

Designing SuDs to Deliver BNG

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Introduction to Hull



A city built around water

~300,000 population

>90% below high tide level

20% England's land drains via estuary

84% surface water drains to sewers

100% reliant on pumping



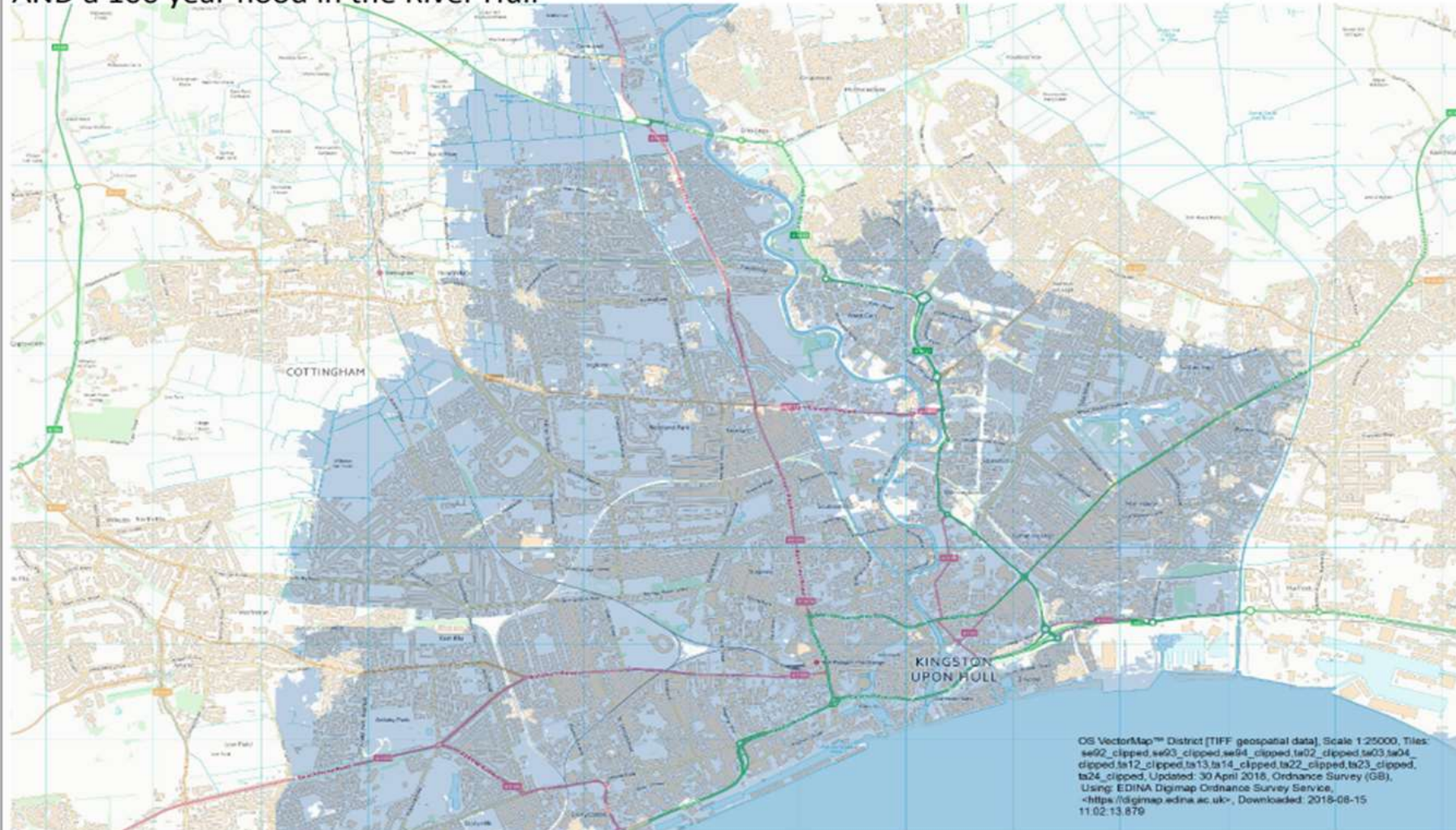


- First occupation of Wyke on Hull in 1193
- Formal name of Kingstown-Upon-Hull given in 1299
- Evidence of settlements in elevated locations before this
- Drainage occurred in mainly in 1700 and 1800s to allow farming of land and development

