

Needingworth Quarry Wetland Project

**“A vision of the future
recreating the past”**



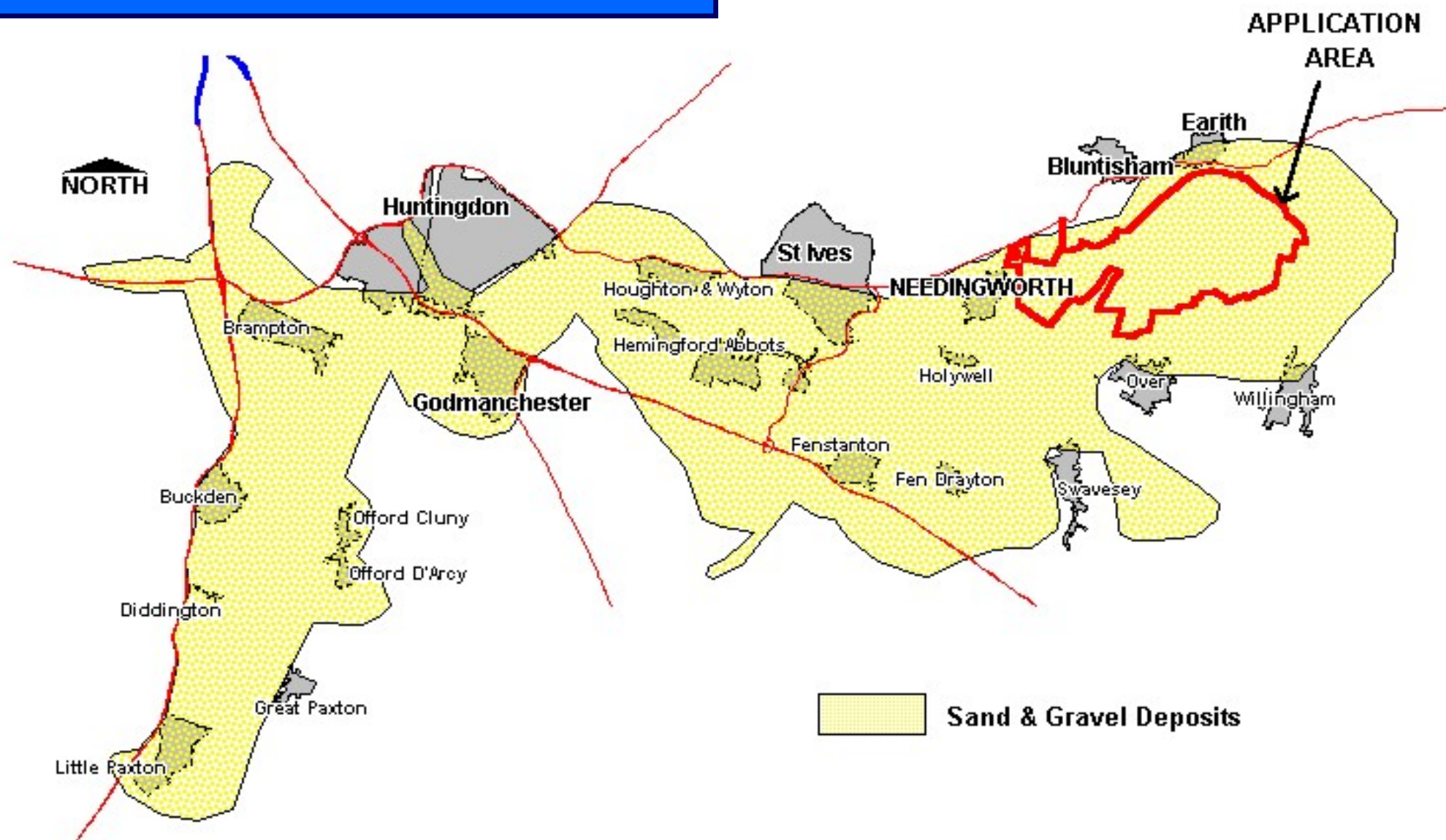
SAND & GRAVEL DEPOSITS OF THE GREAT OUSE VALLEY



