar-tailed godwit, 114 Bewick's swan, 2,138 golden plover, 79 whooper swan, 409 black-tailed godwit, 19,976 dunlin, 3,036 grey plover, 28,932 knot, 8,079 oystercatcher, 11,930 pink-footed goose, 1,666 pintail, 1,354 redshank, 1,429 sanderling, 2,051 shelduck, 3,820 teal, 42,349 wigeon, and 150,724 total waterfowl assemblage over winter (based on 50% of 5-yr peak mean 1991/2-1995/6) and 497 ringed plover (based on 5-year peak mean 1991/2-1995/6) and 3,086 sanderling (based on 3-year mean May 1993-1995) on passage. • Lower limit for the SSSI: 10,571 lapwing and 642 curlew, based on 50% of 5-yr mean peak winter maxima close to designation (Boyes and Cutts 2008). <p><i>[Note these figures are for the whole SPA or SSSI, so only a proportion will be supported within the NNR]</i></p> <p>Attribute: Diversity</p> <p>Target: Maintain assemblage diversity: No loss of 19 species designated at national and international levels, though declines due to events beyond the boundary of the NNR/ SPA will not cause the site to fail.</p> <p>Attribute: Disturbance in feeding and roosting areas</p> <p>Target: No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline, subject to natural change.</p> <p>Attribute: Absence of obstructions to view lines</p> <p>Target: No increase in obstructions to existing bird view lines.</p> <p>Attribute: Food availability</p> <p>Target: Presence and abundance of sub-surface invertebrate prey should not deviate significantly from an established baseline, subject to natural change.</p> <p>Target: Presence and abundance of eelgrass and/ or green algae should not deviate significantly from an established baseline, subject to natural change.</p> <p>Feature 7 Littoral sediment</p> <p>Attribute: Extent</p> <p>Target: No decrease in extent in area of littoral sediment from the established baseline, subject to natural change. (estimated 6584.58ha in SSSI using NVC and ENSIS)</p> <p>Attribute: Distribution and composition of biotopes</p> <p>Target: Maintain the variety and distribution of biotopes, allowing for natural succession or known cyclical change; maintain the species composition of representative or notable biotopes (including honeycomb worm reef).</p> <p>Attribute: Sediment character</p> <p>Target: Organic carbon content should not increase in relation to an established baseline;</p>

Objective 2:

average depth to the top of the black layer should not increase in relation to baseline; no change in composition of sediment type across the feature allowing for natural succession or known cyclical change.

Attribute: Topography

Target: No change in topography of the littoral sediment, allowing for natural responses to hydrodynamic regime.

Objective Methods:

The littoral sediments will essentially be left to the effects of natural coastal processes with no formal intervention management. However, Natural England will seek to influence other bodies to ensure that any risks to the littoral sediments, and its associated bird and invertebrate life, will be avoided, including any proposed changes to the physical dynamics of the estuary and discharge of pollutants.

References

- Boyes SJ & Cutts ND (2008) *Condition assessment of the Ribble Estuary SSSI: Aggregations of non-breeding birds*. unpublished report for English Nature.
- Gazzard J (2005) *Conservation objectives: Ribble Estuary SSSI*. English Nature unpublished report.
- Gee M (2003) *Ribble Estuary National Nature Reserve management plan*. English Nature unpublished report.

Likely Significant Effect: These proposals are necessary for nature conservation management of the site.

Monitoring Methods:

Annual monitoring of the estuary's waterfowl population will continue through WeBS counts and wildfowl bag-return analysis. A programme of low-tide wader counts every 5 years will be reinstated.

Monitoring of the littoral sediment invertebrate communities will be carried out periodically, as required under the conservation standard monitoring programme, to evaluate the health of the estuary and ensure the availability of invertebrate prey for the bird populations. Special attention will be given the monitoring the honeycomb worm reef which is a priority BAP habitat.

