

Appendix C

Case Study Site Proposals

RSPB Langford Lowfields



Case Study 1a

Improved Visitor Experience and Destination at RSPB Langford Lowfields

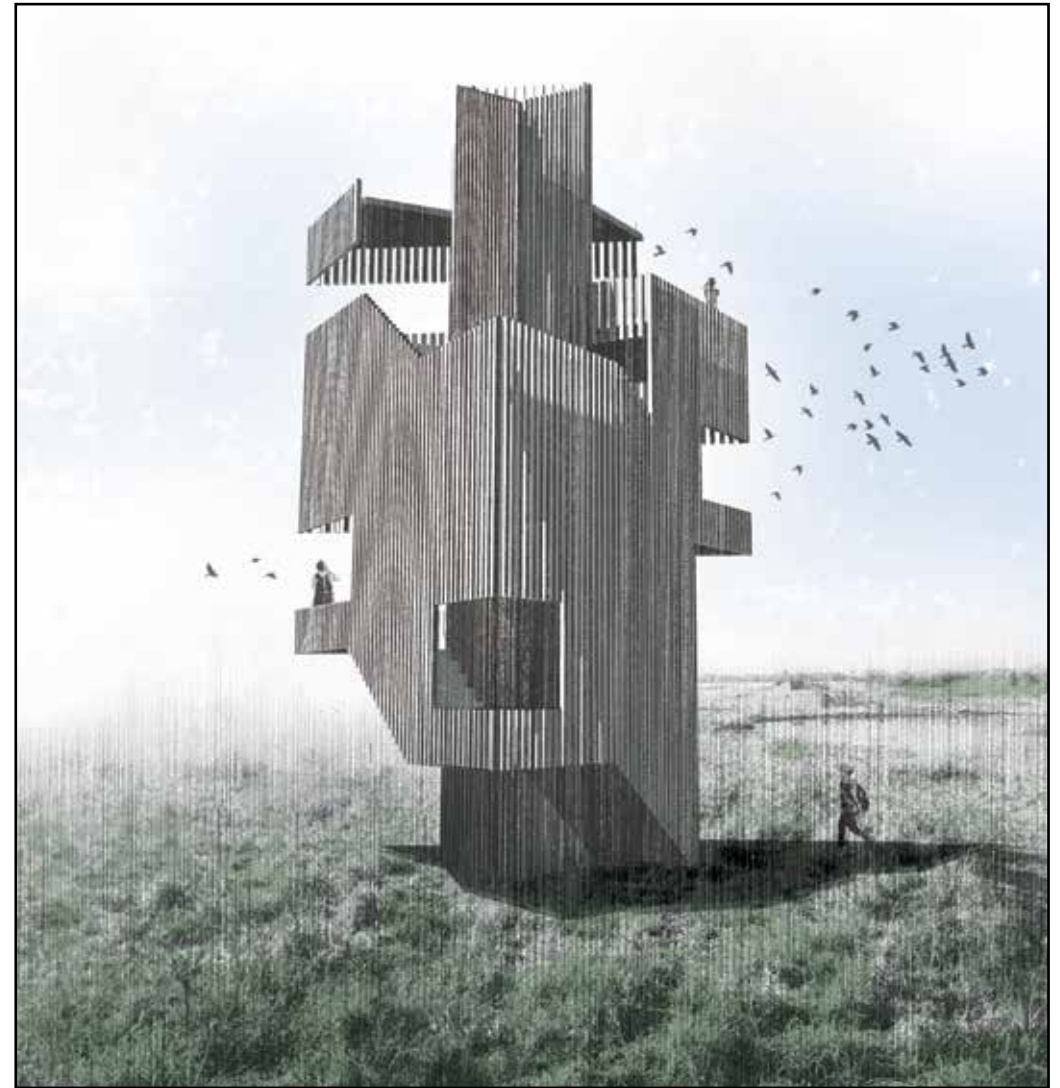
Langford Lowfields is a partnership project between Tarmac and the RSPB showcasing large wetland habitat creation as part of the restoration of a sand and gravel quarry on the banks of the River Trent. This is habitat creation on a huge scale. A significant feature of the reserve is its reed bed but it also has wild flower-rich meadows, areas of dense thorny scrub and a small mature woodland. This expansive reserve, is inhabited with various species of wildlife including bitterns, brown hares, bearded tits, marsh harriers, avocets, wintering wildfowl and has seasonal starling murmurations. Work carried out during 2017 and 2018 added a further 35ha of wetland habitat to the site. In time this will succeed to reed bed, but for the next few years will provide excellent habitat for wading birds. With the quarry set to expand over the next few decades, the reserve too will only get bigger.

