

# Exploring Solutions in Knocklyon: *for the Dodder River Catchment*

Knocklyon  
19 August 2024



Background:

Why do we need to think about water?



Mayfly nymph

Damselfly nymph

Damselfly Nymph (common blue?)



Dragonfly Nymph



Ramshorn snail



Water louse



Dragonfly Nymph



Cased Caddisfly



Water Beetle

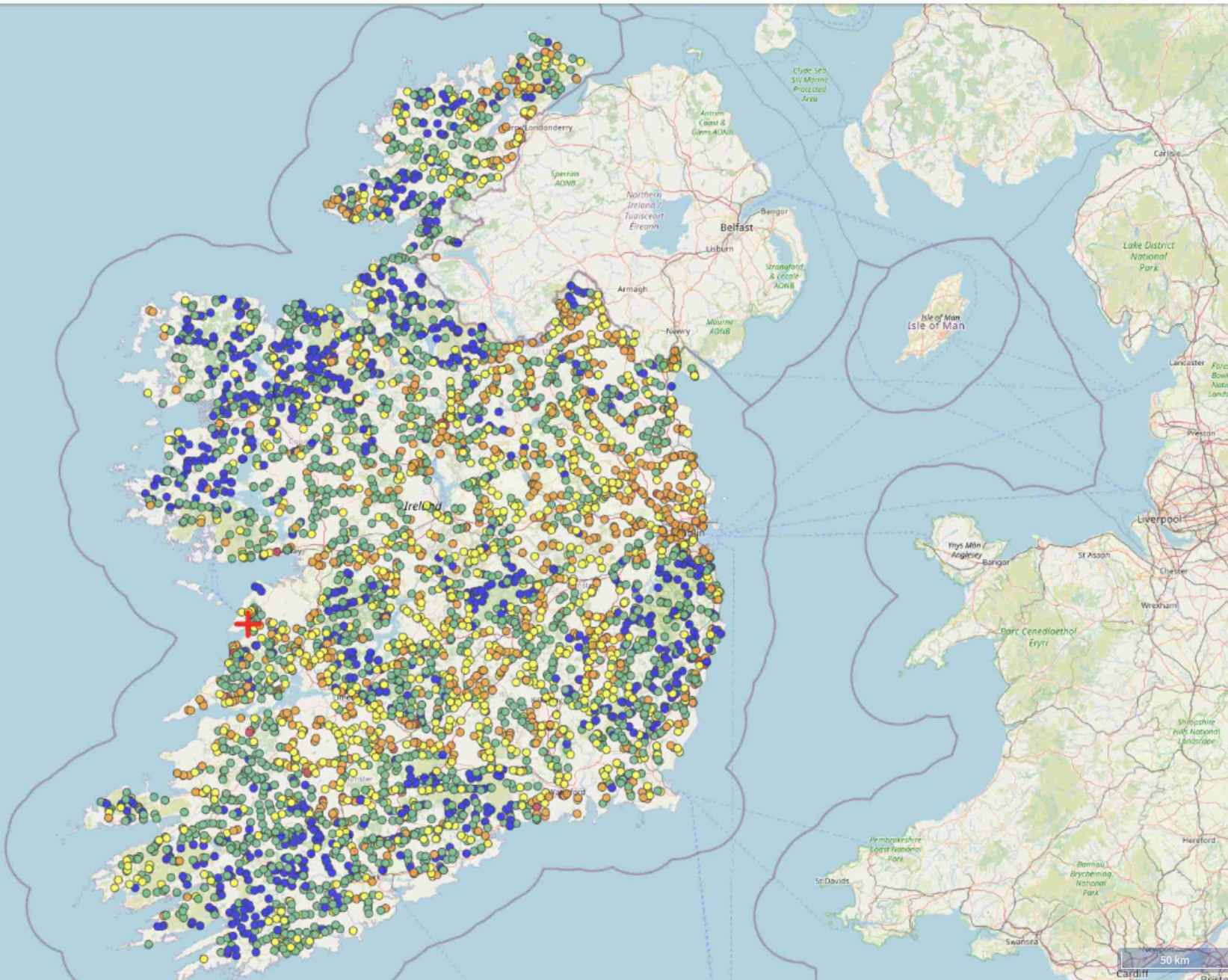


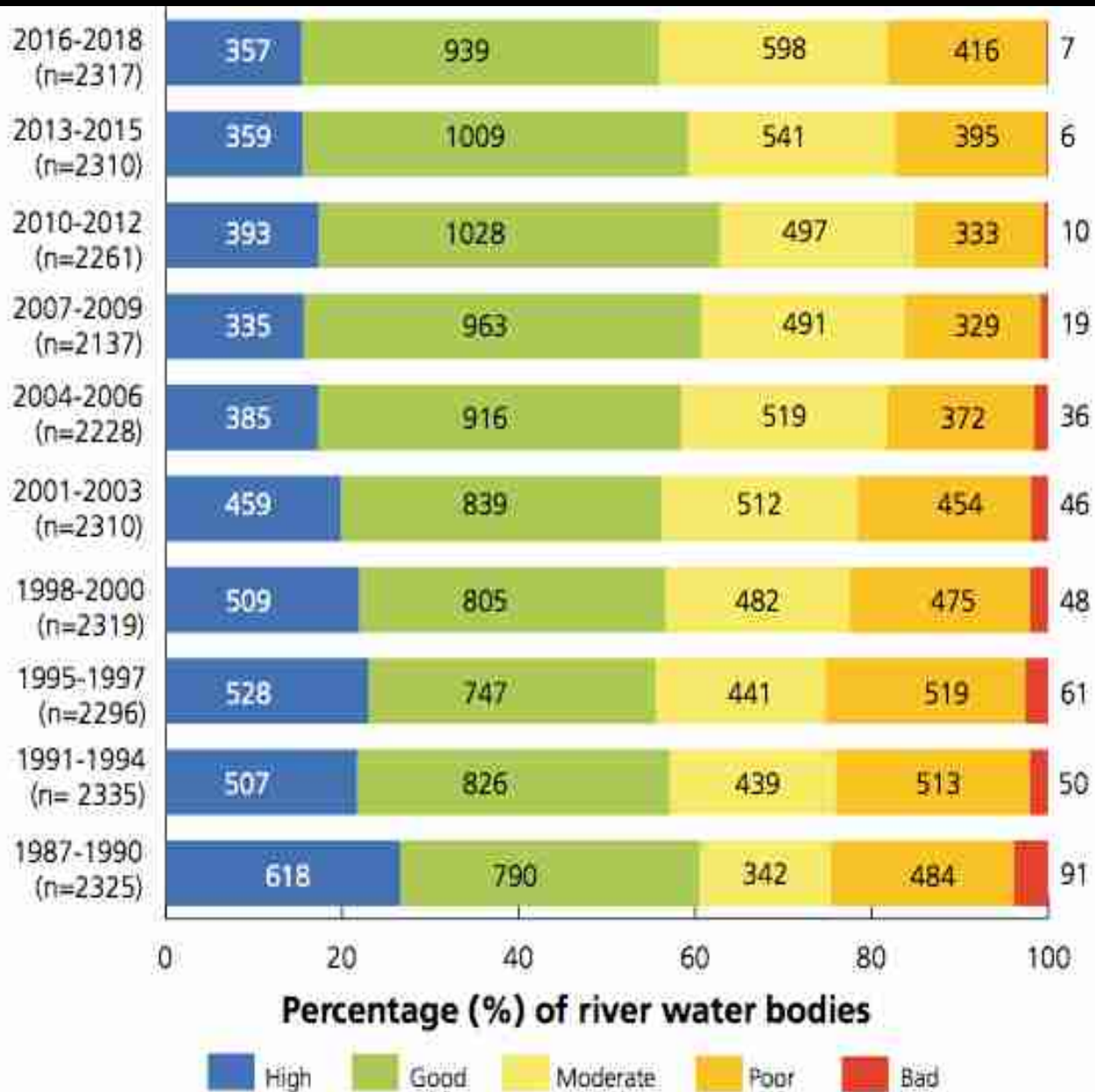
Pond Skater



Whirligig Beetles

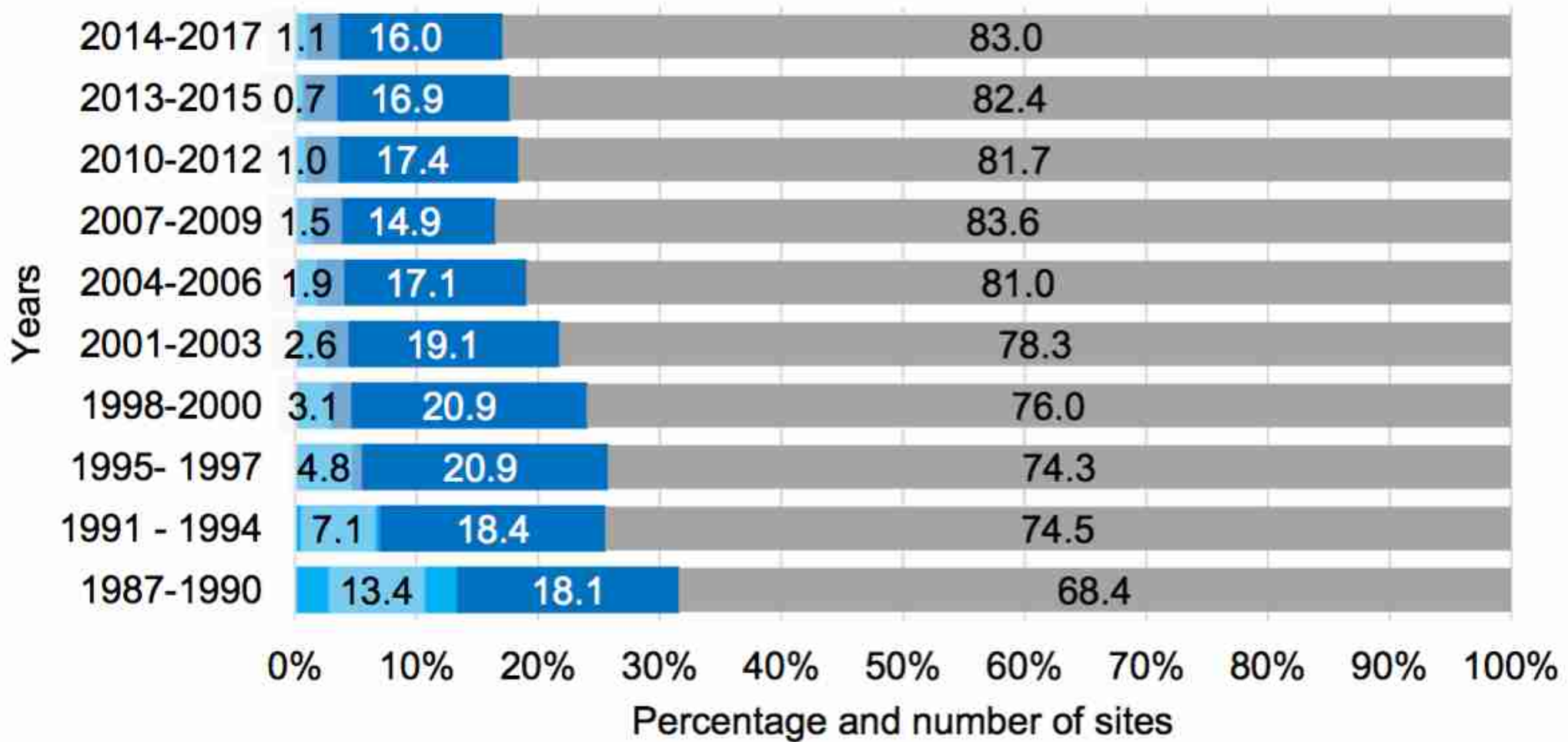
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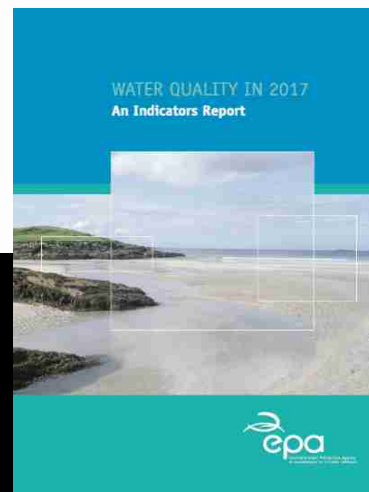
