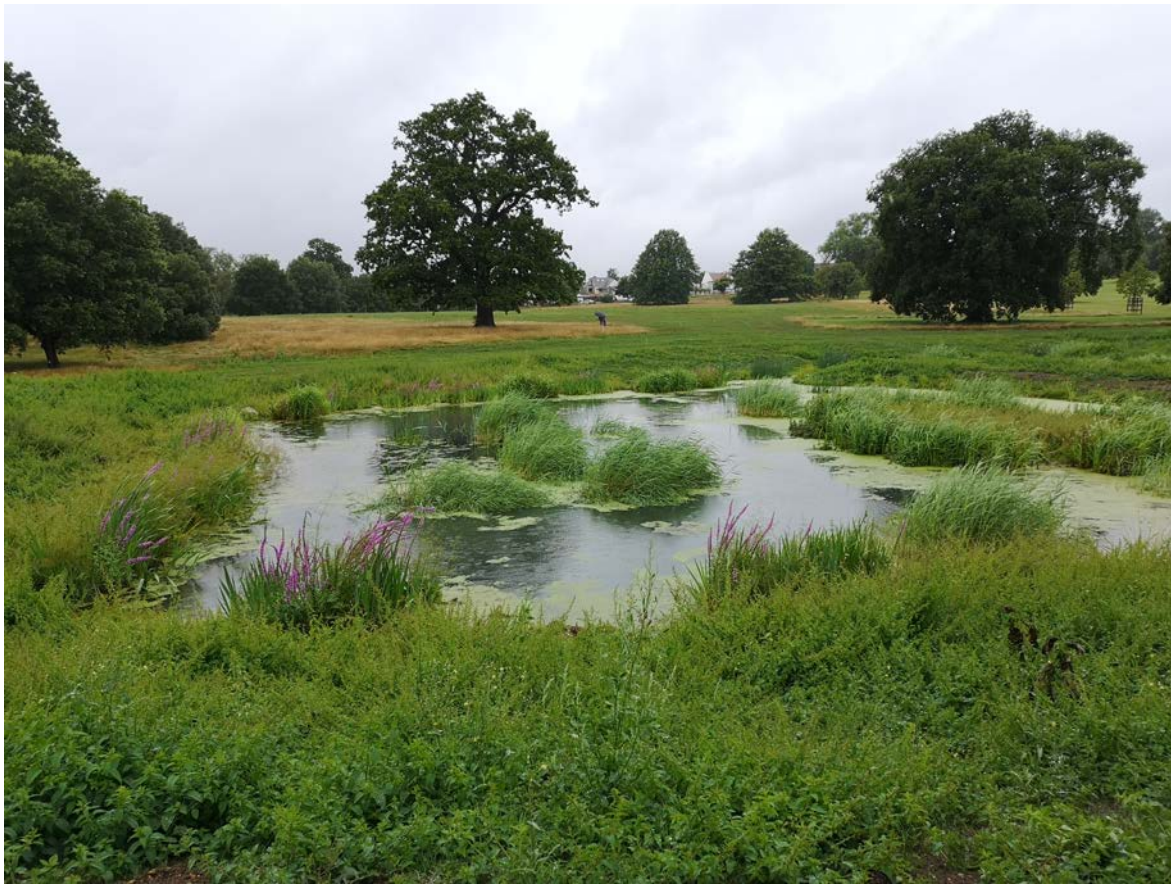
Broomfield Park Wetlands



SuDS used

- *Constructed Wetlands*

Benefits

- *Flood alleviation*
- *Improving water quality*
- *Improved amenity space and natural world and educational resource*

- *Biodiversity and variety of natural habitats*
- *Spaces for community involvement*

1. Location

Broomfield Park, **Palmers Green**, Aldermans Hill, N13. London Borough of Enfield

2. Description

The surface water drainage system was diverted to a newly **constructed wetland** within a well-used park to fit into the **existing parkland setting**. The introduction of a wetland altered the way that **surface water flows** through the park, ultimately attenuating high flows. The existing surface water sewer running through the park drained an urban area of approximately 40 hectares. The wetland captures surface water from this area and **removes pollutants** before discharging to Pymmes Brook, a tributary of the Lower Lea, which is one of the most polluted catchments in the UK.

3. Main SuDS components used

Existing surface water sewer diverted to a **constructed wetland**

4. How it works

An existing surface water sewer which running directly through through the park was diverted by modifying the pipe at a certain point, sending dry weather flows (and storm flows up to a certain volume) to a newly constructed wetland.

