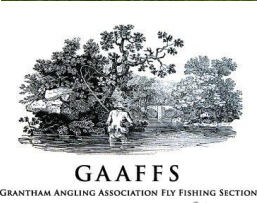




# Upper Witham Restoration



National  
Trust



Environment  
Agency



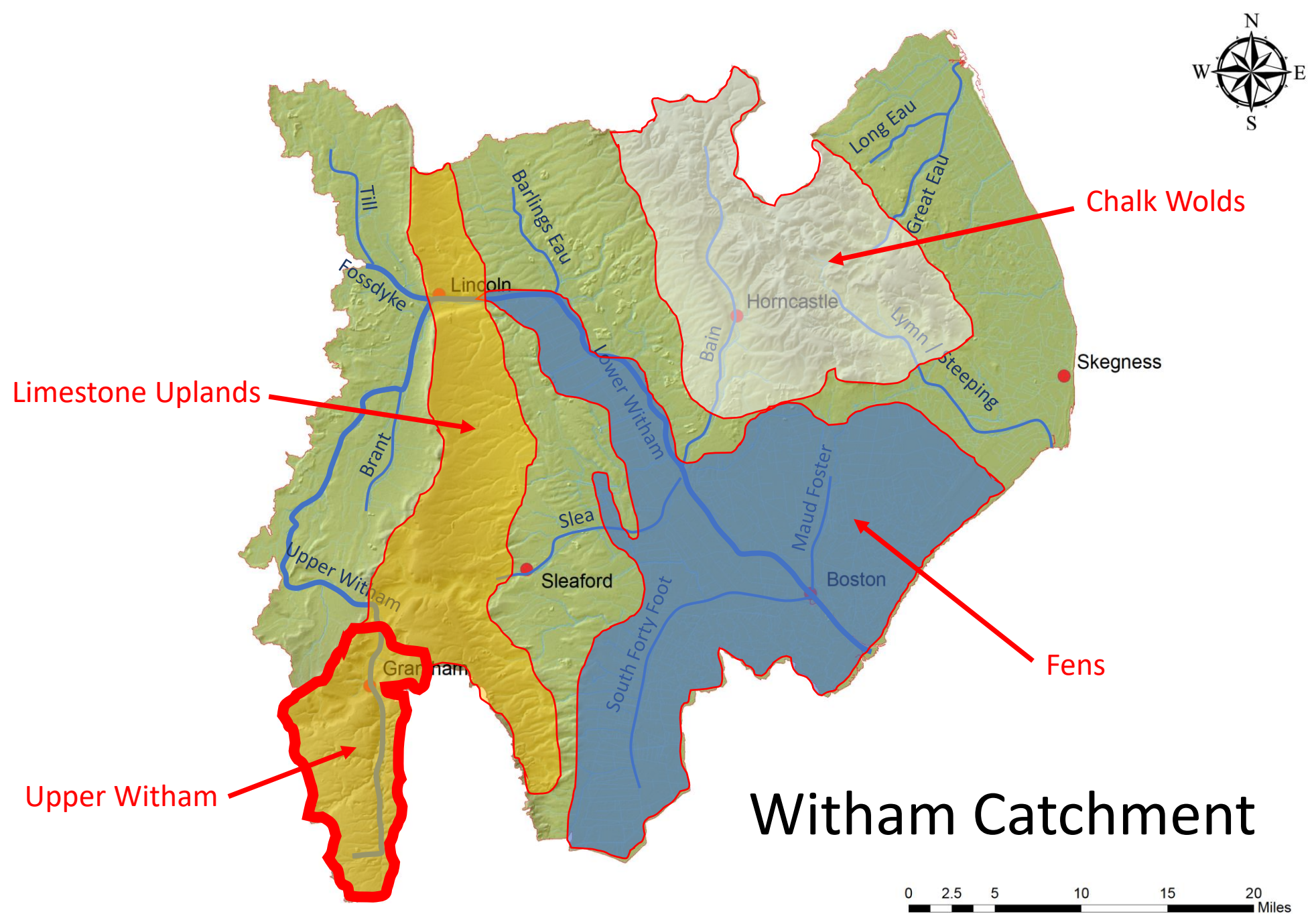
WILD TROUT  
TRUST

David Hutchinson – Environment Agency



# Where are we?











# Typical Upper Witham Catchments



Dry Floodplain

River channel pushed  
to side of valley

Deep uniform channel

Little gravel or wood





Trees in the floodplain

Well-connected floodplain

Gravel Riffles for trout spawning

Deep pools and tree roots

Back Water





# Early Restoration attempts.







A project part funded by the European Regional Development Fund in partnership with  
South Kesteven District Council, North Kesteven District Council, National Trust, Environment Agency