The habitats at Langford Lowfields are constantly developing as the site continues to establish. Parts of the site have only just been restored and provide large areas of bare mud surrounded by deep water, in time these will develop into reed bed, but this process will take a number of years. The reserve is expected to expand in size over the next few decades following Tarmac's development of the area between the west of the existing works and the river. Following the principles of the RSPB Bigger and Better document there will be opportunities to create more reed bed, scrapes, wet woodland and potentially an area of floodplain wet grassland and a braided backwater channel connected to the River Trent, which will benefit and add to the existing mosaic of habitats.

To increase the opportunities for the visitors of Langford Lowfields to observe the vast area of reserve there is an aspiration to create a viewing tower and bird hide so that they would be able to see across the whole site much of which is not accessible by foot or visible from ground level. In addition the tower would provide long distance views up and down stream of the river.

The tower hide would stand at around 10m tall and could be constructed with a galvanised steel frame and clad with wooden battens.

When studying the surrounding context, the visitor will be able to observe the neighbouring villages and their towering church spires. These spires are visual markers within the immediate context, sitting tall within a fairly level and low lying landscape.



Concept design for observation tower and hide





Concept design for observation tower and hide





Current extents of the site. It is anticipated that the site will extend towards the river in coming years.

With the spires being so prominent within the landscape, the architectural vision looks to take inspiration from these landmarks and become a contemporary addition to the landscape.

By mapping out key views that surround the marshlands, opportunities from viewing decks were discovered deciphering the situation and directing the position of the look outs within the structure. A series of directional landings were developed with a mind to open up the structure to highlight and frame key views. The landings have been developed to look out primarily over the River Trent to the west of the site, the neighbouring villages and the immediate marshland reserve.

By opening up the structure within these specific areas, visitors will be encouraged to partake on a journey up through the structure, past each vantage point until making their way to the top where they will find a semi sheltered deck with a panoramic view. The top deck provides an area of shelter and an un-covered area to watch birds overhead.

By taking inspiration from key views, context and the local spires, the design sees a holistic approach to generate a key landmark with architectural merit to add to this landscape for the RSPB and its visitors to enjoy.



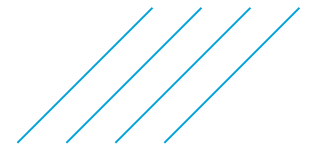
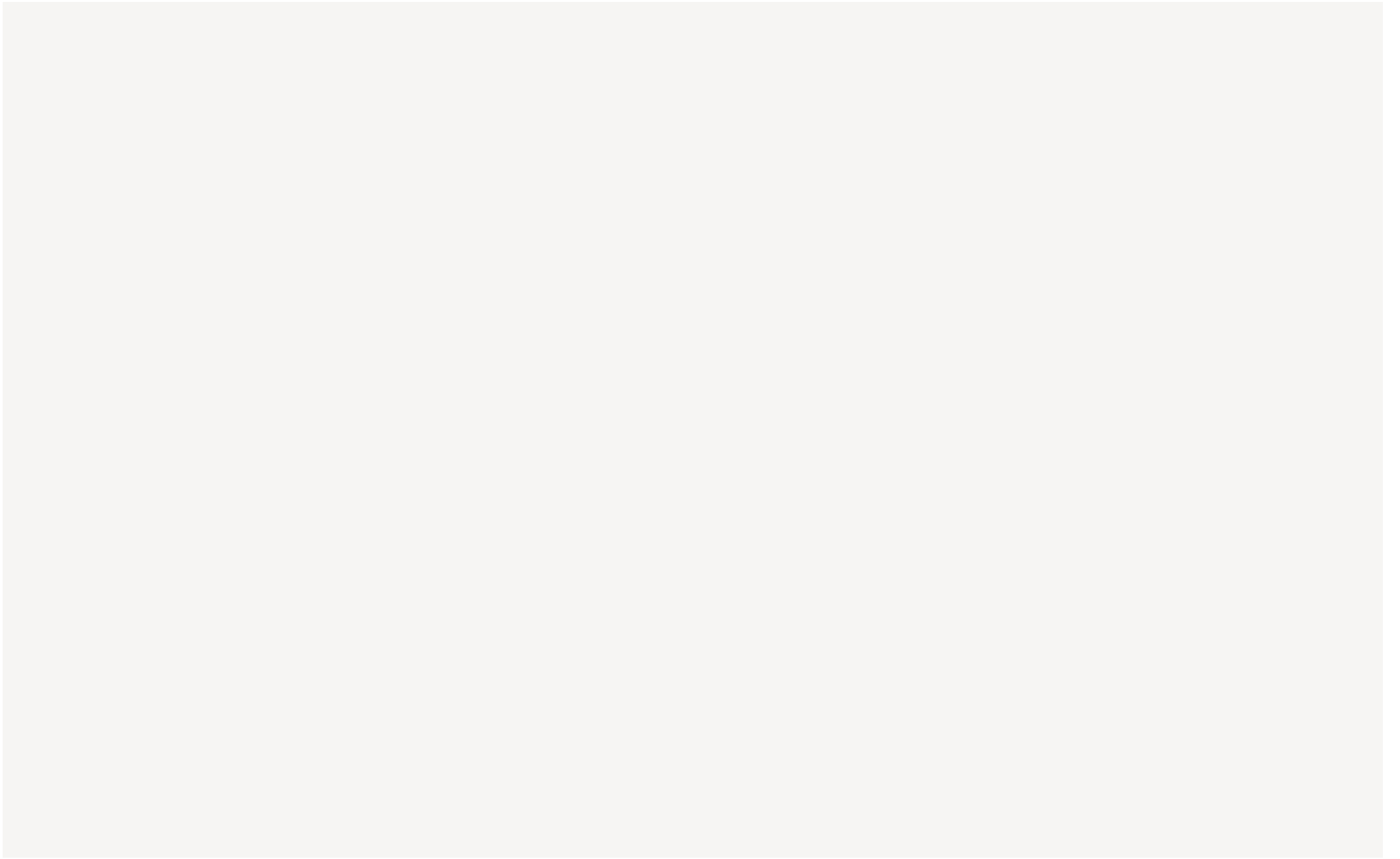
Views across the reserve