The wetland was sited at a strategic point in the lower corner of a park in order to intercept other land drainage networks as well as the main surface water drainage run.

The wetland was excavated below existing ground levels to a maximum depth of 2m in order to accept flows from the surface water sewer. The desgin of the wetland was carried out with consideration of the existing space, which included a water main and a number of mature and semi-mature trees. There was space for 2 main cells with banks of varying gradients (no steeper than 1/3), the arrangement of the cells maximises the length over which the flows travel. The wetland is planted with a mixture of reeds and marginal plug plants.

At the outfall the water is returned to the surface water sewer via newly constructed connection. The sewer connects to a main river – Pymmes Brook some 250m away. The wetland has capacity to store flood flows due to a bund at at the downstream boundary and an overflow mechanism.

The wetland cells are linked by a wetland channel and variations in invert level were made to include deeper pools and islands in order to provide a range of water depths and habitats.

5. Specific project details

The project was delivered by Enfield Council with the support of Thames21 and Rivers Trust. The project was carried out using funding from the '**replenish programme**' which is a global fund from Coca-Cola Foundation and WWF which aims to work locally to contribute to returning equivalent

amounts of water used in drinks and their production back to **communities and nature**. The wetland was delivered with the full support of the parks Friends Group, with planting events attended by them, the general public and donor organisations staff.

Initial public consultation for the project in the park revealed that there were on-going concerns about the water quality and high silt content of the existing cascade of 3 lakes in the park. Subsequent investigation revealed that the lakes had been isolated from the surface water sewer at some unknown point in the past. Therefore the design was amended to re-route flows directly to the lakes and incorporate wetland style reed planting in the upstream forebays of each lake outfall. This SuDS style solution was implemented in advance of the later wetlands. Due to the diversion of the surface water sewer into the lakes the re-design connected the flows from the lakes, rather than directly from the surface water sewer, into the newly constructed wetland (the sewer remained in place to accommodate exceedance events). Therefore the flow regime for the whole park was altered in order to improve the water quality in general as well as improving the appearance of the lakes and ultimately the level of treatment delivered as a whole. Another incidental benefit of this approach was the fact that it kept flows higher in the system and reduced the overall excavation required in the wetlands. This solution demonstrated the importance of a genuine consultation with the public, park users and Friends Groups.

The planting of the wetlands was carried out over 2 volunteering planting days, organised by Thames21 and involved volunteers from the community and Coca-Cola.

6. Maintenance & operation

The project has altered the flow regime through the park, culminating in the the water flow previosuly confined to a surface water sewer running through the park discharging into a newly constructed wetland. The new pipework diverted to the wetlands include manhole access chambers at strategic places. The inlet and outfalls are located in proximty to paths with gradients which can accomoate clearance by a maintenance vehicle if required.

If necessary in the future an upstream manhole can be manually modified (by removal of a bung), which would allow the wetland to dry out if any assessment of widespread silt is required.

Ultimately one of the functions of a feature such as this is to capture silts before they enter the main river channel and pose a wider flood risk.

A specific wetland management plan has been compiled along the lines of others in the borough and include the periodic clearance of inlets and outfalls and seasonal thinning of reeds and vegetation.

A high level of invovlement from a parks Friends groups ensure that any urgent maintenance issues can be identified. From this autumn it is also envisaged that students from a local agricultural college will arrange volunteer maintenance days.

7. Monitoring and evaluation

A programme of upstream and downstream evaluation of water quality has been carried out led by the project partner Thames21. The final results of this analysis are still pending. The scheme aims to replenish up to 200,000 m³ a year. A model study showed that ammonia removal by the wetland should be substantial.

8. Benefits and achievements

The main objectives of the project were to tackle three important local water challenges in the catchment of the River Lea: firstly to improve **water quality** in the Pymmes Brook, a tributary of the River Lea that has been subject to a high level of urban pollution. Secondly to improve local **biodiversity** through creating new wetland habitat and thirdly storing **flood water** to protect downstream properties from flooding. When considered in combination these benefits make this project fit for a future adapted to climate change.

The wetland provides a new space and land type for the community to enjoy in an already well used and regarded park. Local school children are encouraged to engage with nature and use the wetlands as a living classroom, so they can learn about wildlife, climate change and other environmental issues.