**European Union**  
European Regional  
Development Fund



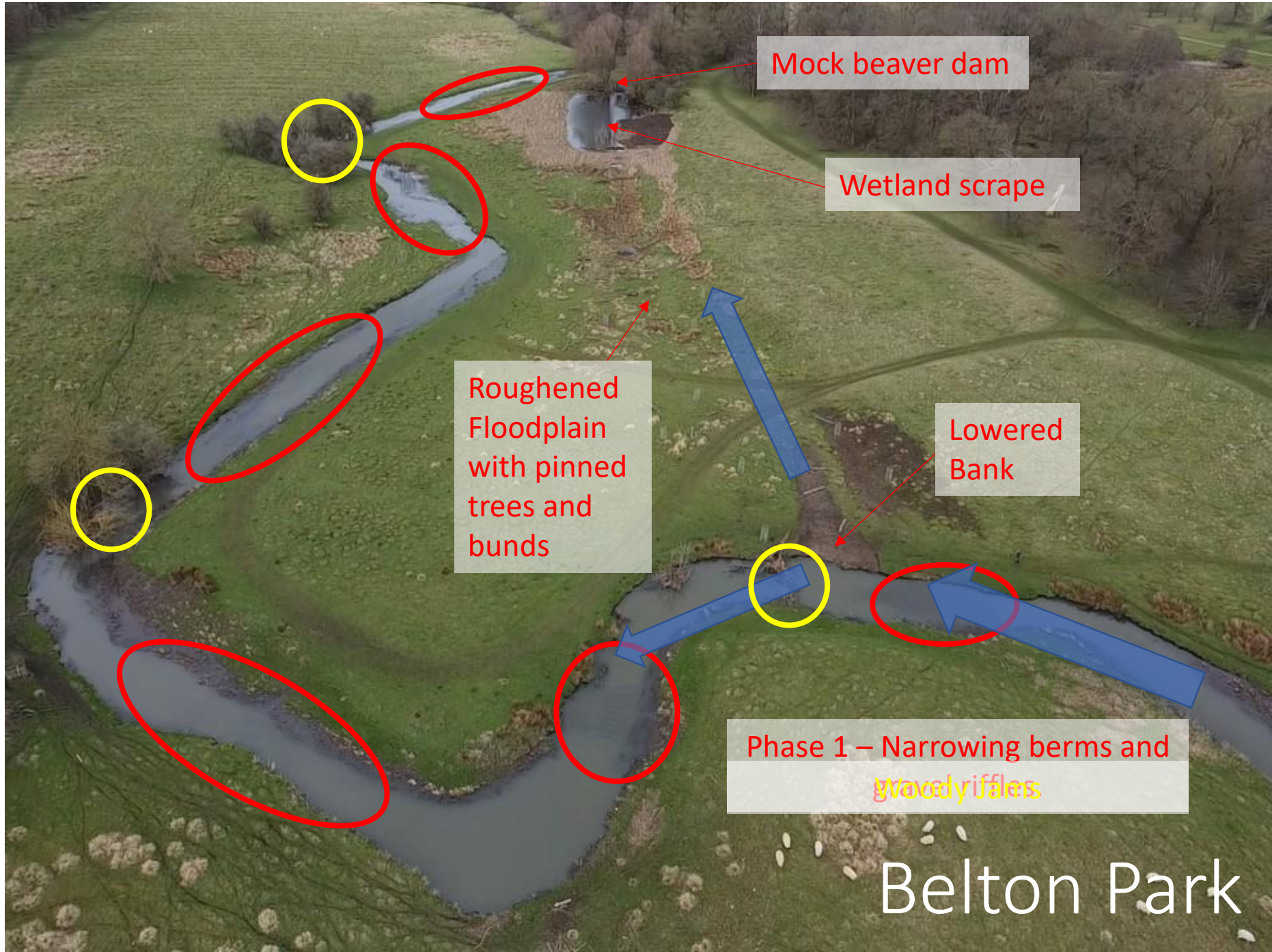
**SOUTH  
KESTEVEN  
DISTRICT  
COUNCIL**