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County Council



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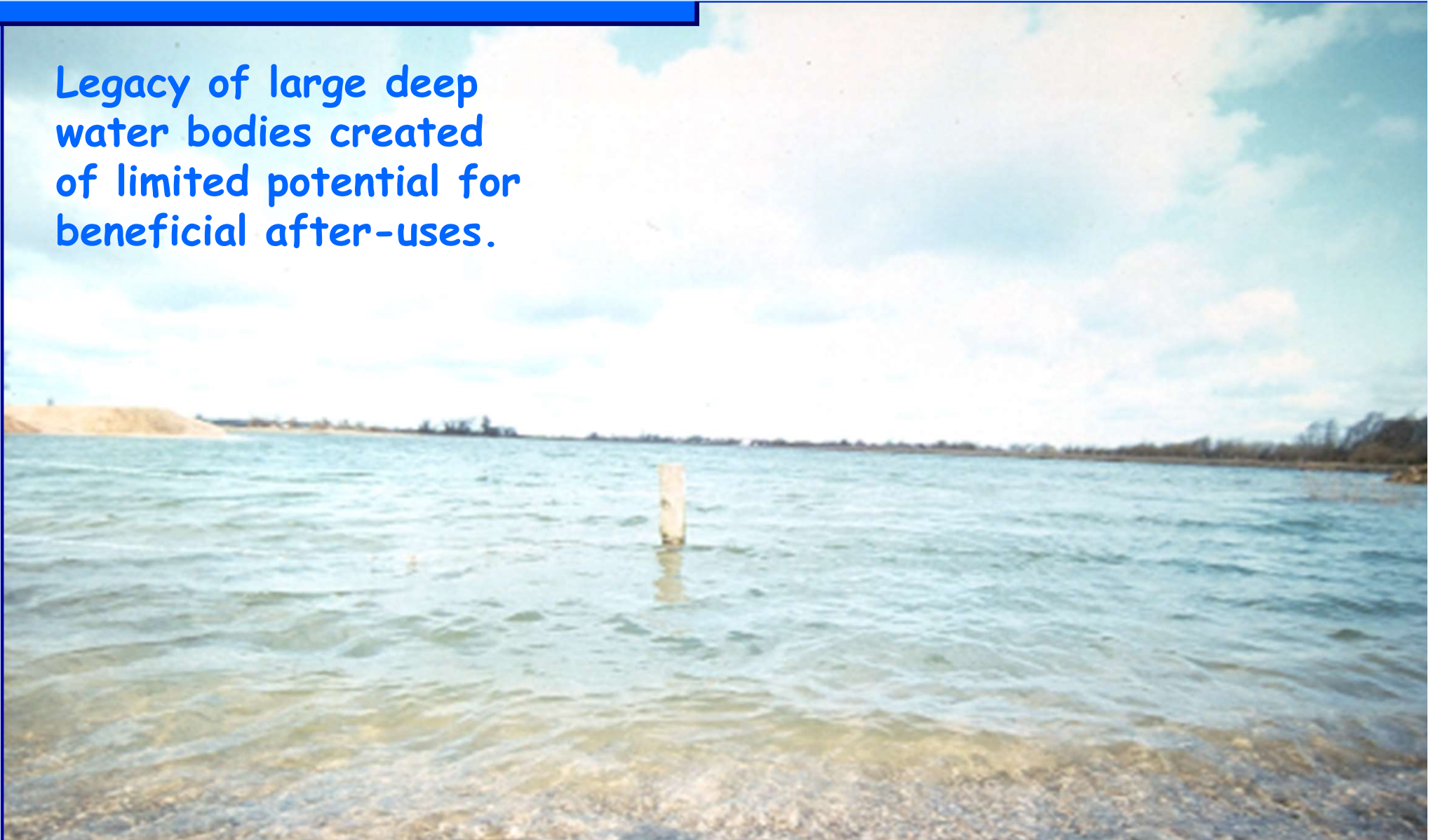
SAND & GRAVEL DEPOSITS OF THE GREAT OUSE VALLEY



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Legacy of large deep
water bodies created
of limited potential for
beneficial after-uses.



MINERAL PLANNING AUTHORITY RESTORATION POLICY OBJECTIVES



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Cambridgeshire Aggregates (Minerals) Local Plan

CALP 17:

Require restoration to agriculture or forestry unless it can be demonstrated that the benefits to the community would be greater.

CALP 18:

Where restoration to original ground levels is impractical, the County Council will normally require restoration to agriculture at low level.