Long-term, the new wetland now provides a rich biodiversity of plant, insect and bird life for the local community to enjoy, enhancing health and well-being.

Correspondence and social media from the Friends of Park group and members of the local community illustrate the positive impact of the wetland, including an example from a local schoolteacher who organises visits for school children to the new wetland to learn about its environmental value.

A local lady has also written a short song about the benefits of the wetland: https://www.facebook.com/groups/48597291524/permalink/10156467559236525/

A local artist has also used the wetlands for inspiration.

9. Lessons learnt

Securing planning permission was a very lengthy process and took longer than originally expected, with some heritage focussed stakeholders concerned that the new wetlands would affect the heritage value of the Registered Park and Garden. It is therefore important to consider the sometimes conflicting views which can be upheld when a project like this is moving through the planning phase. Despite the proposals being designed as closely in accordance with a published Conversation Management Plan for the park endorsed by the Heritage groups as possible, there were points of contention.

In addition to securing planning permission, it was critically important that the wetland project secured the active support of the local community. To achieve this, Thames21 and Enfield Council ran a programme of engagement, explaining the design, creation phase, and benefits of the wetland to the local community through a series of events. As a result, the Friends of Broomfield Park group were very supportive of the wetland and took an active role in volunteering for the 'planting up' events and are keen to help maintain the wetlands in future. This engagement was also key to

helping the local community understand how such wetland features can help bring a range of environmental benefits across the wider locality.

10. Interaction with local authority

The project was Local Authority led and devised and managed by the Lead Local Flood Authority team in accordance with objectives from a published Local Flood Risk Management Strategy for the Borough. Despite this prior to planning the project required several levels of approval including with Parks and the Cabinet Member for Environment.

Once designed the project was then also judged to be subject to planning permission. Therefore there was on-going interaction with the Local Planning Authority. Being an internally applied project, it was also subject to planning committee.