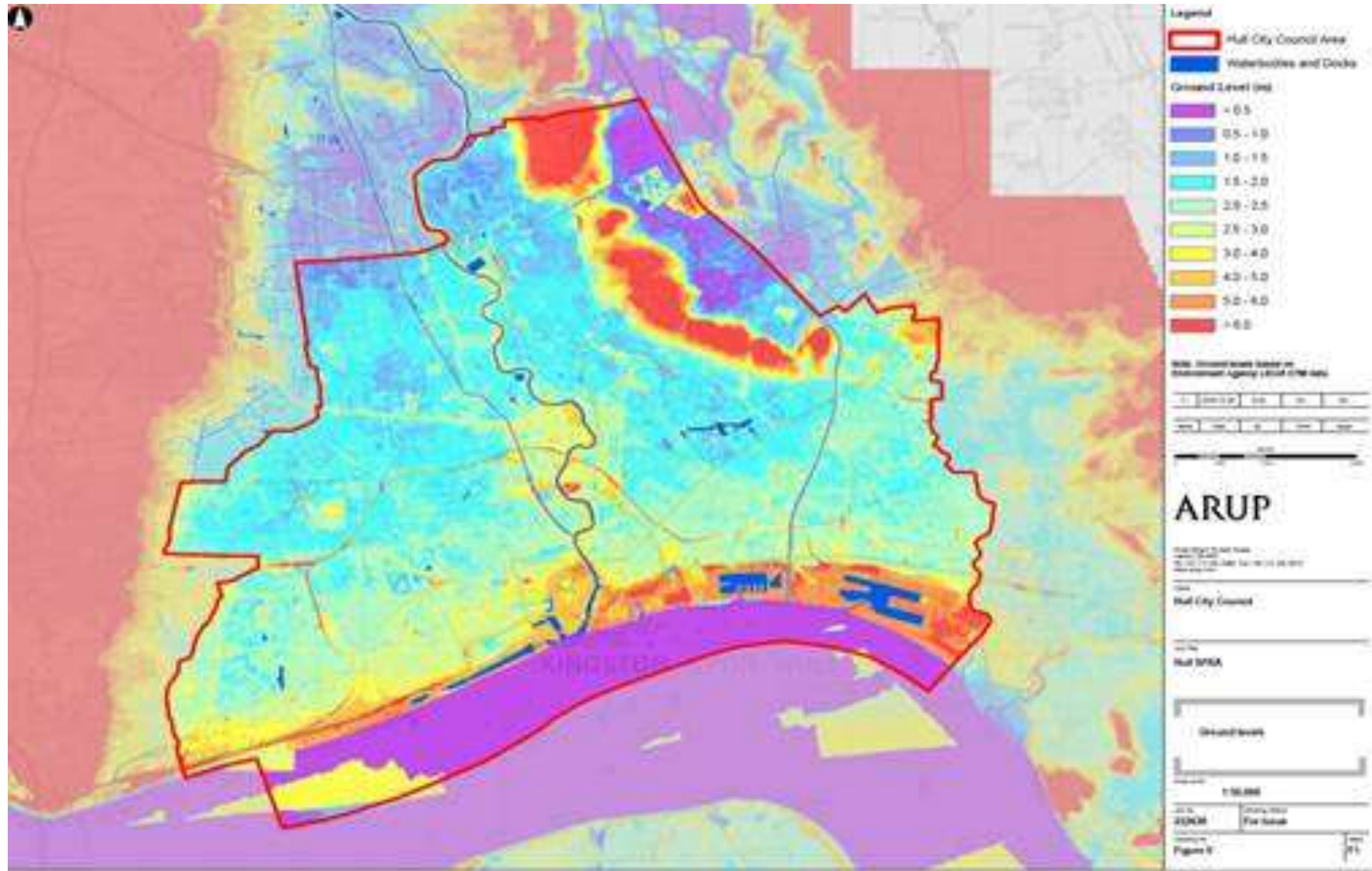
The issue



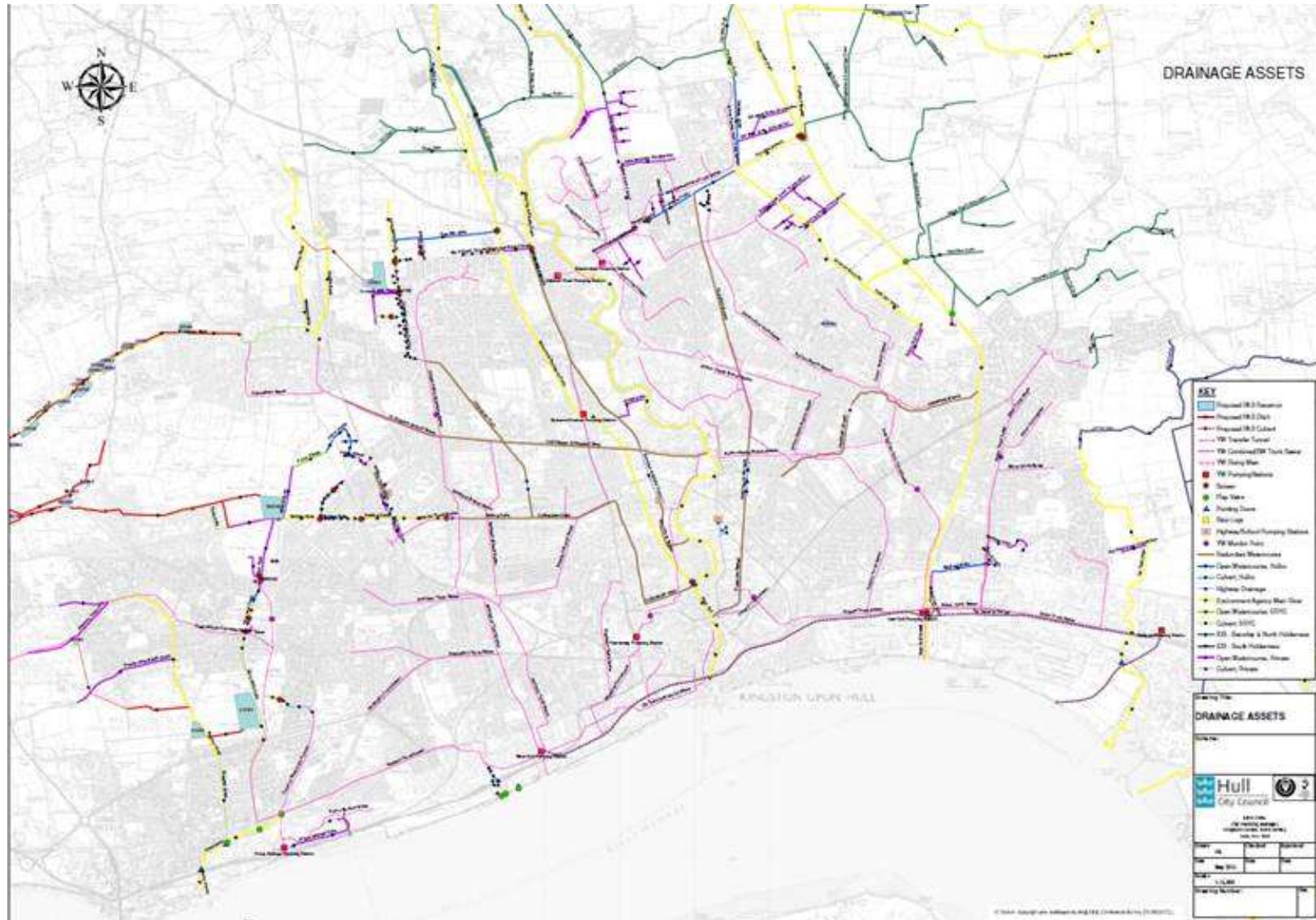
Scenario : December 5th 2013 storm surge with Hull Tidal Barrier not operational, plus 1m sea level rise AND a 100 year flood in the River Hull