1991 DEVELOPMENT PLAN ALLOCATION



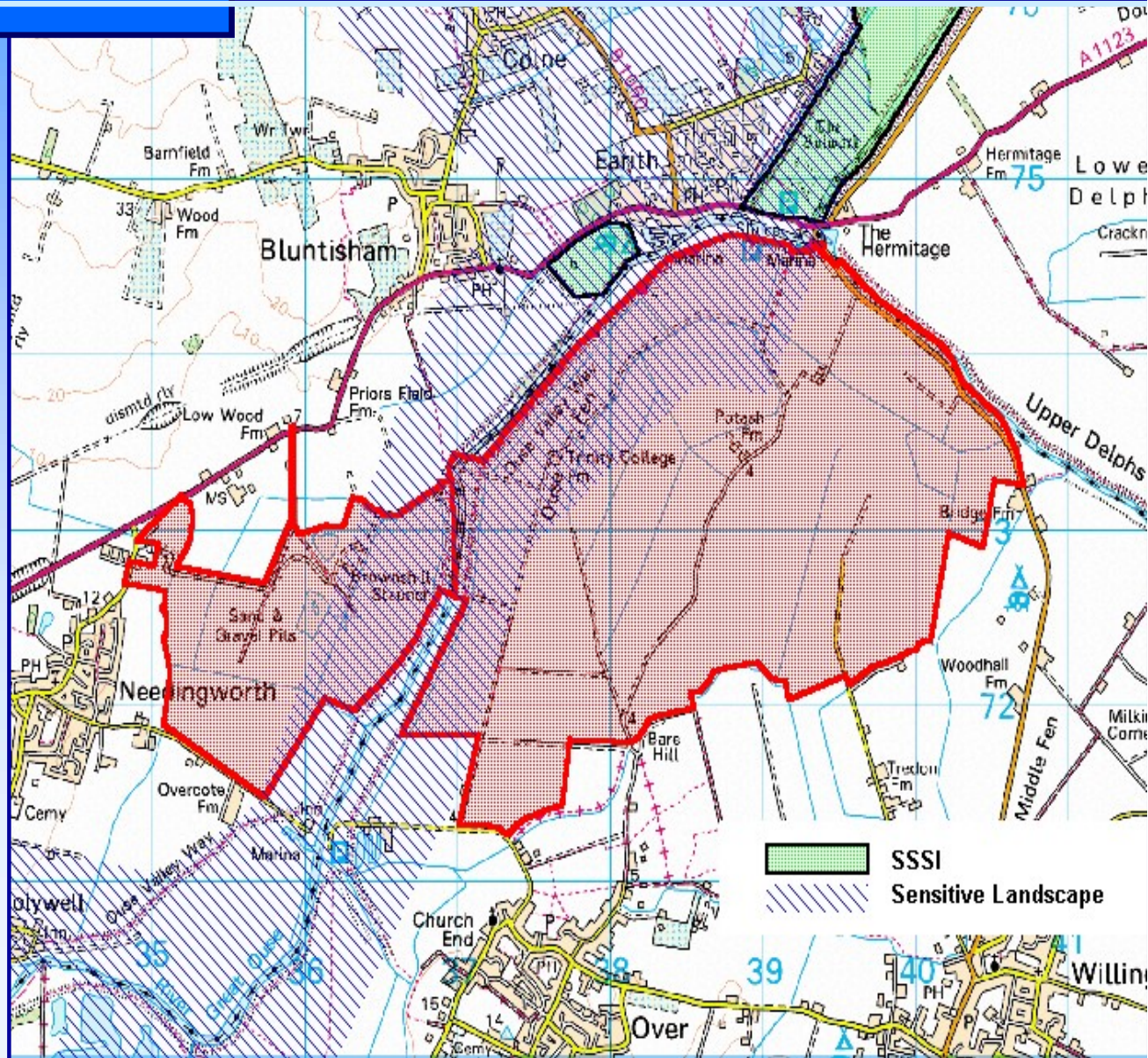
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- Site specific extension to an existing small low capacity ARC quarry site.
- Large area of search east of river, but with the following CONSTRAINTS.
Vehicular access.
Areas of conservation interest.
(Berry Fen SSSI & Ouse Washes SSSI, Ramsar, SPA)

Sensitive landscape
(In river corridor)



NATURE CONSERVATION

- Alternative scheme



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To establish a wetland of at least national importance which will make a substantial contribution (c.40%) to achieving the UK Government's Biodiversity Action Plan targets for reedbeds and bitterns and support the characteristic assemblages of plants and animals which were once widespread in the Fens.



NATURE CONSERVATION

- RSPB Objectives



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- To contribute to the alleviation of Ouse Washes Summer Flooding.
- To enhance the landscape through wetland creation and management.
- To provide informal recreational opportunities for the benefit of local communities and visitors.
- To provide an educational resource which will foster wider interest in, and support for, biodiversity and conservation.
- To provide a best practice example of beneficial conservation after-use following large-scale mineral extraction.