11. Project details

Construction completed: *2019*

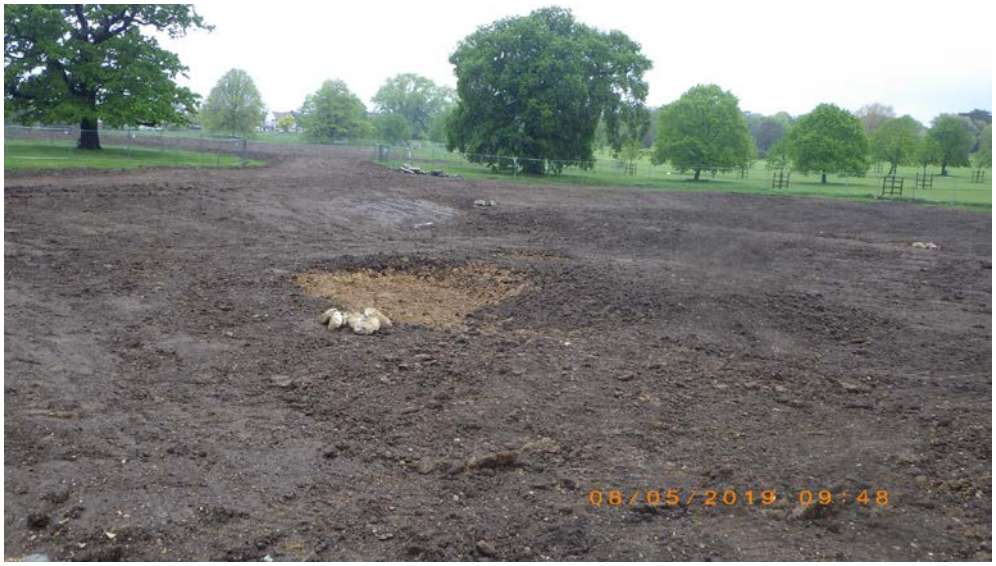
Cost: *£150,000*

Extent: 1300m^2 of wetland cells

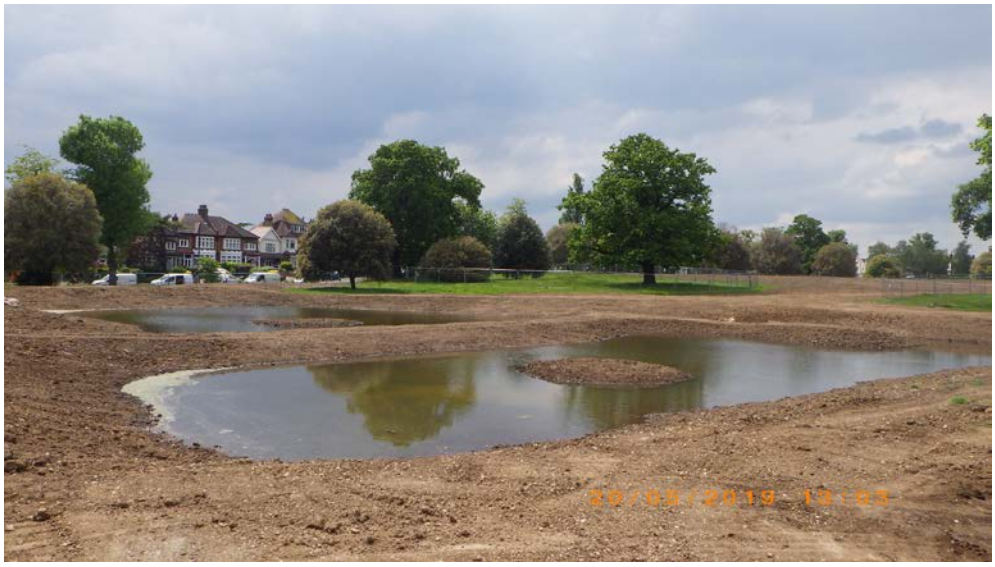
12. Project team

Funders	• Coca Cola Foundation • London Borough of Enfield	
Clients	• London Borough of Enfield • The Rivers Trust	
Designers	• London Borough of Enfield •	
Contractors	• Miles Water Engineering • Enfield Archaeological Society	
Other	• Thames 21 • WWF • Friends of Broomfield Park • Pymmes Brookers	

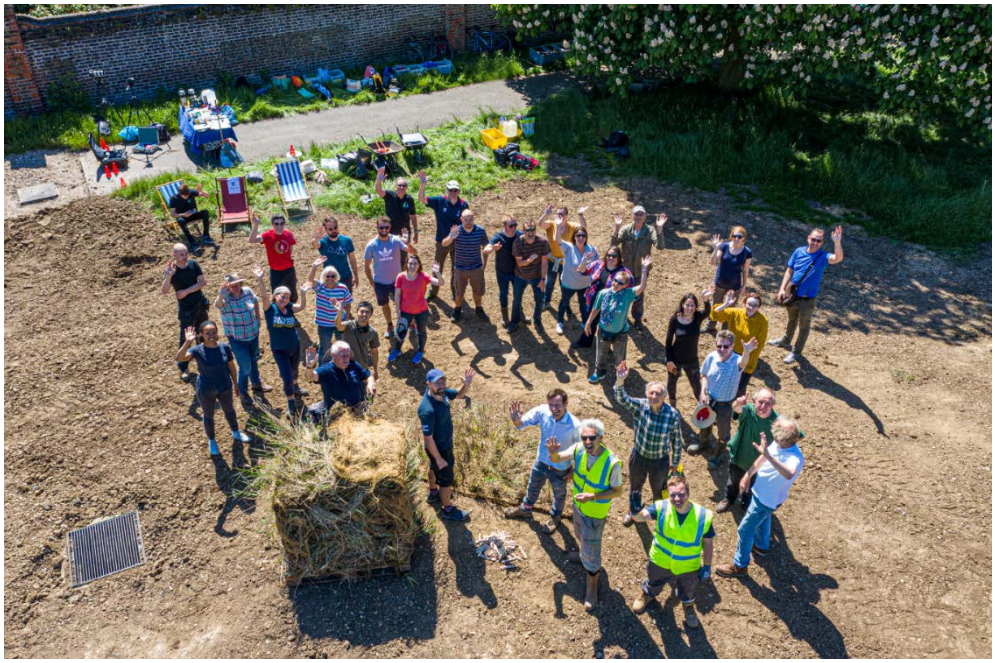
Initial excavation of clay (late March 2019)



Final shaping of wetland cells with topsoil including formation of bund, deep pools and islands (early May 2019)



First connection of water into the wetlands (late May 2019



Volunteer planting event (late May 2019)