**Environment  
Agency**

# Belton Park









Belton Park





# Manthorpe – Flood bank Removal

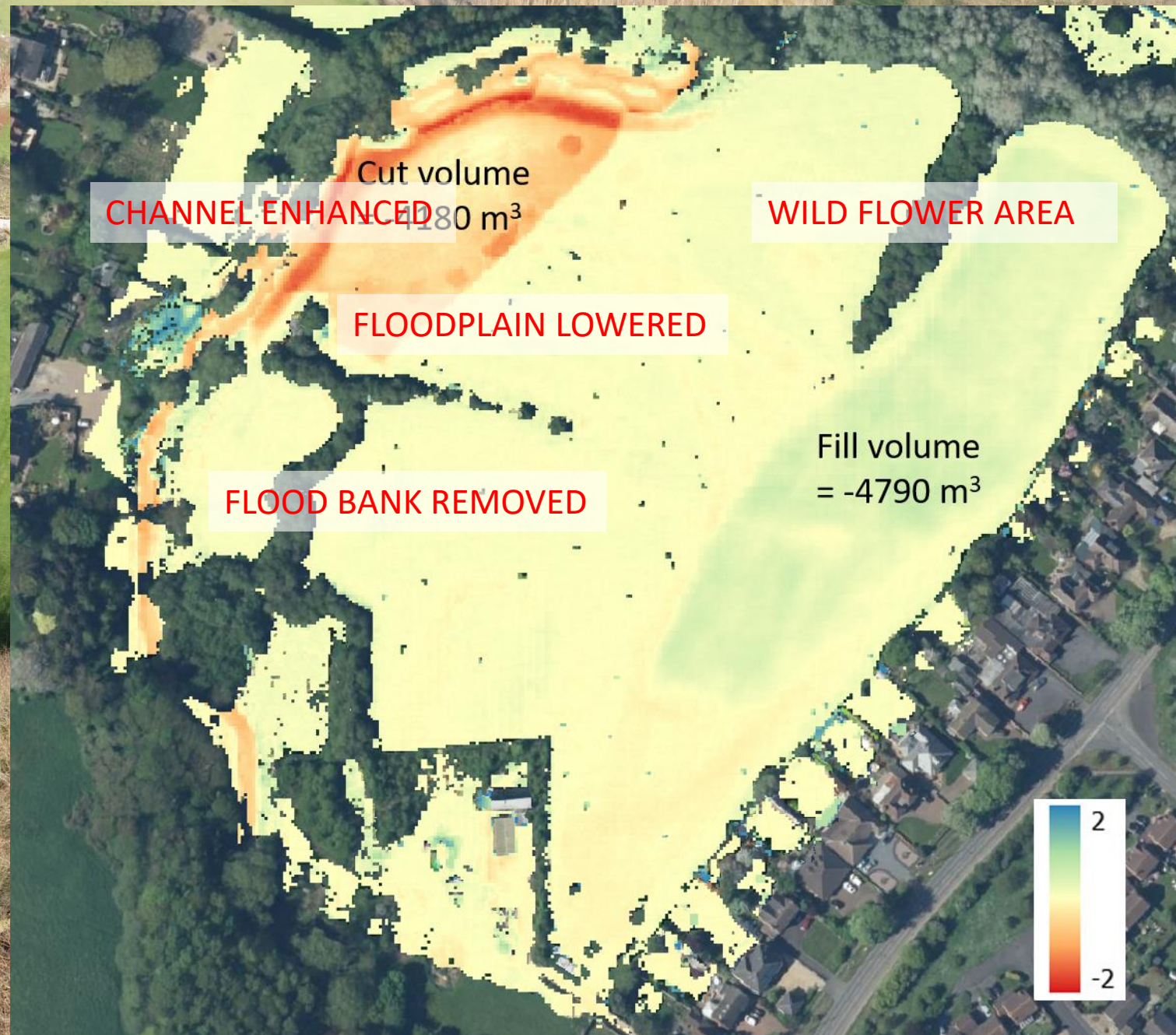
STRAIGHT DEEP, RIVER CHANNEL

FLOOD BANK

LOW WET FIELDS DISCONNECTED  
FROM RIVER



# Manthorpe





# Manthorpe - Channel





# Manthorpe - Floodplain





# Upper Cringle Brook







Upper Cringle Brook





Upper Cringle Brook





Colsterworth





Groundwater  
Fed Wetland

River  
widened

Gravel Bars  