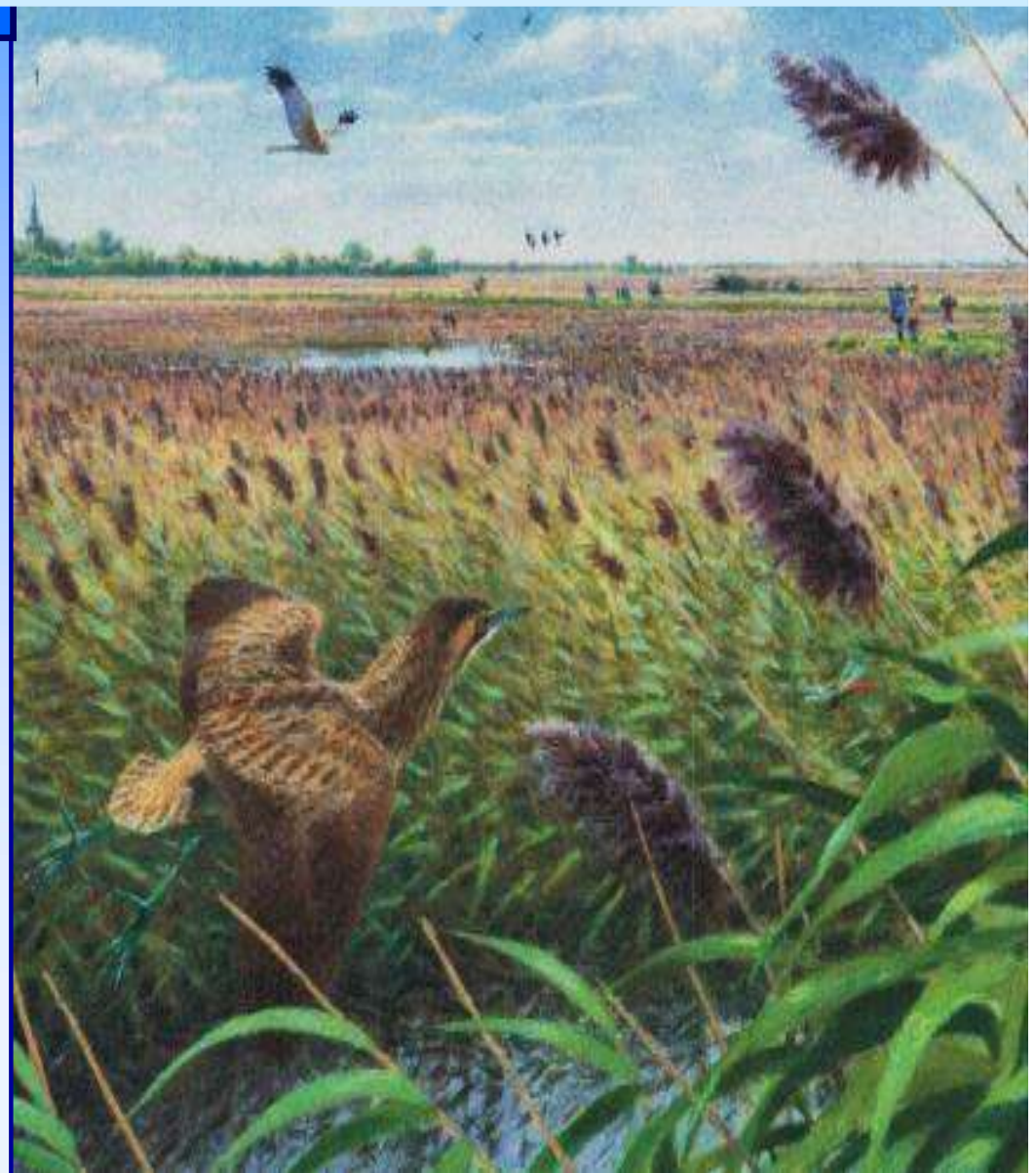
Objectives...



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- 1) A Clearly targeted strategy for restoration to a nature conservation afteruse - the re-creation of wetland reed-bed habitat which is a national regional and local priority habitat.
- 2) A potential new landscape respecting the open landscape character of the Fens particular appropriate to Cambridgeshire as before the drainage of the Fens from the 15th Century significant tracts of the County had a wet fenland landscape.



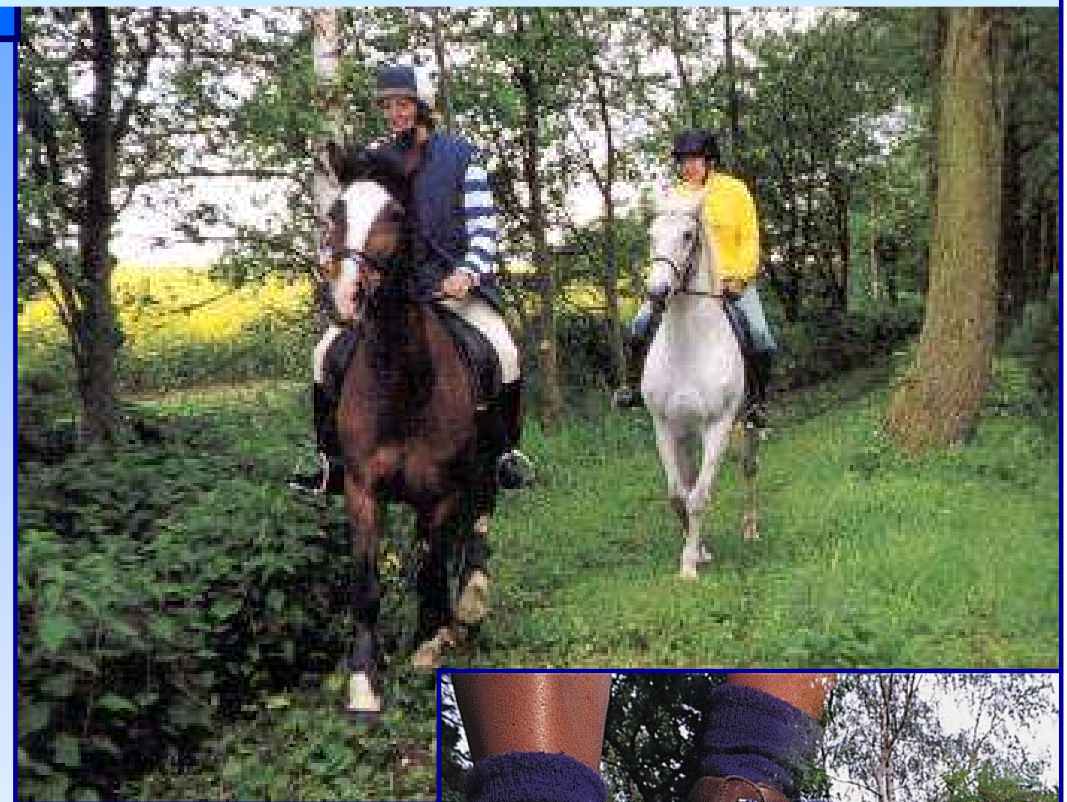
Objectives...