**Figure 2.8:** National trends in macroinvertebrate quality of water bodies using the Q-value rating system between 1987 and 2017. Number in parentheses on y-axis is total number of water bodies

# High-Quality River Sites



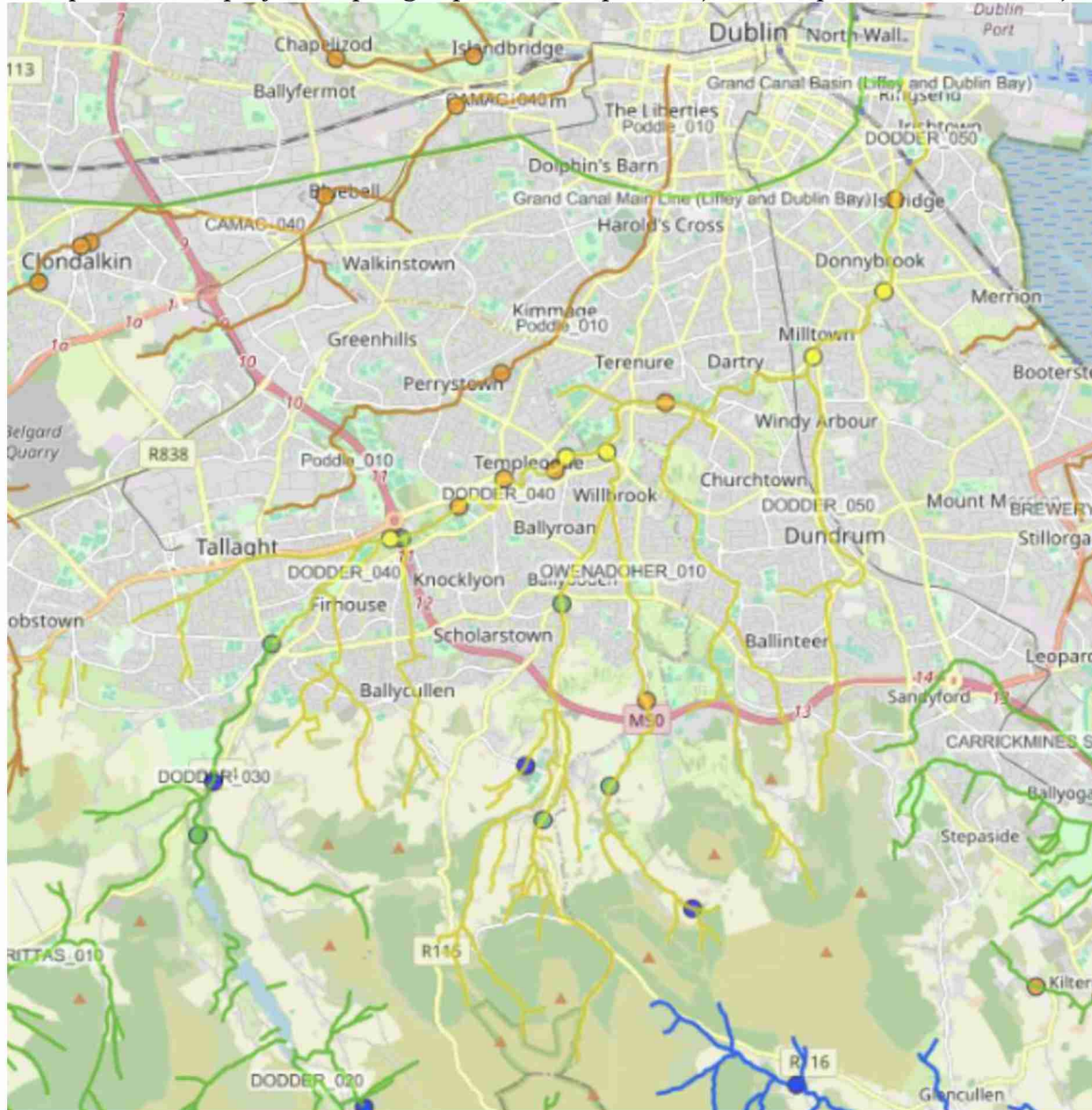
■ High quality and reference conditions (Q5)
 ■ High quality (Q4-5)