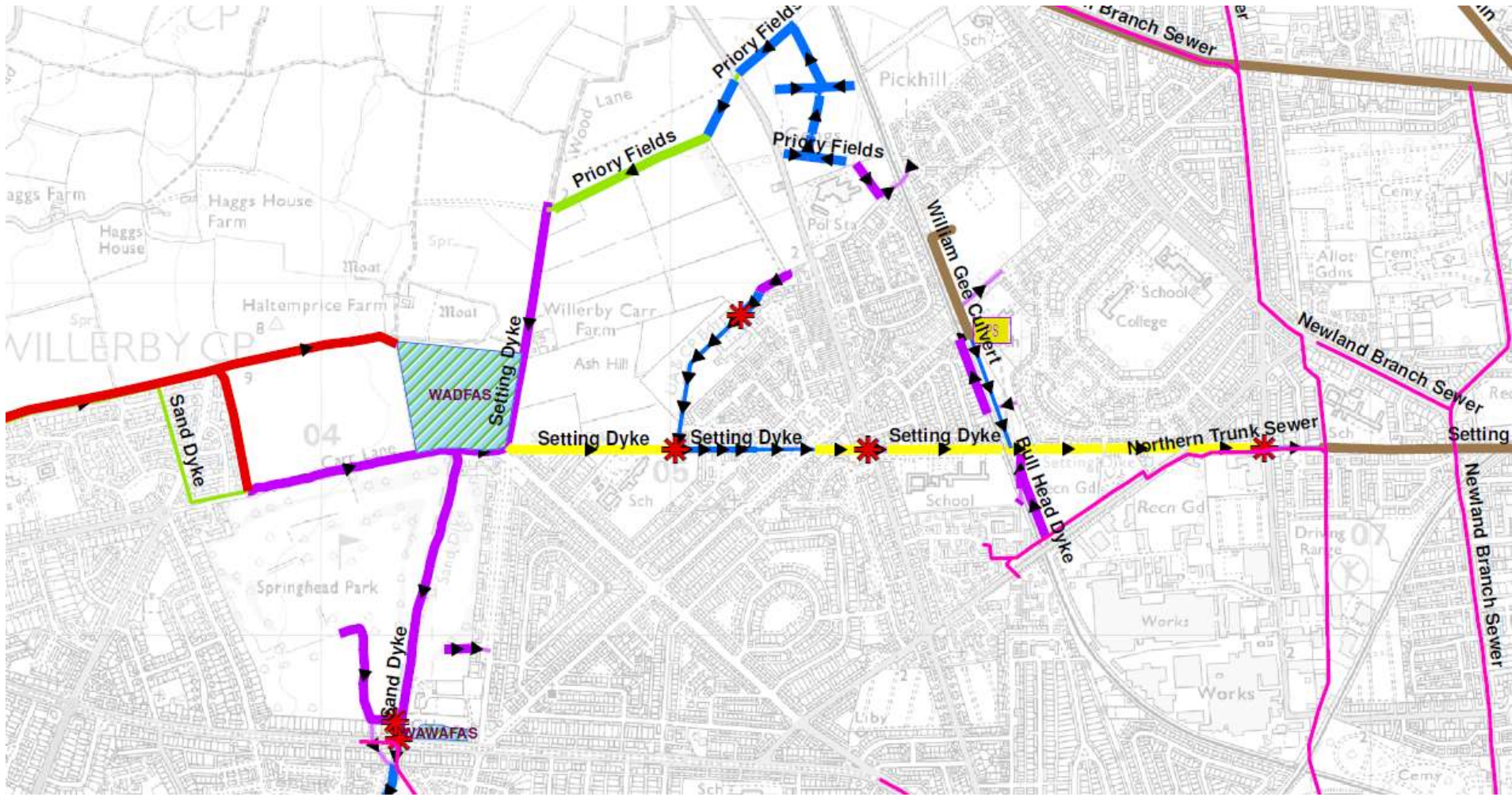


Land levels



Drainage Plan





Cottingham Drain 1880's



Cottingham Drain 1940's and 1960's



LWW Partnership

Reduce
Flood Risk



Build
Community
Resilience



Share
Knowledge



Improve
Place



Enhance
Economy



Blue Green Plan has a layered strategy



The plan can be delivered in a phased approach.



Blue green corridors, aquagreens, pumps, source control, and smart systems manage surface water and reduce flood risk.



With community support, buildings, roads, and green spaces manage water at the source and slow the flow.



Natural Environment Investment Readiness Fund – BNG and SuDs



- Living with Water recognised the opportunities to align the delivery of BNG with the Blue Green Plan and retrofitting SuDs/Urban NFM.
- Relevant for new development SuDs and retrofits
- Applied for NEIRF to pilot this approach
- AtkinsRéalis took this work forward

BNG – An Introduction

- *Development that leaves biodiversity in a better state than before*
- **Measurable using habitat as a proxy and a metric to calculate net losses/gains**
- Mandatory for T&C Planning Act projects in England from January 2024
- In England, net gain system runs alongside existing policy/legal protection of sites, habitats and species



Mechanisms for BNG Delivery

Onsite (units)