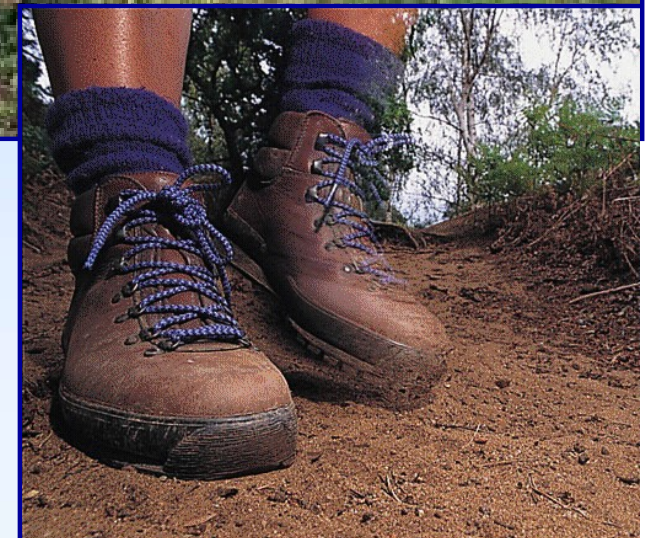
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3) Potential for increased public access for informal recreation by cycle, horse and foot.



4) Potential for informal recreation for local people and tourism benefits from visitors.



Objectives...



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5) Potential as an educational resource for schools and further educational establishments.



FEASIBILITY STUDY AS A BASIS FOR INFORMAL CONSULTATION



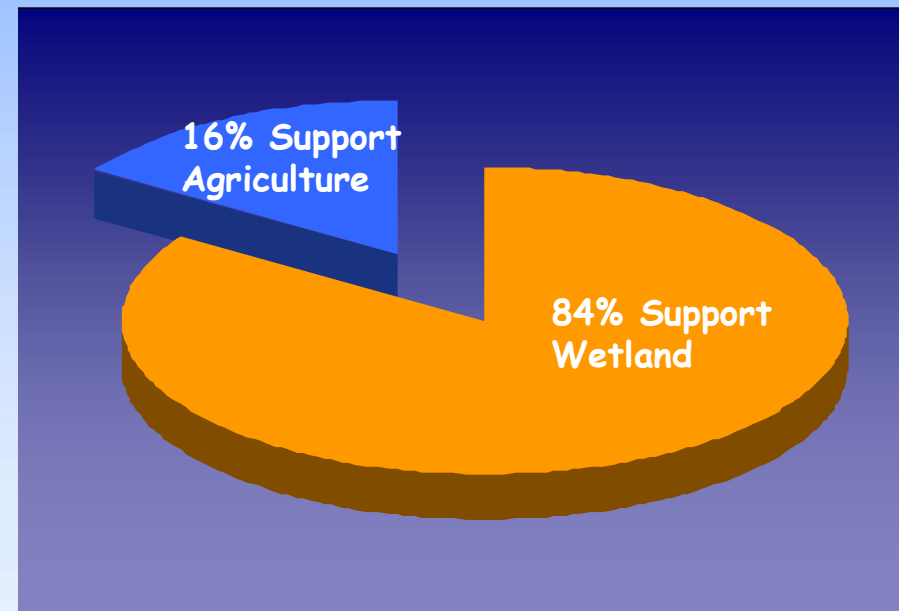
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Invitation to comment on the draft
concept scheme raising concerns and
identifying opportunities.

434 responses from
the local communities.

365 offering support for
the wetland scheme



NEEDINGWORTH WETLAND PLANNING DECISION

- a summary



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- A Major New Wetland
- Use of National Biodiversity Targets
- Importance of a shared long term vision
- Enhancements of the rural environment
- Significant community benefit
- Committed Conservation Organisation
- MPA- Enabling, co-ordinating, communicating and regulation

Restoration Design:

Habitats	(approx size)
reedbed (including meres)	460ha
wet grassland	150ha
dry grassland	100ha
woodland	8ha



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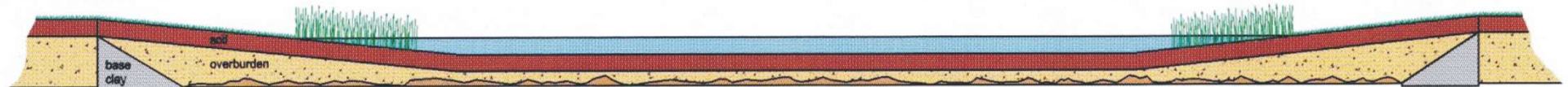
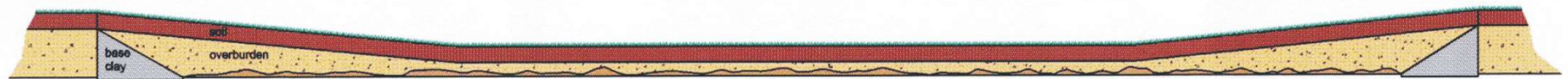
HANSON DESIGN & ENGINEERING FEASIBILITY



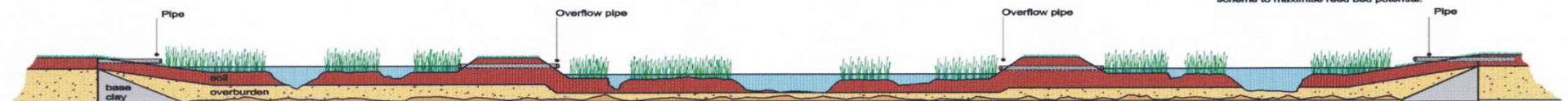
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Low level agricultural restoration.
Perimeter embankments sealed with base clay to prevent ground-water ingress.