Figure 2: Trend in the percentage of high-quality river sites (Q5, Q4-5) since 1987.



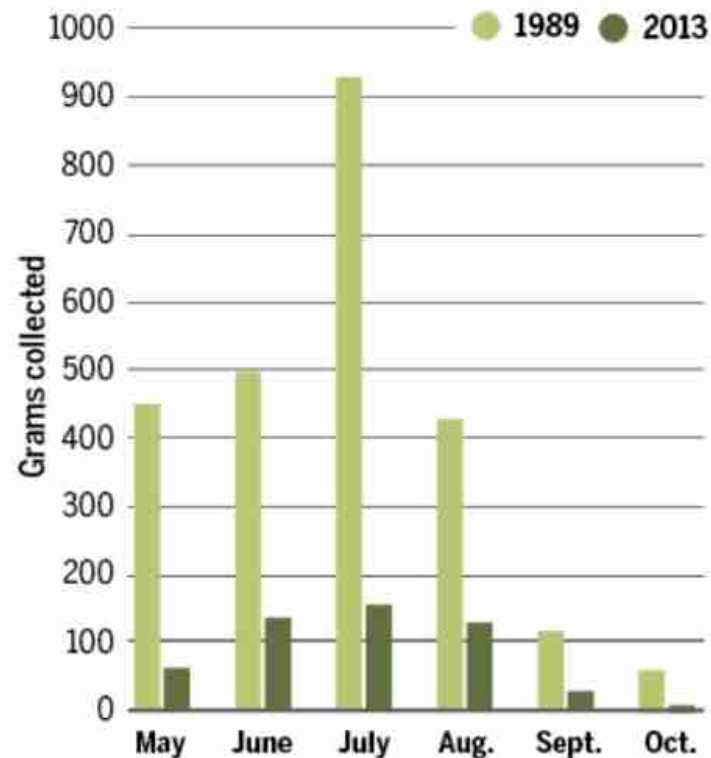
*Dodder River catchment showing river quality status (channel colour) and Q-value results at distinct locations shown (coloured dots)*

*(Source; Open Street Maps (from <https://gis.epa.ie/EPAMaps/Water>), under Open Database Licence)*



# Weighty disappearances

The mass of insects collected by monitoring traps in the Orbroicher Bruch nature reserve in northwest Germany dropped by 78% in 24 years.



(GRAPHIC) G. GRULLÓN/SCIENCE; (DATA) M. SORG ET AL., MITTEILUNGEN AUS DEM ENTOMOLOGISCHEN VEREIN KREFELD 1, 1–5 (2013) © 2013 ENTOMOLOGISCHER VEREIN KREFELD

Science

<https://www.science.org/content/article/where-have-all-insects-gone>



What does clean water look like?

What does pollution look like?