and riffles

Wildflower  
area

Floodplain  
ponds

Colsterworth

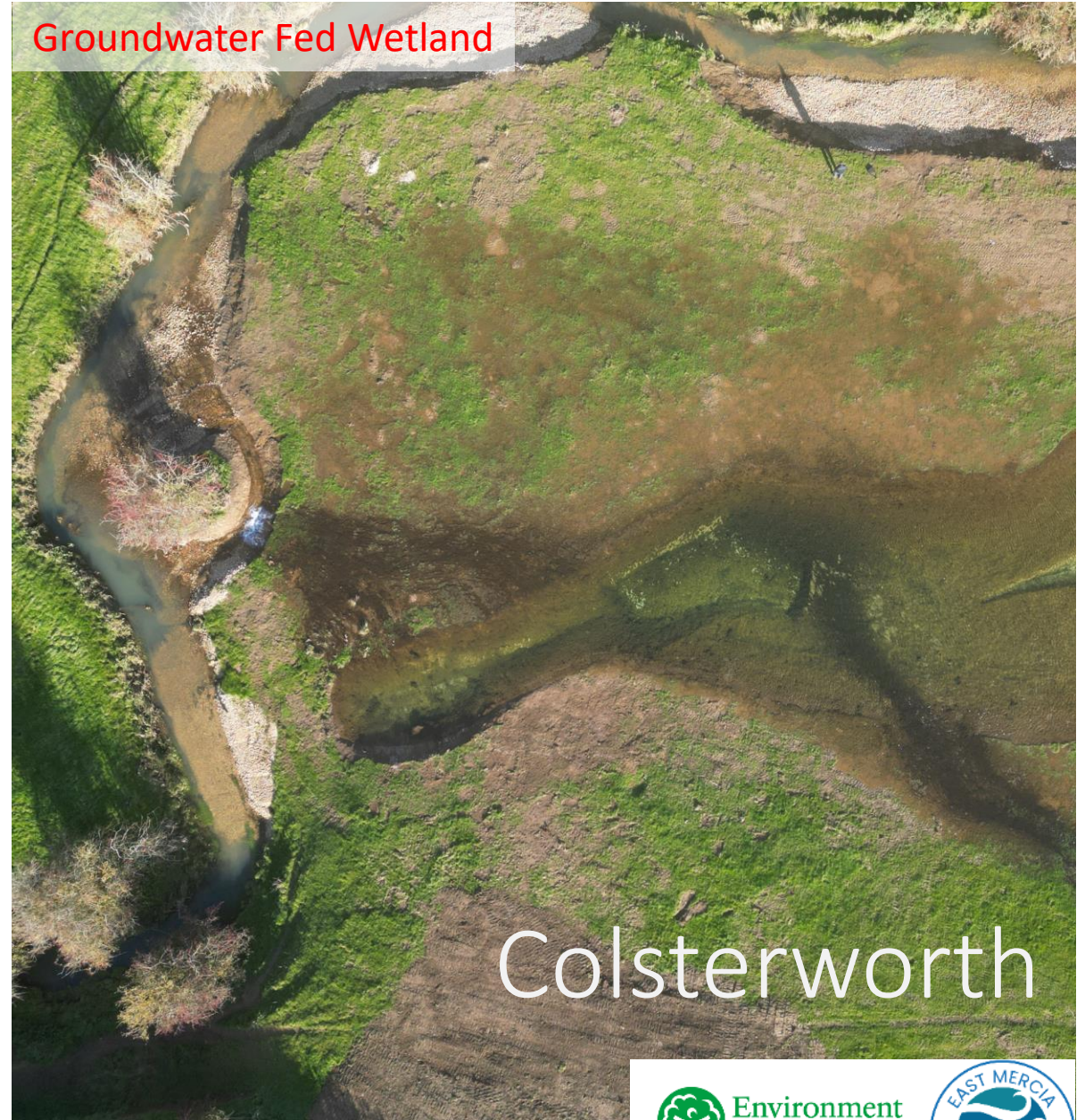




Natural Limestone Gravel



Groundwater Fed Wetland



In-set Floodplain



Colsterworth



# Grange Farm - Stage Zero

River Witham Pre Project

Dry Floodplain



# Grange Farm - Stage Zero

Old Witham Channel being filled

Roughened Floodplain





# Grange Farm - Stage Zero





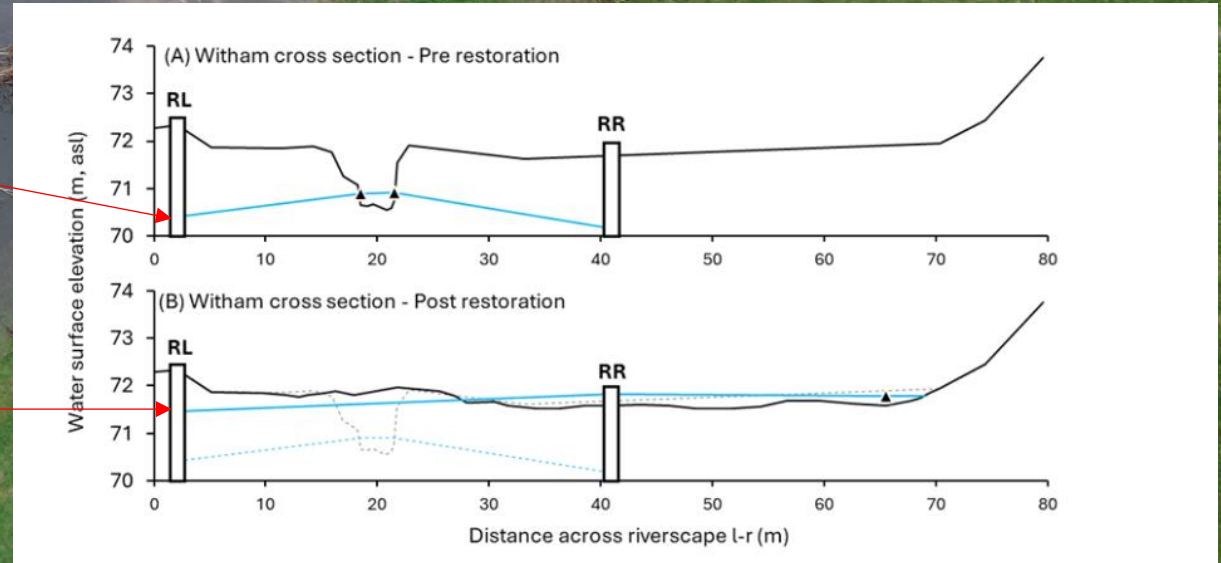
# Grange Farm - Stage Zero

River Witham Pre Project