Potentially in full or combination



Delivered on-site via habitat creation/enhancement via soft estate/green infrastructure/landscaping

Offsite (units)



Delivered through new habitat creation/enhancement on landholdings or via habitat banks. May involve legal agreements with public/ private landowners directly or via broker

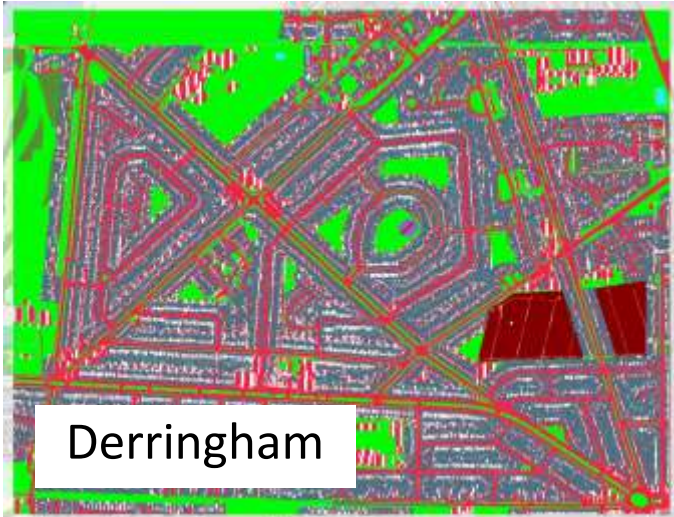
Statutory Credits (2024 onwards)

Only if units not available



Paid into central government managed system to support landscape-scale strategic habitat creation

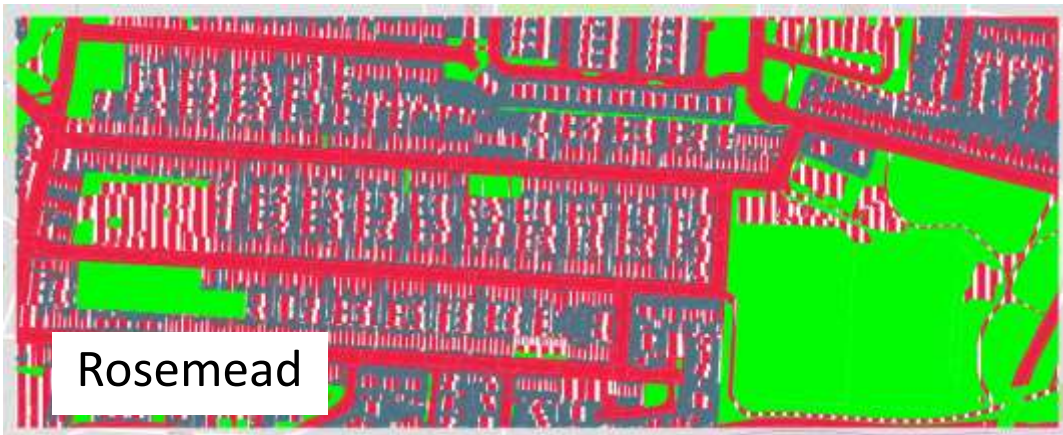
Proposed SuDS schemes – BNG baseline



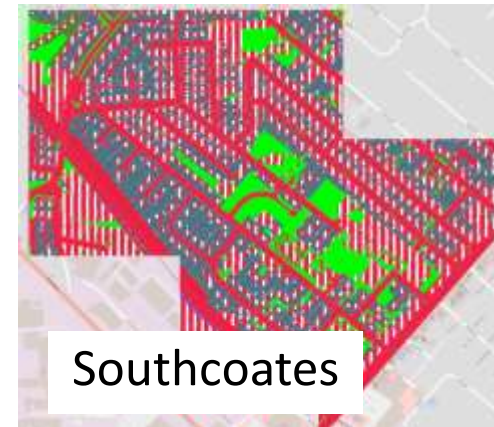
Derringham



Bilton



Rosemead



Southcoates

- Desk-based assessment
- 4x schemes in Hull
- Largely urban habitats
- Low baseline biodiversity value

Proposed SuDS schemes – Standard SuDS Designs

- Interventions that have not been designed with biodiversity in mind
- Typically of low biodiversity value
- No significant net gain or even a net loss

Aquagreens – Detention basins – Raised planters - Swales – Rain gardens – Tree pits



Proposed SuDS schemes – Biodiversity Enhanced Designs

- Designed with biodiversity in mind
- **Example** – targeting species-rich grasslands
- **Example** – using only native species
- Overall net gain can be achieved



BNG/SuDS Toolkit

Biodiversity Net Gain and Sustainable Drainage Systems Toolkit

This is a high-level prospectus/catalogue that identifies the BNG benefits of different SuDS assets and how to maximise them. It is a practical guidance document that is aimed at users with an existing level of understanding of the concepts. It does not include detailed explanations of concepts or illustrative design examples.