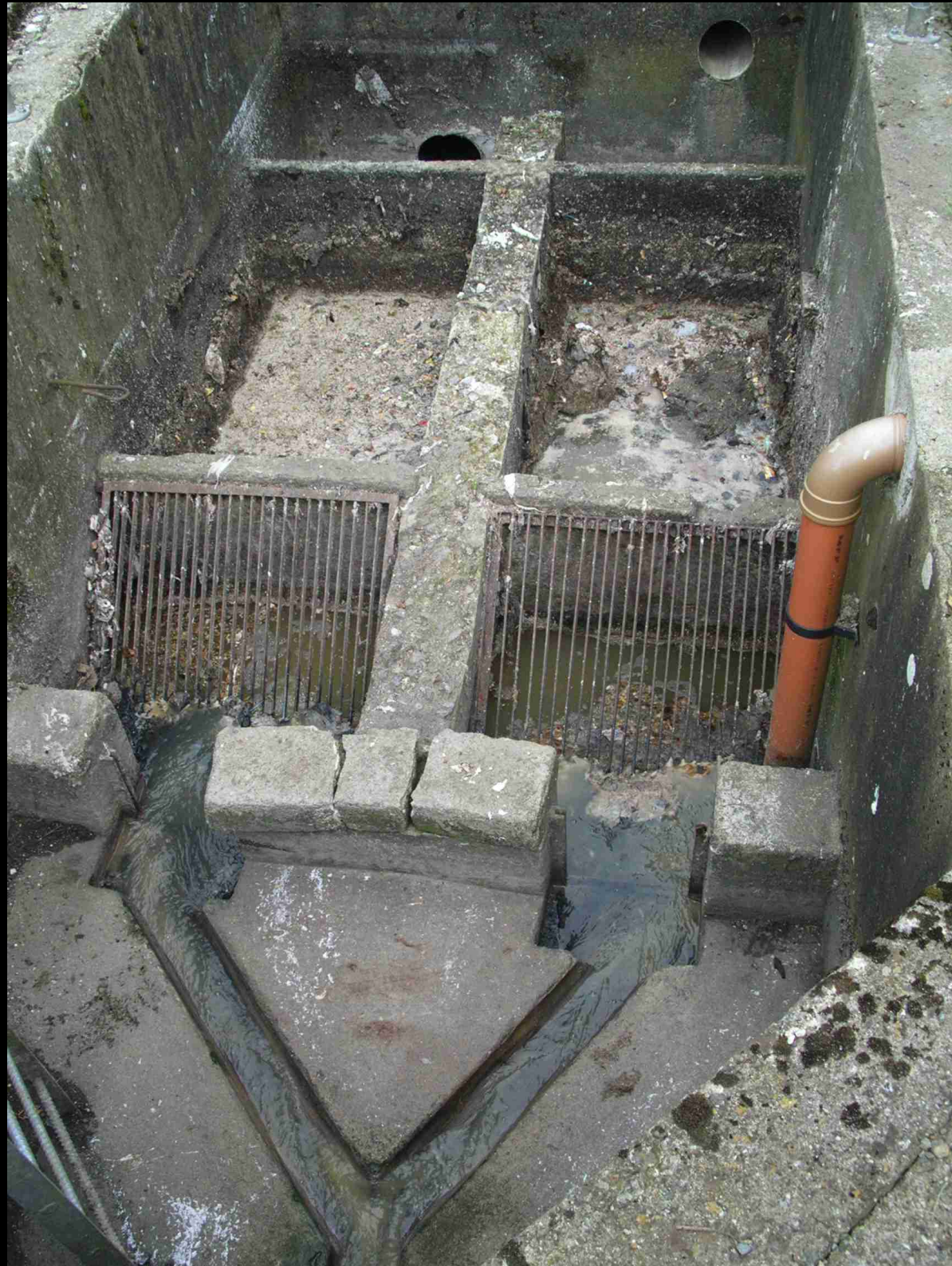








What are some of the challenges?