Downstream end of project

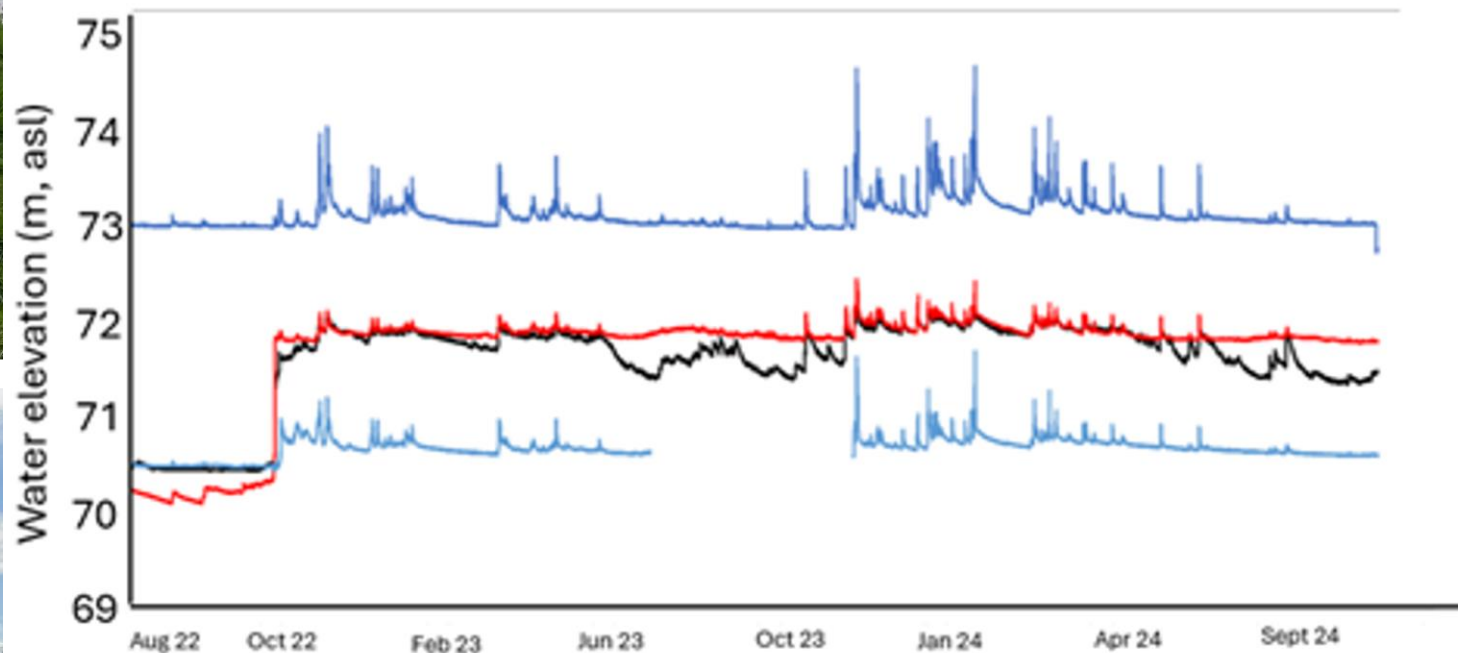
Pre-restoration Ground Water Levels

Post-restoration Ground Water Levels

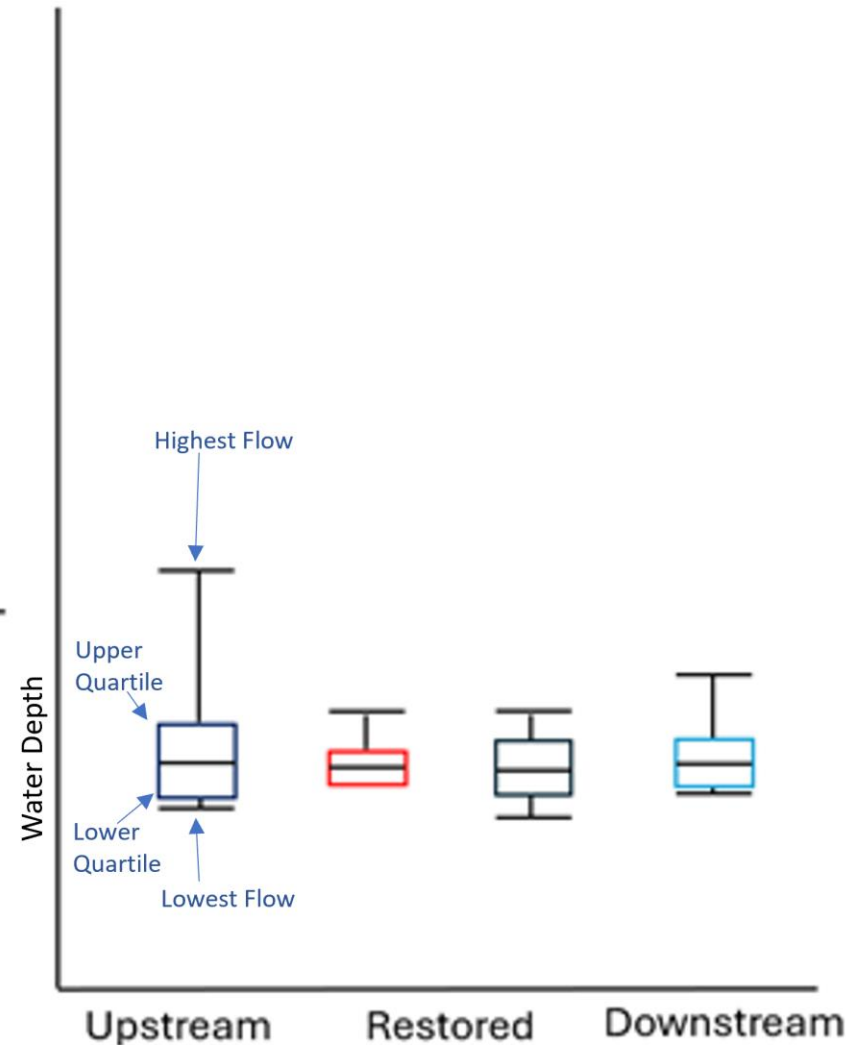




# Hydrological Changes



- Rapid rise in water level across site
- Water table held at floodplain surface for subsequent 2 years
- Evidence of attenuation of high flows and buffering of low flows
- Evidence that impacts propagate downstream