Low level reed bed cell scheme.
Retains perimeter clay seals but creates a stepped landform with associated irrigation scheme to maximise reed bed potential.





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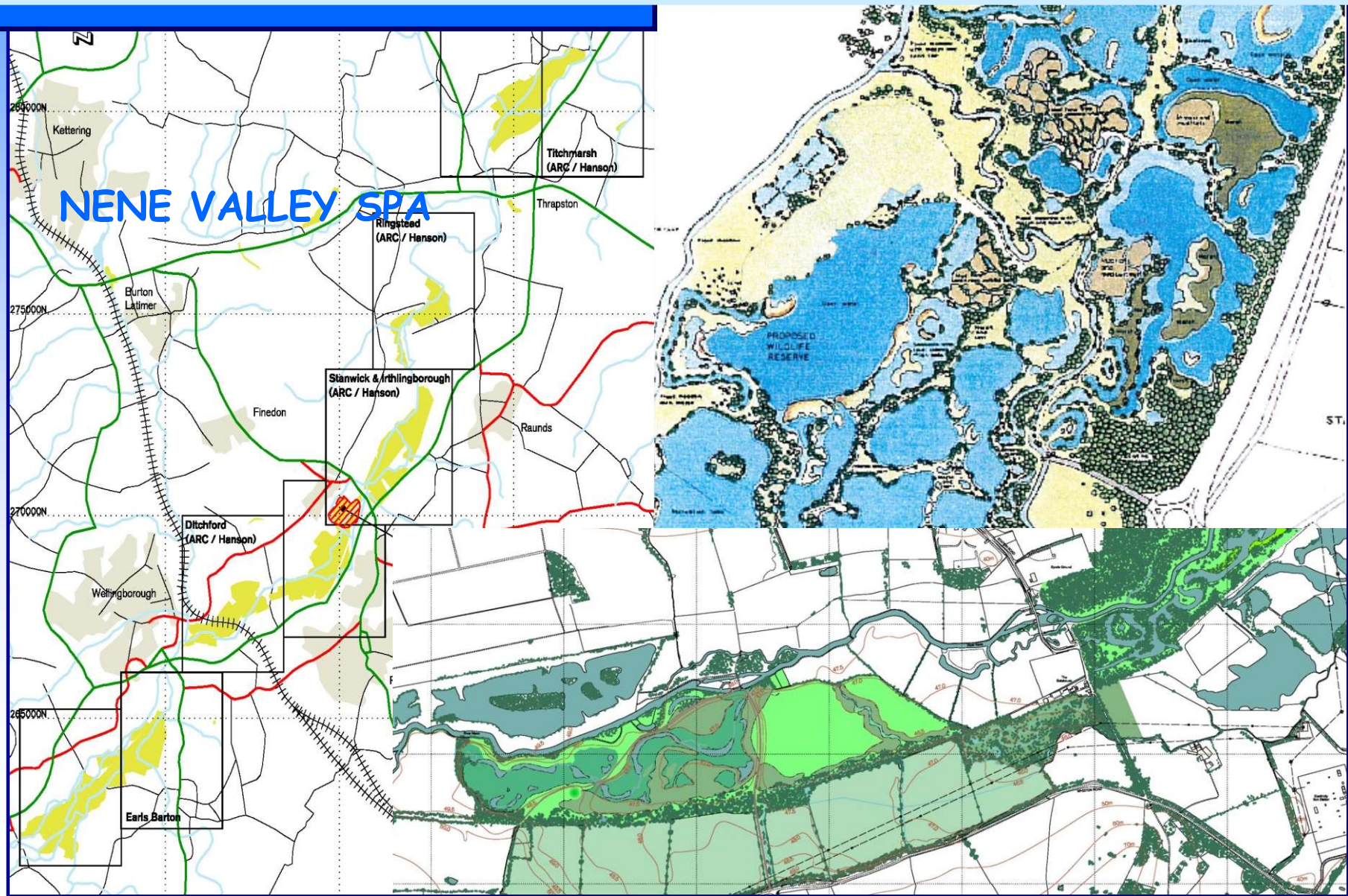