What might it cost?

Observation tower/bird hide Steel frame, timber cladding	£158,400
Preliminaries @20%	£31,680
Contingency @20%	£31,680
Total	£221,760

The cost above is an indicative price for budgetary purposes based on a concept design. It includes materials and construction. A final cost would be ratified following detail design and tender.





Case Study 1b

Improved Visitor Experience and Destination at Colwick Country Park

Colwick Country Park is a 250 acres woodland, grassland and lake located within the outskirts of Nottingham, it is owned and managed by Nottingham City Council and attracts visitors from the city and further afield. In addition to hosting events such as weekly Park runs (over 300 runners) and the annual 'Detonate festival' which attracts around 15,000 visitors, there is also an adventure centre, that works with schools in the city and across the county, offering high rope climbing, water-based activities and a summer camp programme. The Park holds outdoor film shows and hosts religious festivals both of which attract hundreds of people. Other attractions include open water swimming, model boat club, angling and a wildlife group. River trips are run from the adjacent Marina.

The local catchment area for the park is made up of predominantly of Asian and Eastern European communities. Housing is mainly terraced properties with no gardens or green space making the park a vital community resource.

The park attracts high numbers of visitors and is the only Park in the Nottingham district where B.B.Q.s can be held in the summer.

It has been proposed that the Country Park looks to develop how it engages with its visitors and community through the design of a brand new, visitor/education centre and cafe and through the improvement of the existing facilities.

The centre would be multi-functional providing a centre for education, a space to tell the story of the River Trent in terms of its natural heritage and its historic features and architecture and could be available for hire as an events space.

Holme Sluices adjacent to Colwick Country Park, is an Environment Agency asset which controls water levels on the River Trent. The asset forms the largest single restriction to fish passage on the River Trent. The EA is currently designing one of the largest fish passes to bypass the sluices. The fish pass will provide added interest for visitors to the park, providing them with the ability to observe fish passing at close quarters and focus in on the environment and wildlife in the area. It is hoped that the fish pass will be an added attraction to bring people to the Country Park visitor centre where they can be educated about and be brought directly in touch with the ecology and wildlife of the river.



Colwick Country Park

The visitor centre could be sited at several locations throughout the site, but initial studies suggest a favourable location would be either near the existing entrance and car park to exploit existing services and parking or adjacent to the new fish pass location to provide a focal point across the lake when entering the site from the road access.

The architectural essence to the scheme sees a jetting shed like structure slipping out towards the lake. The exoskeleton structure holds host to decked areas for the opportunity of a wide range of uses from pond dipping platforms to external café patio. With the structure 'floating out from the shore', solid spatial masses remain present on land to host a wide range of functions like gallery spaces and educational rooms. The visitor centre hub has been designed in mind of being a place of learning and recreation, and collectively, for the community. With café facilities alongside the educational rooms and small gallery spaces, the hub will allow visitors and the community to learn about the history of the River Trent with the opportunity to relax and take in the scenery over the park's lake.