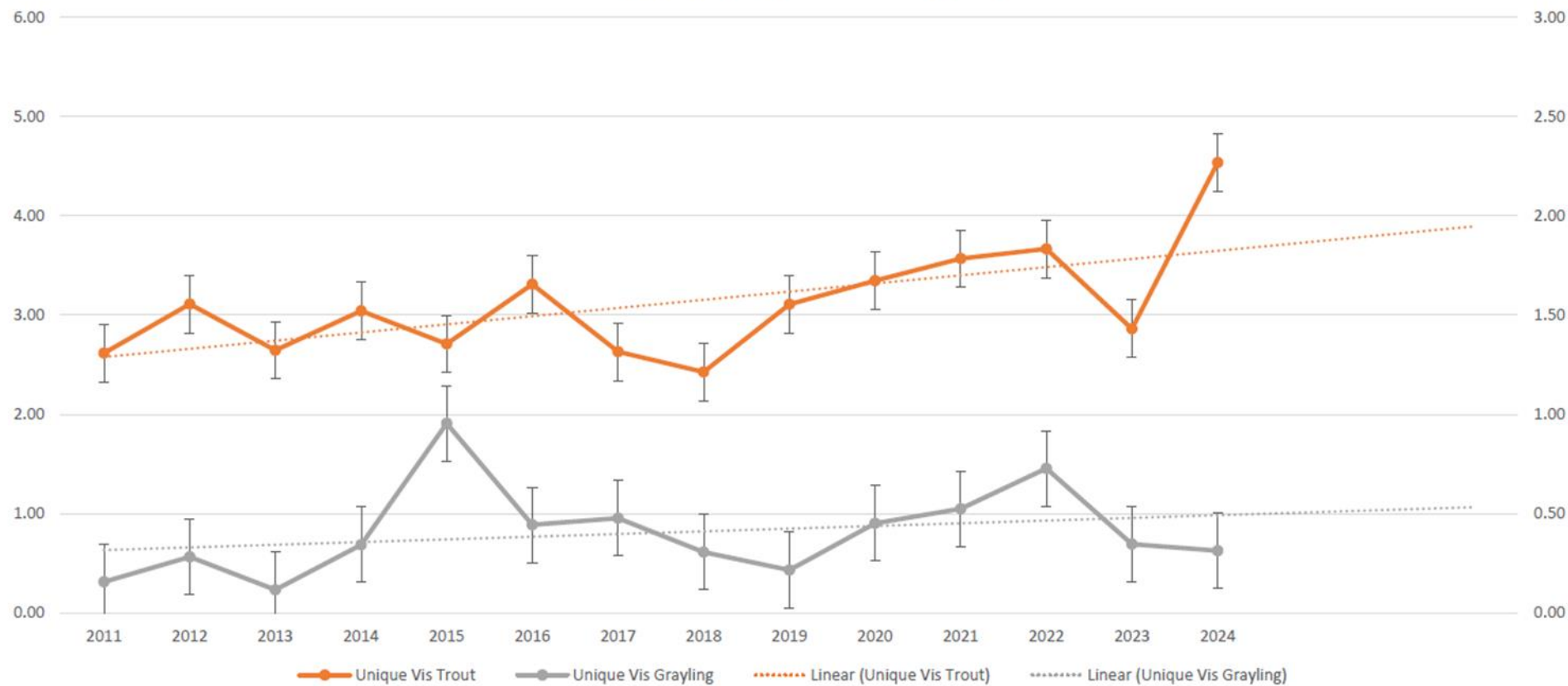


Added and secured wood



# TROUT AND GRAYLING TRENDS - RECENT

Averages by 'Unique Visits' - Since 2011



Current approach






Urban habitat improvement - Grantham



**THE GRANTHAM URBAN RIVER AND WETLANDS PLAN: An overview of issues and opportunities in the River Witham corridor**

[illegible][illegible]

**HOW TO EXPLORE THIS MAP**  
This map is a legend, not a map. To see the map, click on the "Map" button (1) located at the top of the Atlanta-Fulton County Stadium website. The map is a top-down view of the stadium and its surroundings, including the Atlanta-Fulton County Stadium and the Atlanta-Fulton County Stadium.

The map shows the city of Istanbul, Turkey, with the city's coastline and major roads. The study area is located in the city center, near the Hagia Sophia and the Blue Mosque. The map includes a legend and a scale bar.

**THE 1000th ANNIVERSARY OF THE BIRTH OF THE GREAT TEACHER**

The 1000th anniversary of the birth of the Great Teacher is celebrated in many ways. In China, the anniversary is marked by a series of events, including a large-scale performance in Beijing. The performance is a tribute to the Great Teacher's teachings and his impact on the world. It features a large cast of actors and a spectacular set design. The performance is a masterpiece of Chinese art, and it is a testament to the Great Teacher's enduring legacy.