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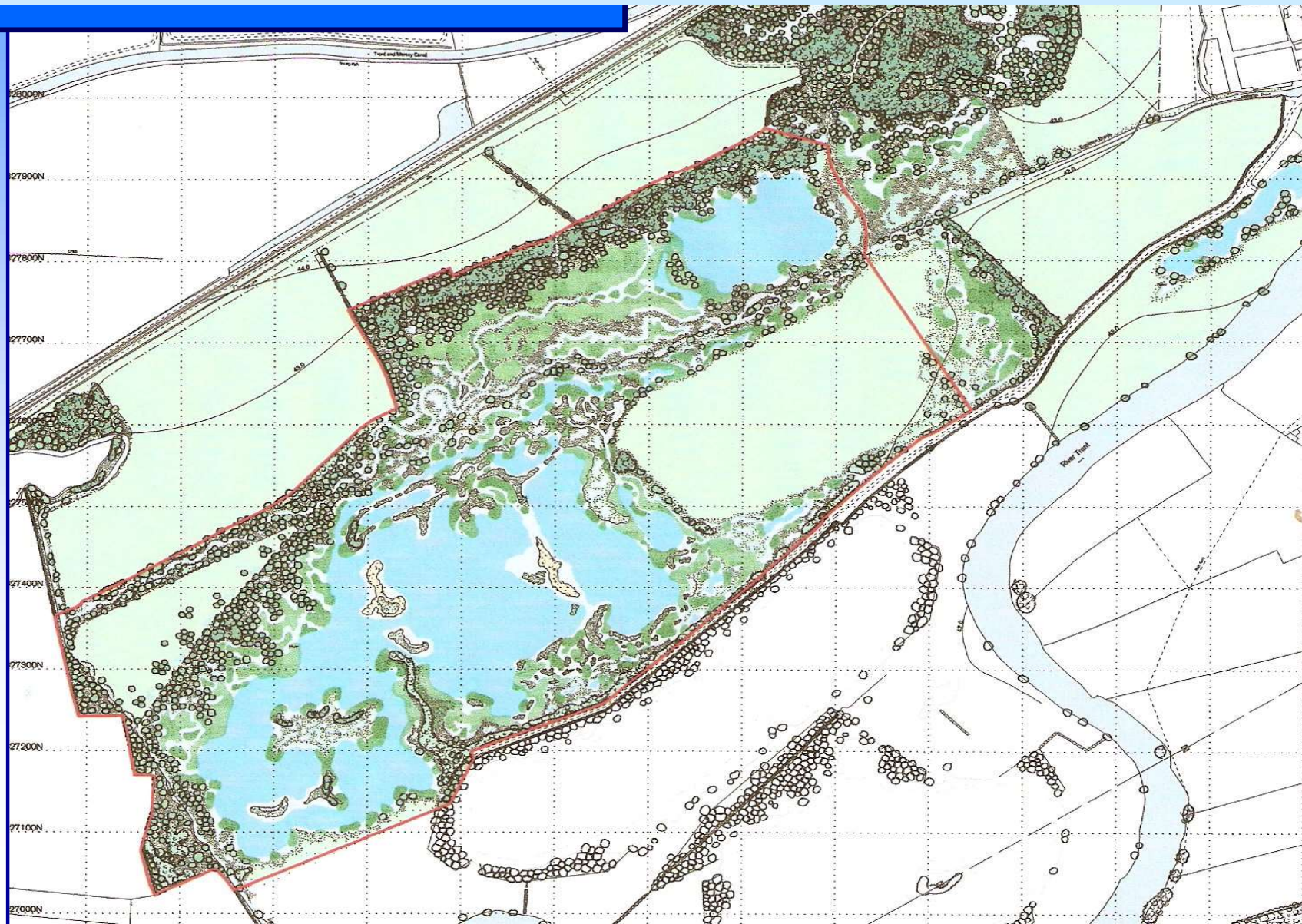
REPTON (Derbyshire Wildlife Trust)