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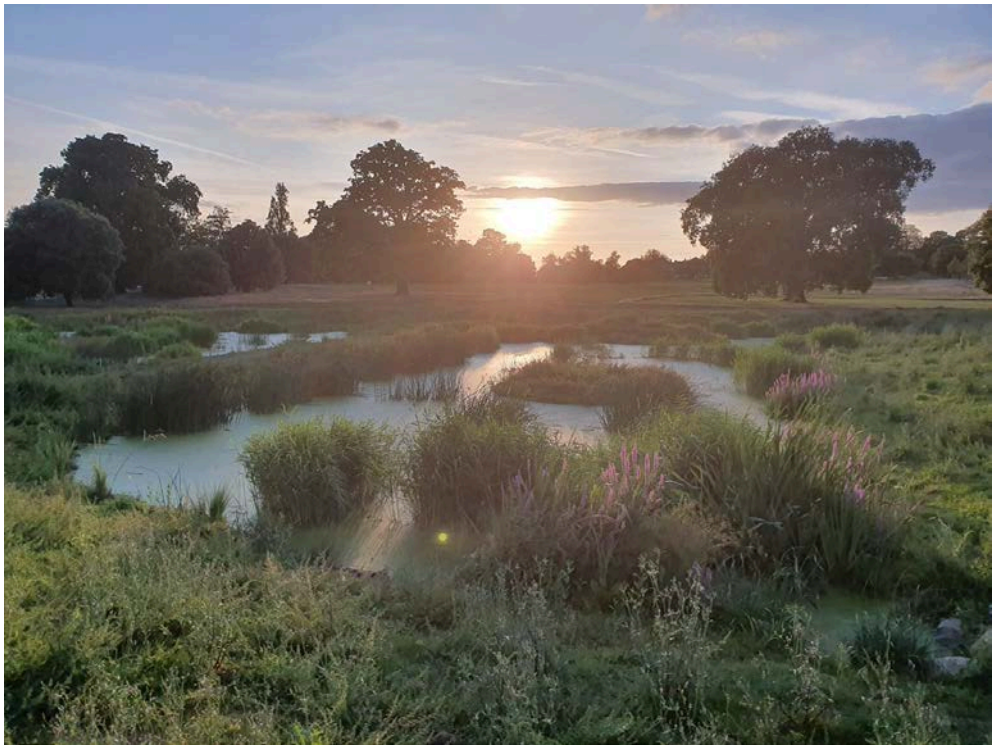
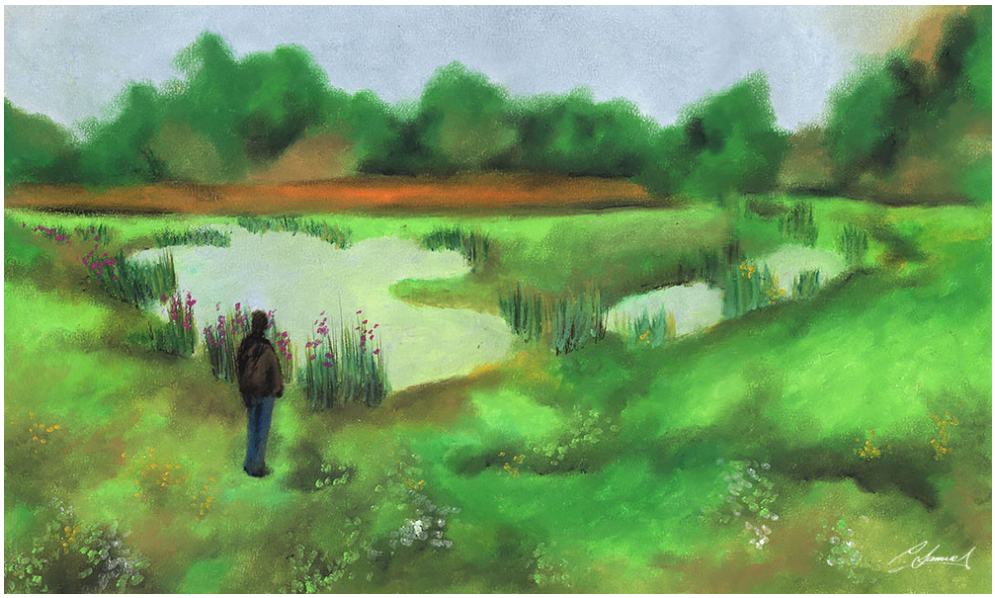
Stepping stones through wetland channel



End of the first summer at the wetlands (September 2019)



"A place for my thoughts" by Patrick Samuel (Local artist)