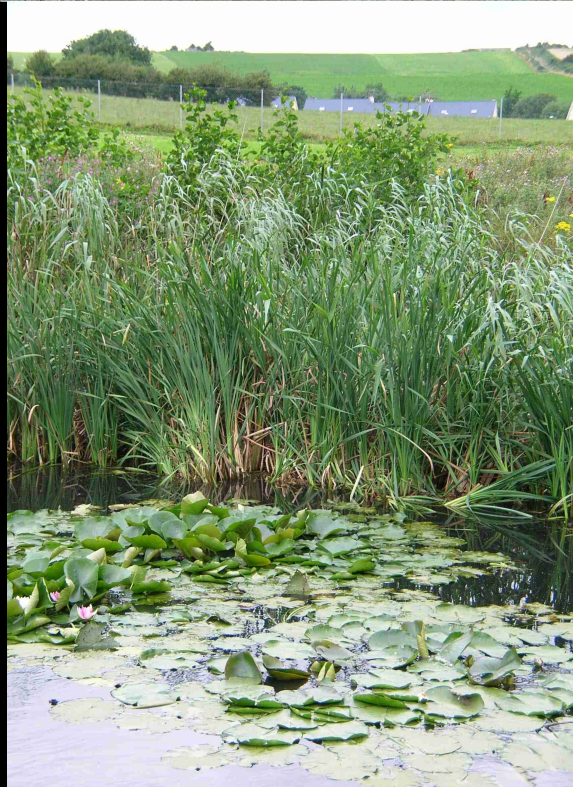


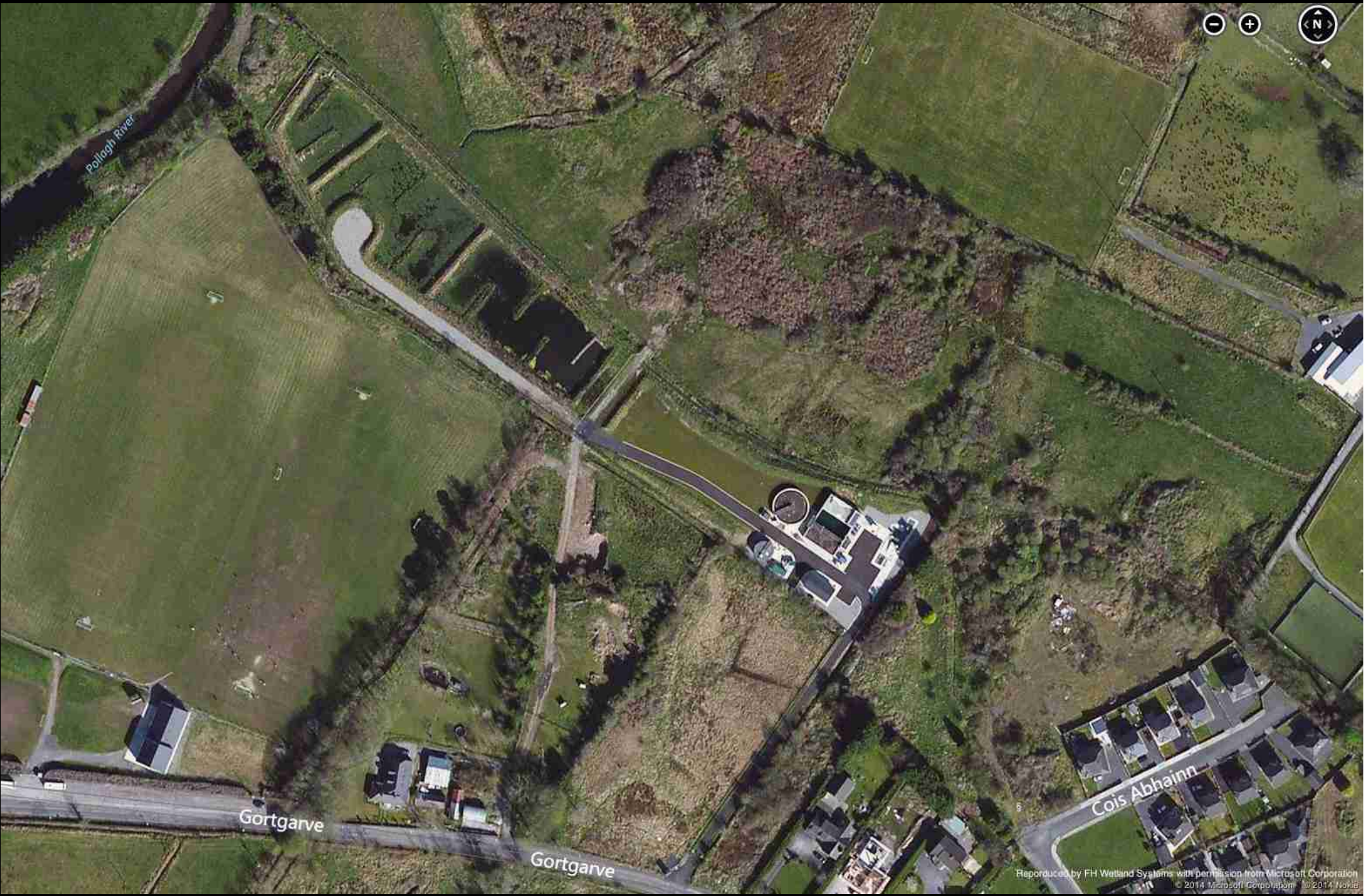
An aerial view taken on Wednesday October 18th of flooding in Midleton, Co Cork after Storm Babet. Photograph: Guileen Coast Guard