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[illegible]

**Figure 1: A 3D visualization of a complex, elongated, and highly branched structure, likely representing a biological or geological formation. The structure is rendered in a translucent, multi-colored mesh (purple, blue, green, yellow, orange, red) against a black background. The structure is oriented vertically and shows a dense network of interconnected elements. The top part of the structure is more complex and branched, while the bottom part is more elongated and cylindrical. The overall shape suggests a highly convoluted and interconnected system.**

**LEGEND**

- Proposed New Container Terminal
- Existing Container Terminal
- Harbor
- Land
- Water
- Highway
- Railroad
- Freight Yard
- Industrial Area
- Residential Area
- Public Area
- Unimproved Land

**Figure 1** Map of the study area showing the location of the study area in the north-east of the city of Tehran, Iran.

[illegible]

Map of the Grand Canyon Urban River Plan showing the Colorado River and surrounding areas. The map includes a north arrow, a scale bar (0 to 1 mile), and a legend. The legend identifies symbols for the Colorado River, Grand Canyon National Park, and various land use designations. A table on the right lists the land use designations and their corresponding colors.

Land Use Designation	Color
Colorado River	Blue
Grand Canyon National Park	Green
Other Land Use Designations	Various colors (Yellow, Orange, Red, Purple, etc.)

                                                                    
--

forms/wetland habitat  
proved conveyance.  
require periodic  
sider crown lifting  
t levels to  
nd reduce erosion.  
ve been excavated in  
sediment to the  
in key locations.

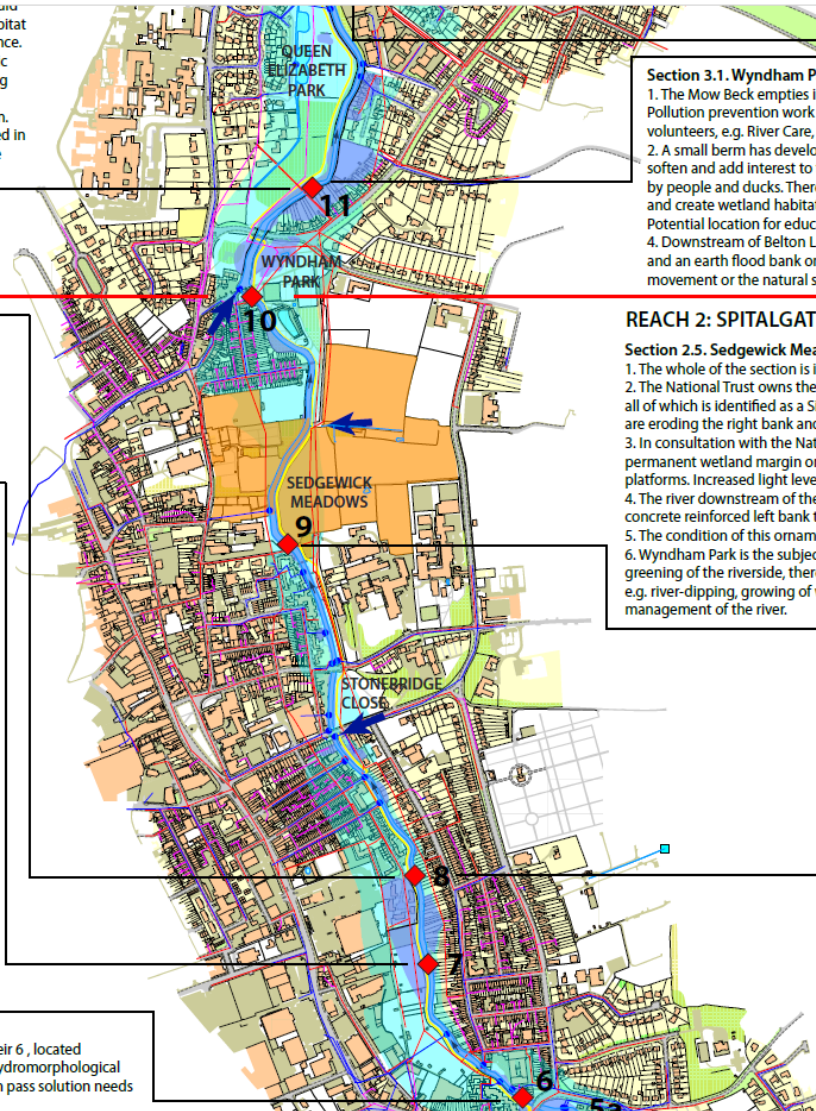
by hard  
g on the right bank  
length of overgrown  
cent to the riverside  
unds the river, limiting  
venting fish passage.  
Section 2.1 (above)

by hard revetment/walls  
ink and steep earth banks  
on the left bank adjacent  
ement revetment is  
iverside path. Use soft  
nd pinning riverside  
planted coir rolls, to  
reate marginal habitat.  
to green the vertical right

platform) have been  
ct water for irrigation.  
ter supply is now  
ne channel may be

the section and limiting  
n, but there are some  
h could be augmented  
uding the possibility of  
orphology and river

to Weir 6  
ol is impounded by the Weir 6, located  
d Rd. The weir is limiting hydromorphological  
on to fish movement. A fish pass solution needs



increase flood capacity.