Concept design for Visitor Centre





It's potential position towards the south easterly corner of the lake links the visitor centre with the proposed fish pass. This gives opportunity for visitors to explore and learn about the fish pass gaining a further insight into not only the River Trent's past, but its future too. The visitor centre could be a catalyst for encouragement of engagement with communities and the river through interpretative and engagement programmes during the proposed design process.



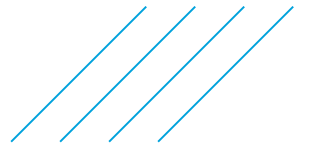
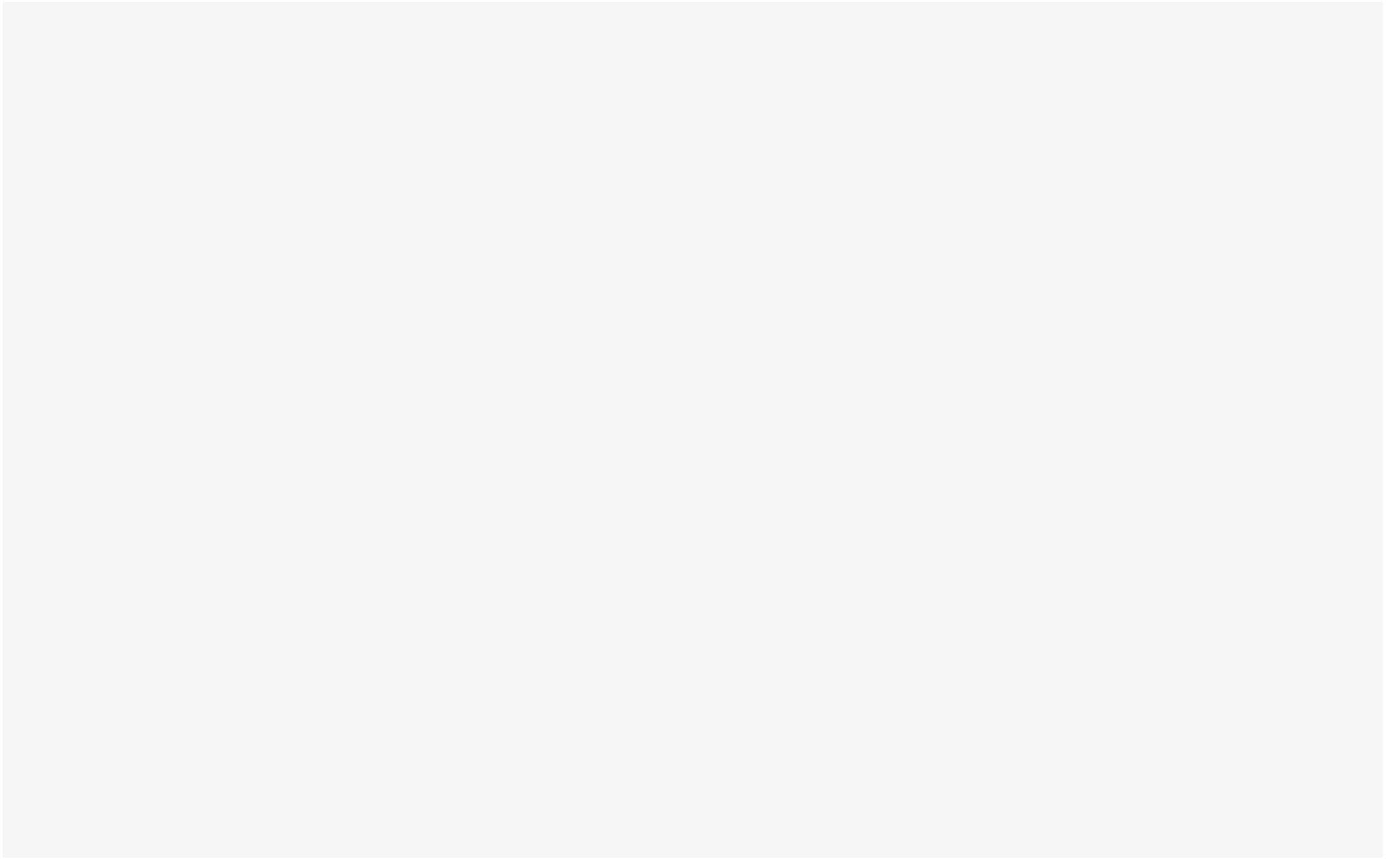
- Existing entrance and potential site for visitor centre
- Alternative site for visitor centre
- Site for new fish pass

What might it cost?