Exploring some solutions  
in the wider catchment





Pollagh River

Gortgarve

Gortgarve

Cois Abhainn



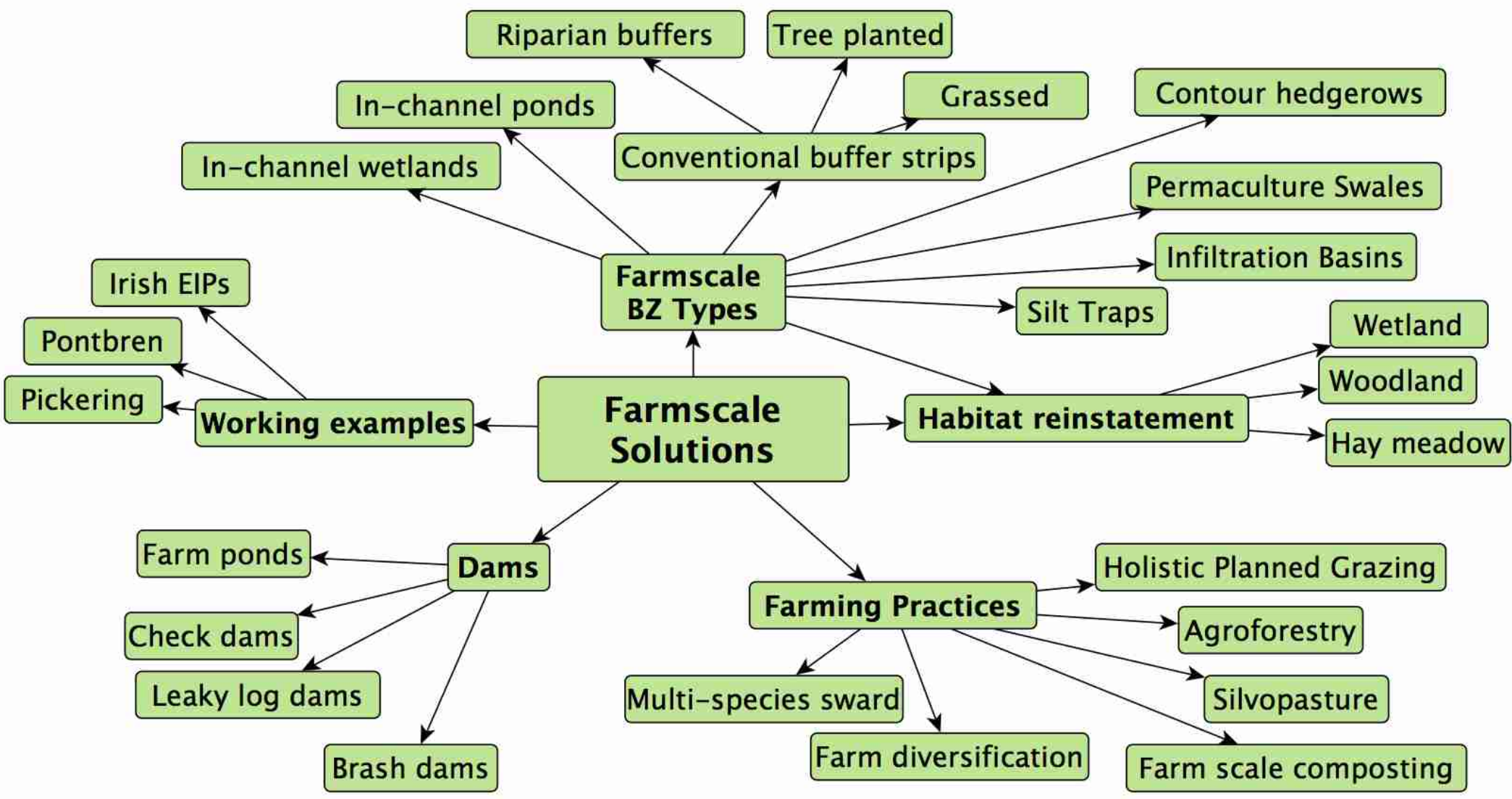




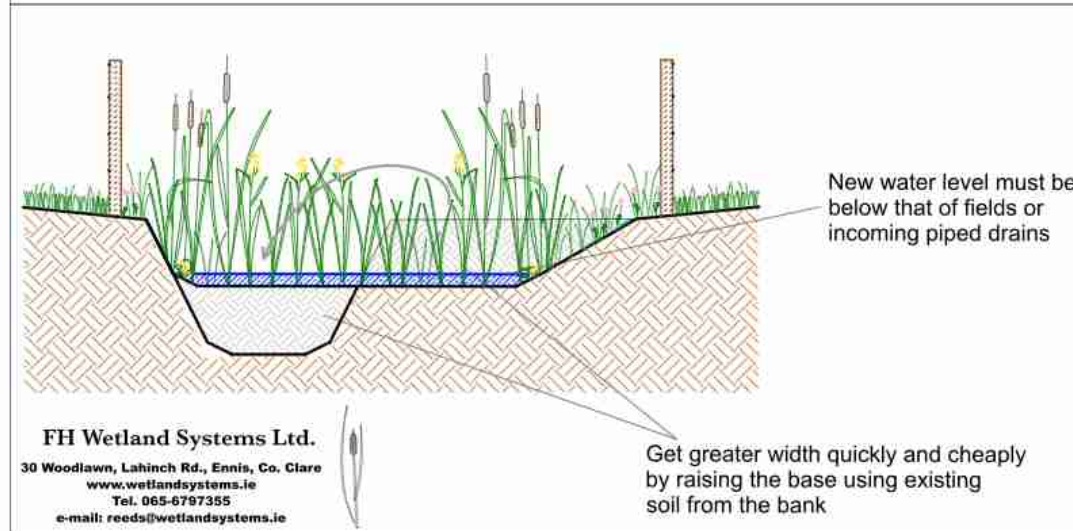
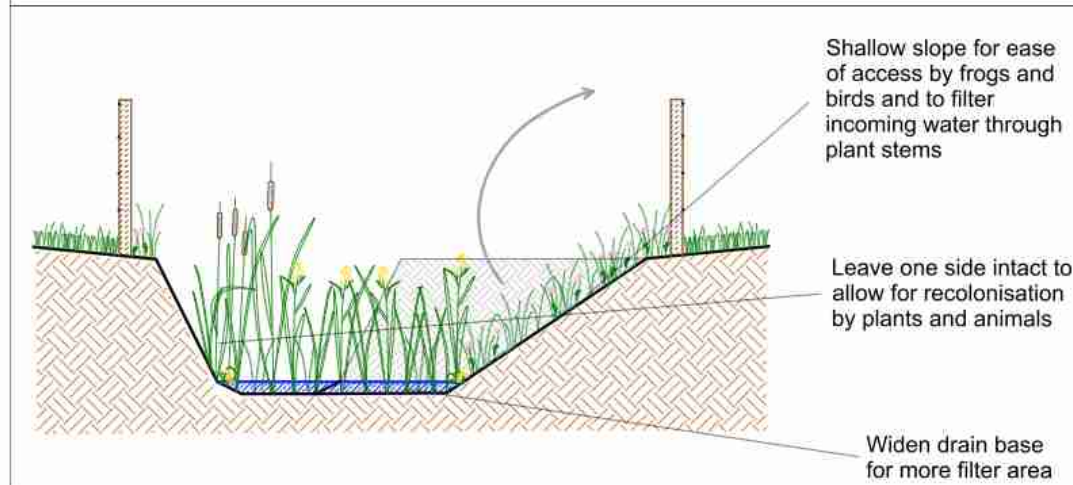
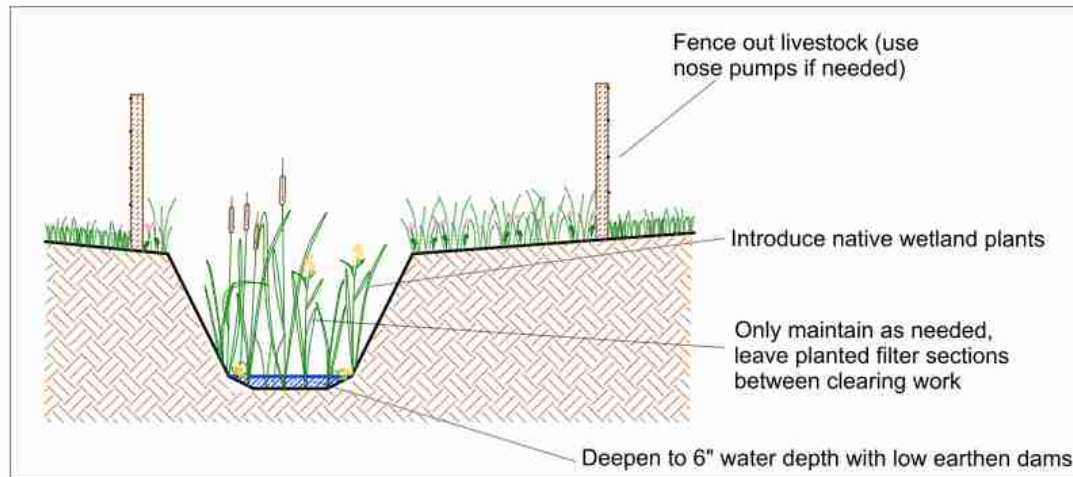