Objective 3:
Maintain the extent of coastal grazing marsh within the estuary in favourable condition.
Features addressed by this objective:
12 MG5 grassland and transitional brackish habitats
Attributes/targets for key features:
<p>Feature 8: MG5 grassland</p> <p>Attribute: Extent Target: Minimum 8 ha.</p> <p>Attribute: Sward structure Target: No more than 5% bare ground (not including rock). Total extent of litter no more than 25% of the sward. Sward height in excess of 5 cm (mid-May - late July).</p> <p>Attribute: Sward composition - positive indicators Target: 40 - 90 % herb cover. At least 2 species frequent plus at least 3 species occasional throughout the sward from: - <i>Achillea millefolium</i>, <i>Alchemilla spp.</i>, <i>Carex flacca</i>, <i>Centaurea nigra</i>, <i>Dactylorhiza spp.</i>, <i>Galium verum</i>, <i>Hypochoeris radicata</i>, <i>Lathyrus pratensis</i>, <i>Leontodon autumnalis</i>, <i>Leontodon hispidus</i>, <i>Leucanthemum vulgare</i>, <i>Lotus corniculatus</i>, <i>Luzula campestris</i>, <i>Pimpinella saxifraga</i>, <i>Prunella vulgaris</i>, <i>Potentilla erecta</i>, <i>Rhinanthus minor</i>, <i>Sanguisorba minor</i>, <i>Stachys officinalis</i>, <i>Succisa pratensis</i>. [Note this list of species varies from that provided in CSM guidance in being tailored to the typical MG5 species which were actually recorded during the 1999 NVC survey, together with other herb species indicative of a good MG5 sward which may also occur given appropriate management]</p> <p>Attribute: Sward composition - negative indicators Target: No one species more than occasional throughout the sward or singly or together more than 5% cover from: <i>Anthriscus sylvestris</i>, <i>Cirsium arvense</i>, <i>Cirsium vulgare</i>, <i>Galium aparine</i>, <i>Plantago major</i>, <i>Pteridium aquilinum</i>, <i>Rumex crispus</i>, <i>Rumex obtusifolius</i>, <i>Senecio jacobaea</i>, <i>Urtica dioica</i>. No more than 5% tree/shrub cover.</p> <p>Attribute: Indicators of local distinctiveness Target: Maintain populations of orchids (combined <i>Dactylorhiza fuchsii</i>, <i>D. incarnata</i> and <i>D. praetermissa</i>) at least occasional in the sward.</p>
Objective Methods:
<p>The reclaimed marsh at Old Hollow Meadows will be managed broadly by traditional meadow management methods, with cuts in mid and late summer followed by aftermath grazing from late November until early March, primarily to maximise the floristic interest of the meadows which includes the three orchid species. Creation of a short sward with some tussocky and wet areas in the early spring should additionally be attractive to certain breeding bird species including lapwing. Meadows are often poor in invertebrate numbers and diversity because of the severe impact of a single cut over the whole site, so staggering the cuts through the summer may help maintain numbers of invertebrate prey for birds, while leaving some areas to set seed late in the summer will benefit seed-eating birds.</p> <p>Controlling water levels by reinstatement of a sluice will seek to increase wetted margins of the meadow and establish reedbed as a transitional feature.</p> <p>Providing hedgerow around the dry margins of the meadows will further diversify the available habitats for breeding birds.</p>

Objective 3:

Work will continue on the lagoon, created on reclaimed marsh at Hundred End in 2008 to link this with the RSPB's habitat creation work at Hesketh Out Marsh, where grading of one of the banks will be carried out by the Environment Agency to create shallower water in which vegetation can establish. This area may need fencing to prevent cows from trampling the vegetation.

References

- English Nature (2001) *Ribble and Alt estuaries European Marine Site: English Nature's draft guidance given under Regulation 33 (2) of the Conservation (Natural Habitats & c.) Regulations 1994 - Council draft*. English Nature unpublished report.
- Gazzard J (2005) *Conservation objectives: Ribble Estuary SSSI*. English Nature unpublished report.
- Gee M (2003) *Ribble Estuary National Nature Reserve management plan*. English Nature unpublished report.
- Skelcher G (1999) *NVC survey of Old Hollow Meadows, Ribble Estuary NNR*. unpublished report for English Nature.

Likely Significant Effect: These proposals are necessary for nature conservation management of the site.

Monitoring Methods:

Monitoring in Old Hollow Meadows will include annual counts of orchid spikes, updating the list of meadow plant species, periodically confirming the diversity of vegetation (NVC) communities and monitoring the breeding bird populations.

Monitoring of vegetation changes will also be undertaken at the newly created Hundred End lagoon.