Visitor Centre 972m2 timbre frame, insulated metal cladding panels or glazing	£2,850,000
Preliminaries @20%	£570,000
Contingency @20%	£570,000
Total	£3,990,000

The cost above is an indicative price for budgetary purposes based on a concept design. It includes materials and construction. A final cost would be ratified following detail design and tender.





Case Study 2

Provision of Improved Access and Interpretation Within Attenborough Nature Reserve

Attenborough Nature Reserve is one of the most important sites for wildlife in the East Midlands. The Nottinghamshire Wildlife Trust (NWT) have managed the site under licence from and in partnership with the owners, Cemex UK, since 1966. It was the first wildlife Trust reserve in Nottinghamshire.

The site extends to over 200 hectares of habitat and acts as a catalyst to connect people and wildlife. The Trust and its volunteers work to restore and create natural habitats and maintain access and facilities for the benefit of wildlife and visitors alike.

Due to the Trust's intervention, with the support of the public, the site was saved from being developed as a land fill for 'dump ash' from the local coal fired power station. This would have resulted in the loss of a significant resource to both nature and the community.

From its early days the site, closely situated to the city, has been popular for bird watching, fishing and walking with routes established around the lagoons and maintenance carried out by volunteer groups.

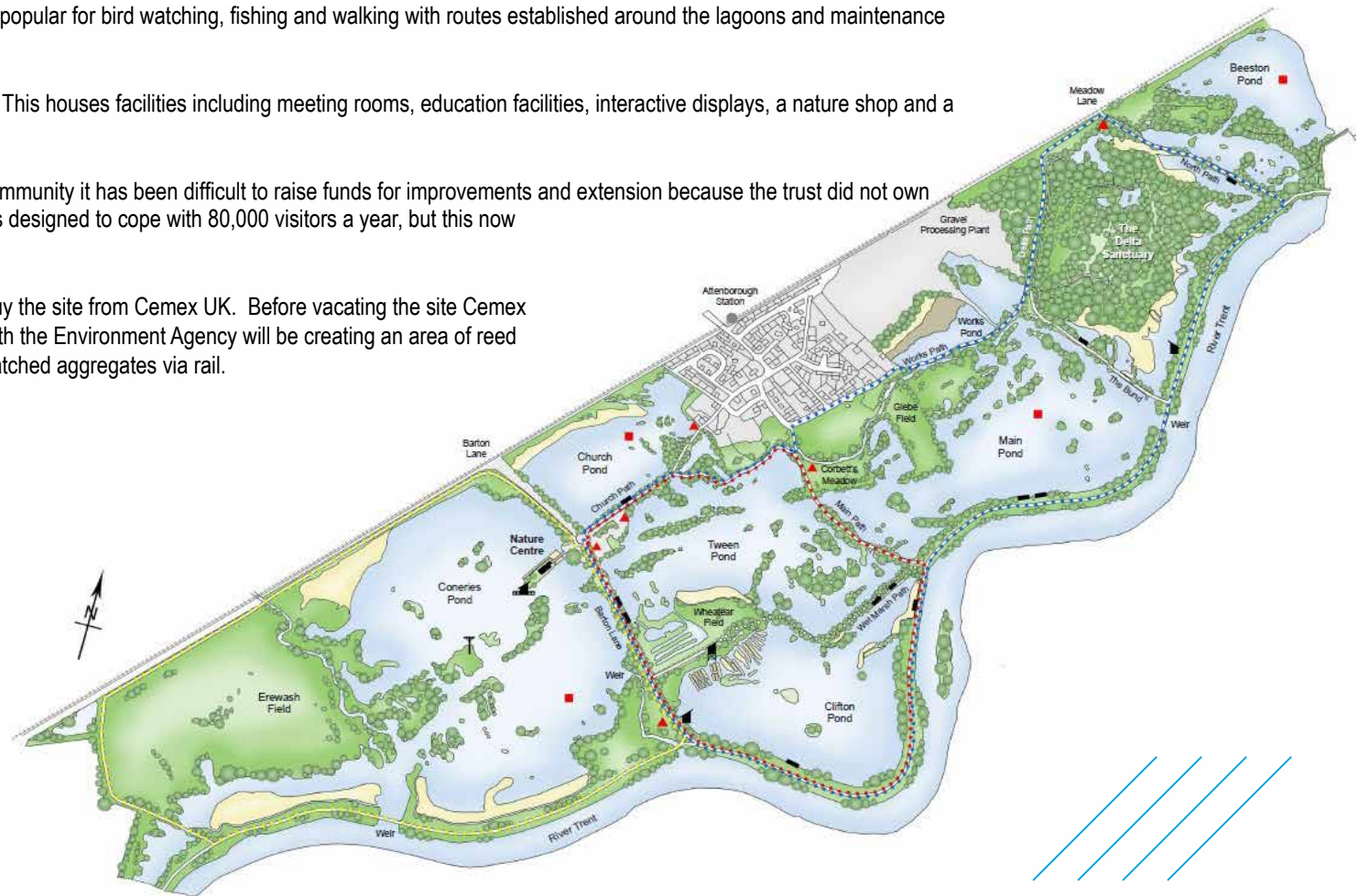
In 2005 the Attenborough Nature Centre was opened on the site. This houses facilities including meeting rooms, education facilities, interactive displays, a nature shop and a café.