1. The Mow Beck empties into the river immediately downstream of the weir. There are periodic water quality issues here which need to be addressed. Pollution prevention work is required on the Mow and Barrow Becks in particularly around the Trent Road Industrial Estate. There is an opportunity for local volunteers, e.g. River Care, to monitor the outfall and report issues.
2. A small berm has developed to the left of the Mow Beck confluence. This should be retained, but remodelled and potentially extended downstream to soften and add interest to the steep grass flood bank.
3. Between the Wyndham Park Weir and Belton Lane the river widens. The right bank is heavily eroded by people and dogs. There is an opportunity to repair the bank, e.g. using ash/hazel spilling and/or low level planted coil rolls to provide bank protection and create wetland habitat. Measures to prevent duck trampling/grazing are required to ensure the successful re-establishment of wetland vegetation. Potential location for educational river dipping area.
4. Downstream of Belton Lane, adjacent to Queen Elizabeth Park, although constrained between hard revetment/flood walls on much of the right bank and an earth flood bank on the left bank, the river is more natural in character. The low weir (11) at the bottom of this section is not an obstruction to fish movement or the natural sediment regime, and the gravel bed downstream could be enhanced as valuable habitat for native crayfish and fish spawning.

## Section 2.5. Sedgewick Meadows Weir (9) to Wyndham Park Weir (10)

1. The whole of the section is impounded by Wyndham Park Weir (10) and as a result is heavily silted with little channel diversity.
2. The National Trust owns the land at the upstream end of the section (Sedgewick Meadows on the right bank and the grounds of Grantham House on the left), all of which is identified as a Site of Nature Conservation Importance. The river here is heavily shaded with silty shallows and bare earth banks. Anglers and dogs are eroding the right bank and the rolled-stone path which is adding to the sediment problem.
3. In consultation with the National Trust undertake tree works (pollarding) to increase light to the channel. This will encourage the gradual development of a permanent wetland margin on the silt by natural processes or the process can be speeded-up by constructing a berm, which could incorporate fishing platforms. Increased light levels will also encourage the re-vegetation of the banks and reduce subsequent erosion.
4. The river downstream of the National Trust land, through the formal Wyndham Park, is constrained between a near vertical stone/block wall (right bank) and a concrete reinforced left bank toe. A small area of publicly-inaccessible South Kesteven District Council-owned land is located on the right bank.
5. The condition of this ornamental Wyndham Park Weir (10) is deteriorating and any plans to repair it should incorporate a fish passage solution.
6. Wyndham Park is the subject of a major Heritage Lottery Fund Parks for People project which is in the development phase. As well as the restoration and greening of the riverside, there are opportunities for riverside interpretation; educational projects to reconnect children and adults with the river environment e.g. river-dipping, growing of wetland plants for riverside planting; and volunteering opportunities through RiverCare for the public to take an active part in the management of the river.

1. Upstream of St Catherine's Rd the river is narrower than in other sections, initially being constrained between a wide bramble-covered left bank and hard revetment adjacent to the housing on the right bank then, downstream of the pedestrian/cycle bridge, between vertical concrete walls on both sides. There are no identified opportunities for improvement.
2. The Riverside Walk through this section, between here and Wyndham Park, forms part of the proposed South Kesteven District Council Green Link (a 1.9km "scenic" circular route). Outline plans identify signage, structural planting, bramble management and riverside interpretation.
3. The safety barrier at the bottom of Oxford St is not secure and needs to be repaired.
4. Downstream of St Catherine's Rd the river widens. The river is slow-flowing with poor diversity and the right margin, adjacent to the Stonebridge Close open space, is shallow and heavily silted. There is an opportunity here to improve the flow by narrowing the channel. The existing silt could be captured within a newly constructed low-level berm to create a 2-stage channel and encourage the development of a wetland margin. South Kesteven District Council is keen to establish nectar-source planting to encourage bees as pollinators.
5. Downstream of Stonebridge Rd, although the river is deeper, a similar low-level berm (2-stage channel) could be created on the left bank adjacent to the South Kesteven District Council managed housing.
6. On the opposite side of the river there are proposals to expand Grantham College. Proposals need to consider the relationship with the river and include SUDS measures to manage surface water/drainage, which could also incorporate wetland biodiversity enhancements. There are river-related volunteering opportunities for students through RiverCare.
7. The lower parts of this section is impounded by Sedgewick Meadows Weir (9) resulting in poor channel diversity (in terms of flow, depth, substrate) and limited ecological potential. The substantial head drop here is a barrier to fish movement and a passage solution needs to be developed, including consideration of the removal or lowering of the structure.
8. Immediately upstream of the weir are two developing berms, one on each bank, both of which should be retained.





Urban habitat improvement – Grantham, Lincoln and Sleaford



## Find Out More

<https://youtube/biWRCJ0zYW0>

[https://restorerivers.eu/wiki/index.php?title=Case study%3AUpper Witham Restoration](https://restorerivers.eu/wiki/index.php?title=Case_study%3AUpper%20Witham%20Restoration)

Manthorpe film -

<https://www.youtube.com/watch?v=PtZikLDHIP0>

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