Top Tips for SuDS/BNG Delivery

When looking for **locations to develop** SuDS, target areas that support existing **habitats of very low distinctiveness** (e.g. hardstanding areas). If not possible, target areas that support **low distinctiveness habitats** (e.g. modified grassland).

Potential presence of other **ecological constraints** will need to be considered e.g. **protected species**

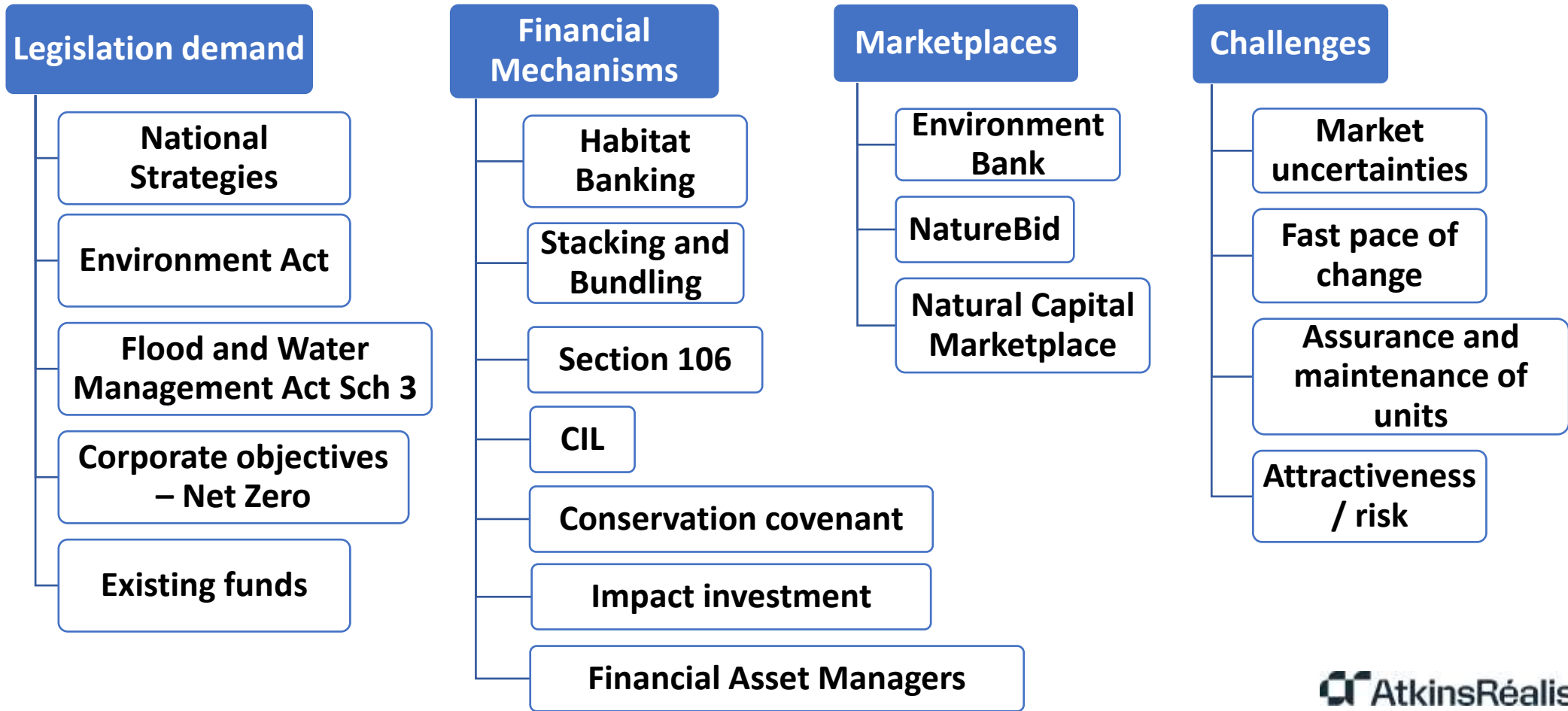
Semi-natural habitats should be **retained as a priority** and enhanced

Gains do not have to be restricted to the SuDS themselves, potential to **enhance retained habitats** around proposed SuDS intervention areas.