Whilst recognised as an important resource for nature and the community it has been difficult to raise funds for improvements and extension because the trust did not own the site and could not guarantee its future. The visitor centre was designed to cope with 80,000 visitors a year, but this now exceeds 200,000.

Recently the NWT successfully ran a fund-raising campaign to buy the site from Cemex UK. Before vacating the site Cemex will be removing the remnants of its infrastructure and working with the Environment Agency will be creating an area of reed bed towards the northern end of the site where it previously dispatched aggregates via rail.

Now that the future of the site has been secured NWT can plan for the future and the improvements required to accommodate the increasing level of visitors as well as providing a better visitor experience. Improvements initially required are:

- Extend the visitor centre in its current location and develop the area around the visitor Centre access bridge to create an improved facility for visitors to sit, picnic, observe wildlife and for education/interpretation/information
- Extend the network of foot paths to the soon to be created reed bed area and improve surfacing of existing routes to provide more access to a wider visitor base.
- Provide signage and interpretation around the site to improve the legibility and information about the wildlife routes and trails.
- Creation of reed bed near the visitor centre





Concept design for picnic/education area





Final area of reinstatement to create new reed bed habitat

Proposed site for visitor centre overflow and outdoor education area

Existing visitor centre to be extended

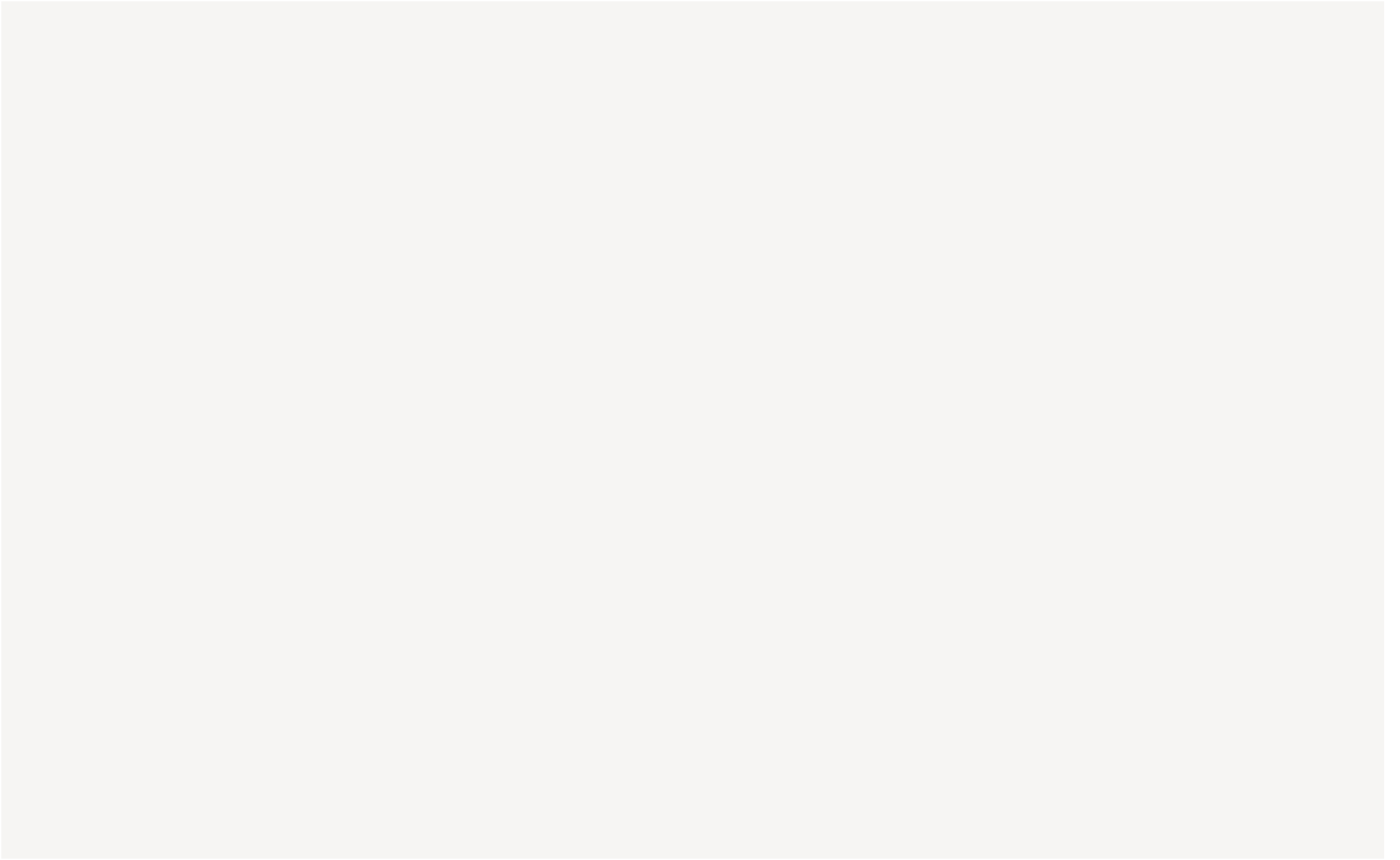
Proposed area for reed bed development adjacent to visitor centre