2.4.2 Landscape and Cultural Objectives

Objective 4:
Encourage use of the NNR for recreational activities, where these do not damage the nature conservation interest, and support partner organisations in promoting access to the wider estuary and enhancing the nature conservation value of the estuary.
Features addressed by this objective:
20 Community involvement, 21 Education, 24 Public access, 19 Economic use (1 - 9 & 13 Aggregations of non-breeding birds and breeding birds, 10 Littoral sediment, 11 Saltmarsh, 12 Coastal grazing marsh)
Attributes/targets for key features:
<p>Feature 24: Public Access Attribute: Accessibility Target: Targets to be determined</p> <p>Attribute: Visitor satisfaction Target: Targets to be determined</p>
Objective Methods:
<p>Public access and appreciation of the NNR will be developed through guided walks, lectures to interested groups, provision of interpretation and providing information on an <i>ad hoc</i> basis as required. Work will also be undertaken with neighbours and partner organisations to further develop access facilities to the estuary as a whole and enhance its wildlife value, particularly along the uppermost part of the marsh and in projects to restore or create transitional habitats in existing reclaimed marsh. Specific projects include the establishment of the Ribble Coast and Wetland Regional Park and the RSPB habitat creation development at Hesketh Out Marsh.</p> <p>Estate fabric required for public access and bird recording will be maintained in a safe and functional condition.</p> <p>Controlled wildfowling will continue to be permitted with consideration for public safety and impact upon bird populations. A review of the various impacts of wildfowling on the NNR will need to be carried out prior to the next licence renewal.</p> <p>References Gee M (2003) <i>Ribble Estuary National Nature Reserve management plan</i>. English Nature unpublished report.</p>
<p>Likely Significant Effect: These proposals are not necessary for nature conservation management but will have no significant effect on the internationally important nature conservation features of the site.</p>
Monitoring Methods:

Objective 5:
Encourage the development of the site for education, study and research projects, particularly where these contribute to the understanding of the site and its associated habitats and species
Features addressed by this objective:
20 Community involvement, 21 Education, 22 Research, 23 Demonstration
Attributes/targets for key features:
Objective Methods:
Use of the site for education and research by educational establishments and individuals will be encouraged as opportunities arise where such activities are not damaging to the key features of the site. Lecture, talks and displays will be provided to public groups and educational establishments as requested, where staff resources allow.
References Gee M (2003) <i>Ribble Estuary National Nature Reserve management plan</i> . English Nature unpublished report.
Likely Significant Effect: These proposals are not necessary for nature conservation management but will have no significant effect on the internationally important nature conservation features of the site.
Monitoring Methods:
A register of research projects will be maintained.

2.4.3 Estate Asset Objectives

Objective 6:	
Maintain the NNR property/ estate in a satisfactory condition and ensure all legal and statutory obligations are honoured	
Features addressed by this objective:	
24 Public access, 25 Office, 26 licences	
Attributes/targets:	
Feature 26: Licences & conveyances <i>Attribute:</i> Compliance with legal obligations and terms of above <i>Target:</i> 100% compliance	
Objective Methods:	
<p>All machinery will be maintained and serviced regularly. All buildings will conform to HASAWA regulations. All boundaries and estate fabric will be maintained in a safe and effective condition.</p> <p>Defined access routes will be maintained and NNR property in the vicinity of paths will be maintained in a safe and satisfactory condition.</p> <p>A positive working relationship with wildfowl associations will be maintained to ensure that wildfowling is carried out safely and within the terms of the lease, as well as promoting best management practices.</p> <p>A positive working relationship with BAE Systems will be maintained to ensure productive dialogue regarding the potential bird strike issue.</p>	
<table border="1"> <tr> <td>Likely Significant Effect: These proposals are not necessary for nature conservation management but will have no significant effect on the internationally important nature conservation features of the site.</td> </tr> </table>	Likely Significant Effect: These proposals are not necessary for nature conservation management but will have no significant effect on the internationally important nature conservation features of the site.
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Monitoring Methods:	
Ensure that all operations, facilities and equipment conform to HASAW regulations. Ensure that all operations, facilities and equipment conform to RIDOR regulations. Ensure that all operations, facilities and equipment conform to UKWAS regulations	