Delivering fundable and revenue generating SuDS and Biodiversity Net Gain



Literature Review



Delivering fundable and revenue generating SuDS and Biodiversity Net Gain

Key findings



Using early adoption case studies, and government impact assessment assumptions, this commission estimates the demand for biodiversity units as a result of **BNG legislation may generate upwards of £400,000 per annum** from developers unable to deliver BNG on-site.

The **Habitat Bank** could be utilised in the scenario where i) capital funding for the SuDS has already been sourced (as with the SuDS programme) to fund maintenance and future capital expenditure, or ii) where capital funding is required (as with the Blue Green Plan).

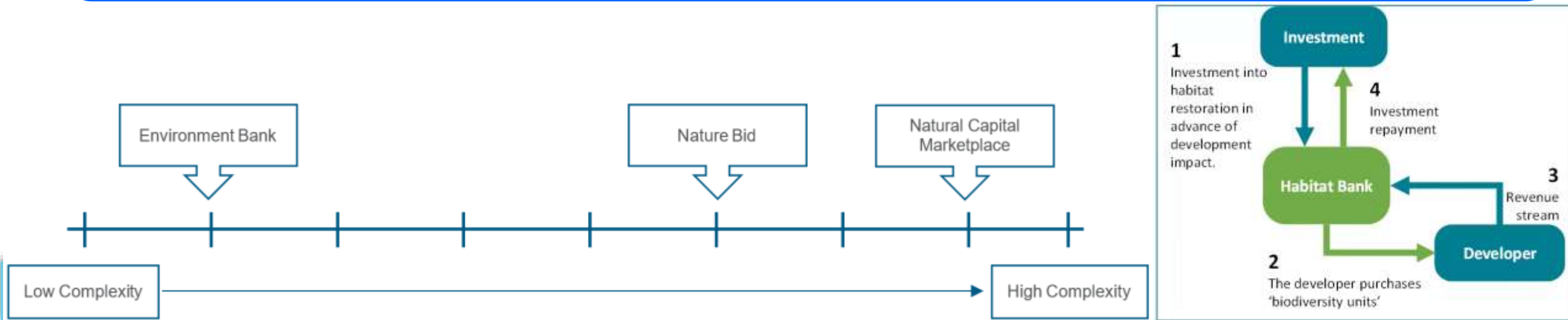
The future incorporation of **benefit 'stacking'** into the habitat bank, would **allow for multiple benefits to be realised**, valued, and ultimately sold to increase the potential financial benefits from each individual SuDS.

Delivering fundable and revenue generating SuDS and Biodiversity Net Gain

Key findings

Habitat Banks: the creation and sale of biodiversity units through habitat banks needs to cover maintenance and monitoring costs to ensure the estimated BNG is realised. This may include the costs training of existing staff, or contracting with external partners.

Uncertainty in the biodiversity marketplace: There are variable projections and real-life case studies on future biodiversity unit demand and supply, creating significant uncertainty in the marketplace. This will impact upon the future price of biodiversity units, and LWWP’s final strategy on whether funding will be sourced prior to or post construction of the SuDS and/or other assets.





Delivering fundable and revenue generating SuDS and Biodiversity Net Gain

Next steps

- Significant benefit in evaluating the **local demand for biodiversity credits**.
- Explore initial **creation of an urban habitat bank** to fund the existing short term maintenance requirement of SuDS where capital cost is already funded.
- Continue integrating and **collaborating with existing funding initiatives** not linked directly to biodiversity credits.
- Longer term, early **engagement with large scale nature-positive investors / asset managers** should occur, to explore capital funding for the Blue-Green plan.

Key takeaways

SuDS can be used to deliver BNG in urban areas, if designed with biodiversity in mind with the following points being key:

- **Collaboration** – between SuDS specialists/engineers, landscape architects and ecologists
- **Site selection** – ideally baseline habitats being of very low (if not low) distinctiveness
- **Feasibility** – there are multiple factors to consider when determining the feasibility and probable success of SuDS interventions and associated habitat creation/enhancement
- **Long-term management** – this should be secured for at least 30 years