What might it cost?

Picnic/outdoor education area		Furniture		Rates for footpath and interpretation improvements	
Site clearance (2000m ²)	£4,000	Serpentine style benches (6m long) x 3	£9,000	Footpath - Self-binding gravel 2m wide timbre edge. (per 100m)	£9,400
Self-binding gravel arae (1200m ²)	£38,400	Timbre/steel benches (2m long) x 5	£7,500	Footpath - tarmac 2m wide narrow concrete kerb. (per 100m)	£13,600
Resin bound gravel area(600m ²)	£51,000	Picnic benches x 6	£18,000	Interpretation board (each)	£800
Paved path to Visitor centre (200m ²), Tegula style blocks, random size	£23,000	Interpretation/information display	£2,000	Basic wooden bench (each)	£450
Kerbs/edging (180m)	£6,300	Preliminaries @20%	£31,840		
		Contingency @20%	£31,840		
		Total	£221,760		

The cost above is an indicative price for budgetary purposes based on a concept design. It includes materials and construction. A final cost would be ratified following detail design and tender.





Case Study 3

Habitat Creation in the Flood Plain

The landscape structure within the flood plain affects:

- The visual appearance and how it is perceived by the local community and visitors
- The character of the area
- How the river is access and used
- The natural processes and ecology of the river
- The ability of the area to cope with flooding and drought
- The ability of the area to accommodate climate change
- The ability to provide sustainable drainage systems that can affect land downstream

The River Trent as it flows through the Trent Gateway has changed course and character over time due to natural processes but also due to human activity. The river and land has been adapted for transport, as a source of power, for farming, as a source of minerals and for recreation. Consequently much of the natural habitat has been lost due to engineered river banks, river course diversions, land clearance for farming, building development and construction of river defences to protect property.



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Example of wet woodland



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New Woodland Creation planted approximately 25 years ago on agricultural land

Across the Trent Gateway there are many opportunities to reinstate the habitats that have been lost and to enlarge and join up those areas that still exist.

The three principle habitat types that have been identified for attention are:

- Wetland comprising of open wetland features, grassland and/or woodland
- Woodland and hedgerows
- Grassland

The Trent Gateway masterplan identifies the key areas where habitat creation would be beneficial. Further opportunities and granularity can be found in the Nottinghamshire Biodiversity Action Plan.





© Copyright Jonathan Wilkins

Example of wet grassland

Much of the land identified is owned by private land owners. Their buy-in and co-operation will be key to the success of realising the vision and objectives of the Trent Gateway. Many landowners will already be carrying out environmental enhancement through stewardship schemes or similar initiatives. Through the Trent Gateway objectives the partnership will look to help join up existing initiatives and encourage more challenging targets so that the sum of the parts is greater than the whole. Additionally there may be opportunities for land to be purchased to create larger areas of habitat and carry out more dramatic interventions such as creation of wildlife sites which will provide resilience to ecological communities and increase biodiversity.