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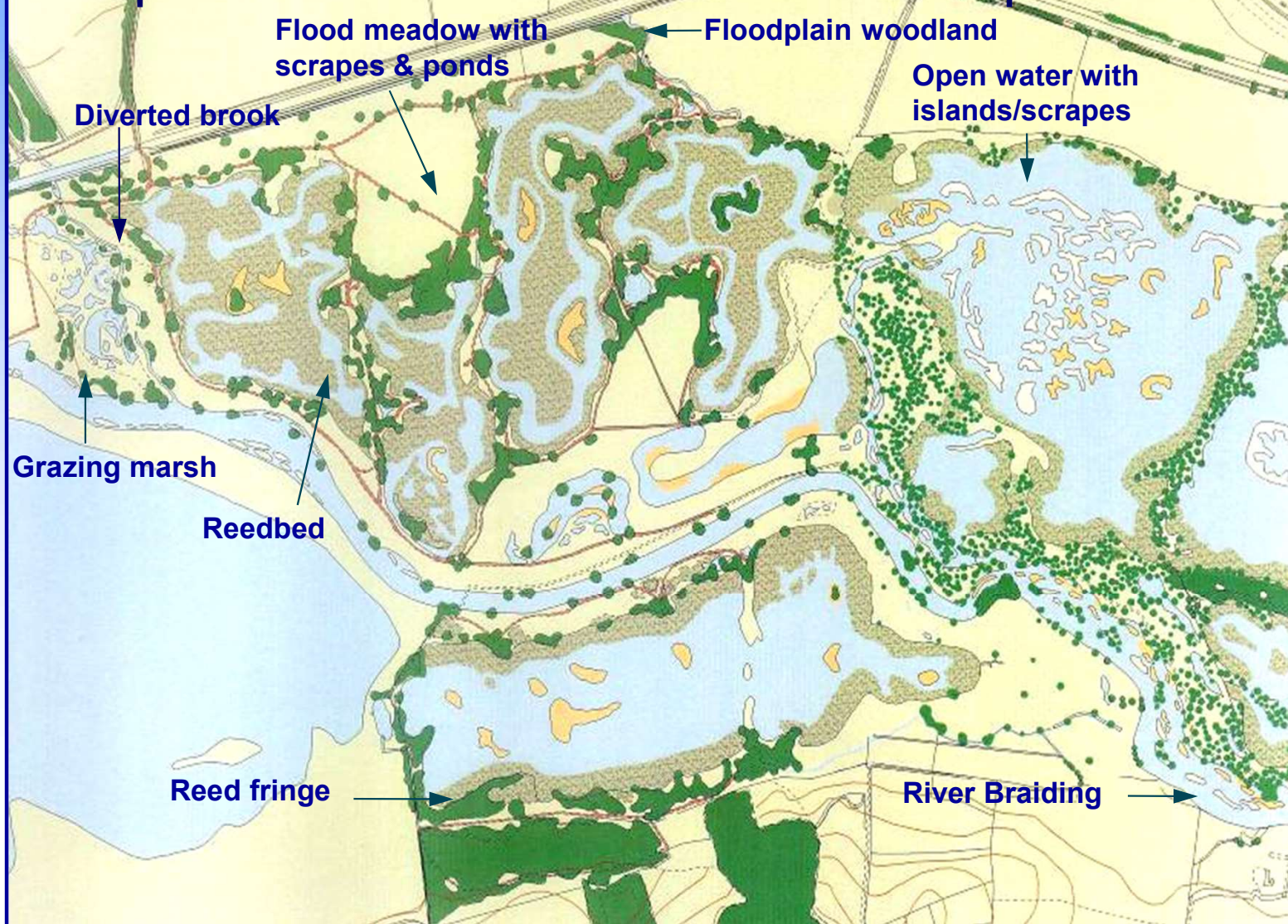
MIDDLETON HALL (RSPB)



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Floodplain wildlife habitats from naturalised landscape features





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REEDBED LANDFORMING



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- Maximum area and edge effect = maximum biodiversity
- Restoration to reduced levels to avoid summer drying
- Complex microtopography



REEDBEDS

(reedswamp, fen and open water)



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- Planting turves and large clumps is best.
- A reedbed of over 20ha is ideal, but narrow fringes and newly transplanted turf clumps are also important habitat.
- Within a year of planting the clumps are well established.
- Meandering deep channels maintain flowing open water and the all-important reed/water interface.
- Undulating microtopography ensures optimum water depth occurs somewhere.
- Shallow margins provide the fish-hunting habitat that Bittern need.
- Protection from wildfowl grazing using chicken mesh is effective.
- Reduced landform allows for years of thatch accumulation - for low intervention management.
- Thatch and dry reed also has value.



FLOODPLAIN LANDSCAPE AND HABITAT FEATURES



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Mosaic of 'natural' features:

- deep open water
- shallows
- reedswamp/fen
- carr
- bare ground
- marsh
- tall grass and herb
- scrubland
- wet woodland

↓
Ecological succession

Farmland features:

- inundation floodmeadow
grassland, marshes
scrapes and ponds
- hedges and ditches

Native species establishment via:

- natural regeneration
- transplanting
- planting



PONDS AND DITCHES



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- instant habitats and wildlife results
- variable water sources
- variable microtopography/levels
- maximum water edge effect = maximum biodiversity
- seasonal ponds that dry are frequently used as breeding sites by amphibians within the first year of restoration
- amphibians only need some sloping sides
- water voles need steeper banks
- permanent ponds often support a small fish population, exploited by duck, herons and kingfishers
- sun or shade for diversity



PONDS WITHIN GRASSLAND

(sustainable conservation wet grassland via ponding)



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- variable compaction and substrate
- reinstate river-floodplain connectivity to encourage frequent flooding
- reinstate and retain a high water table for marshland
- restore landform levels below O.G.L.
- maximise ponding for water table retention and recharge
- varied interventionist management:
eg tussock grassland for nesting habitat via low intensity flood meadow grazing or mowing
- minimal intervention = 'natural grazing'





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SCRUB AND FLOODPLAIN WOODLAND



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- 1. Landform decompaction = access to water and air for maximum growth
- 2. Varied microtopography = natural tree patterns and species diversity
- 3. Dead wood habitat for instant ecological value
- 4. Maximum edge effect with complex outline and internal glades with associated habitats:-
 - eg. permanent and temporary ponds
 - open water, grassland, marsh, fen etc
 - microhabitats ie. flood debris, leaf litter, boulders, varied substrates, log piles, nesting holes etc
 - open structure
 - best use of silt lagoons



FLOODPLAIN DIVERSITY = BIODIVERSITY



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Essential food chain species diversity from a mosaic of habitats exhibiting all stages of ecological succession - results from variety in:

- landform topography
- microtopography
- substrate
- water sources
- water level fluctuations
- water depth
- water flow
- shelter
- aspect
- spatial form and arrangement of habitats