Opportunities will include:

- Large scale tree planting
- Reinstatement of hedgerows and use of hedgerows to connect areas of scrub and woodland
- Natural habitat features between flood protection structures and the river bank
- Reinstatement of vegetation along the river bank edge
- Creation of grass/vegetated margins on pastoral fields to reduce bank erosion and improve habitat connectivity
- Creation of grass/vegetated margins along hedgerows and boundaries on arable fields

Large Scale tree planting

Once large scale tree planting starts to mature it provides multiple benefits including:

- Natural habitat for wildlife
- Natural flood management (NFM) through storage of water on the flood plain which will benefit land and people further down stream.
- Carbon sequestration - The amount of carbon sequestered varies on the tree species, age and condition but one tree could sequester around just under 100ib (45Kg) over 50 years
- Production of sustainable building materials

The type of woodland created should be tailored to the specific site conditions. Where conditions permit the creation of wet woodland would be desirable as this type of woodland has greatly decreased in recent times and is considered a threatened habitat.

Reinstatement of hedgerows and use of hedgerows to connect areas of scrub and woodland

Where hedgerows have been removed or have become gapped over time, reinstatement can provide linear green infrastructure which will benefit insects, birds, and mammals providing them with nesting, feeding, resting, protection and commuting routes. Where hedgerows can link existing areas of vegetation such as scrub and woodland, the value becomes even greater. Generally completing/reinstating hedgerows will make little difference to the productivity of the land but will do much to increase the biodiversity and habitat value of the land.



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Example of native hedgerow



Natural habitat creation between flood protection structures and the river bank

Construction of flood protection features along the River Trent have done much to protect property and people. However in some cases the structures have left areas of field isolated and largely unusable or inefficient for farming. Many of these areas would be suitable for creation of wetland features such as scrapes, backwater and woodland.

Backwaters provide a valuable habitat for fish during their development by creating low flow areas required by small fish and fry for resting away from the main flow of the river.



© Copyright Shaun Ferguson
Backwater of the River Great Ouse

Wet by-pass channels can be created which can be permanently connected to the river channel or restricted to when water is at higher levels. These channels can enable a diversity of habitat to develop.

Reinstatement of vegetation along the river bank

Long stretches of the river have little or no vegetation associated with the river bank. Areas of the bank need to be kept clear for maintenance purposes however the lack of vegetation can result in gradual erosion of the bank. Planting along the bank can provide stabilisation in addition to enhancing the ecological habitat. Overhanging vegetation provides protection and shade for fish. Additionally in areas of intense farming a vegetated strip along the river can reduce nitrate runoff from the fields.

Creation of grass/vegetated margins on pastoral fields to reduce bank erosion and improve habitat connectivity

In addition to vegetating the river bank the vegetation of a 30m strip of land can greatly increase habitat provision and connectivity, particularly when it connects hedgerows or areas of woodland. Vegetation can be wild flowers, scrub planting, tree planting or a combination. The root systems will act to retain the river bank and reduce nitrate run off.

Creation of grass/vegetated margins along hedgerows and boundaries in arable fields

A 6m wide margin along hedgerows and field boundaries can greatly increase the biodiversity of the hedgerow by allowing a rich under storey to develop which in turn will encourage a wider range of insects and birds to colonise the hedge. The margin provides a buffer to protect the hedge from the application of herbicides and pesticides.



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Wild flowers in the field margin of an arable field

Grassland creation

Much of the rural land within the Trent Gateway is species poor pasture or agricultural field. Opportunities throughout the area are present to create new species rich grasslands and meadows which are nationally considered to be habitats under threat and therefore a priority.

In addition to the ecological and general environmental benefits, the enhancement and creation of Blue-Green infrastructure on the flood plains will also create new vistas in the landscape, potentially enhancing the value of the area, drawing in visitors from the wider area and contributing to the area's economy.





Example of lack of vegetation along river bank leading to gradual erosion of the bank



Example of pasture extending to waters edge - potential nitrates run-off into watercourse with limited biodiversity and habitat



Example of historic hedgerow gapped over time that would benefit from gapping up to increase connectivity and biodiversity



Long extents of engineerd river bank - low biodiversity and diminished habitat





Remnant field isolated by flood defence



Long extents of engineerd river bank - low biodiversity and diminished habitat

What might it cost?

Indicative rates for large scale environmental enhancement

Mixed native hedgerow planting (Double row, guards, planted) per 100m	£580	Standard Native tree planting (10-12cm girth, 300-350cm, single stake) each	
		Quercus robur (Oak)	£105
Native woodland planting (2m centres, guards, planted) per Ha	£12,810	Betula pendula (Birch)	£100
		Prunus avium (Cherry)	£100
Wild flower meadow seeding (Cultivation and seeding) per Ha	£50	River backwater creation (assumes 50m channel, 5m wide, 1.5m deep arising retained on site)	£18,375

These costs are provided as an indicative price for budgetary purposes and would vary according to quantity, ground conditions, planting specification and access.

The costs do not include:

- Design
- Survey and archaeological investigations
- Planning consent
- Professional fees
- Maintenance





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