Photo: Inish Forestry, Donegal



Photo: Inish Forestry, Donegal

# Drain works for water quality and habitat enhancement



**FH Wetland Systems Ltd.**  
30 Woodlawn, Lahinch Rd., Ennis, Co. Clare  
[www.wetlandsystems.ie](http://www.wetlandsystems.ie)  
Tel. 065-6797355  
e-mail: [reeds@wetlandsystems.ie](mailto:reeds@wetlandsystems.ie)

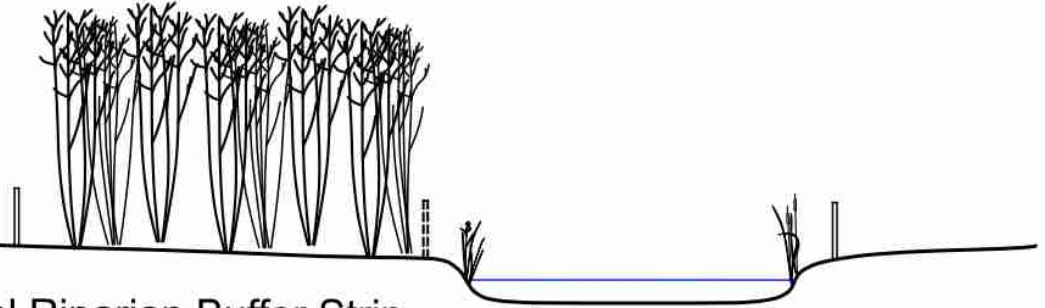






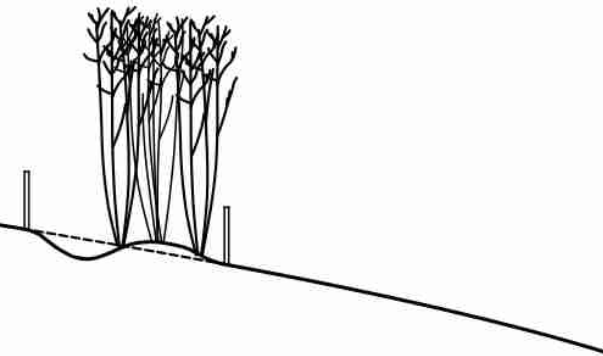


## *Silt Traps for field runoff*



Silt Trap for field runoff in the form of a Conventional Riparian Buffer Strip.

(Essentially a wider fenced area bordering the river. May be left to develop naturally as long grasses and wildflowers or planted with wetland plants to filter the surface runoff; or plant with willows or other native deciduous trees for subsurface flow filtration. The wider the strip the greater the uptake of silt, N and P.)

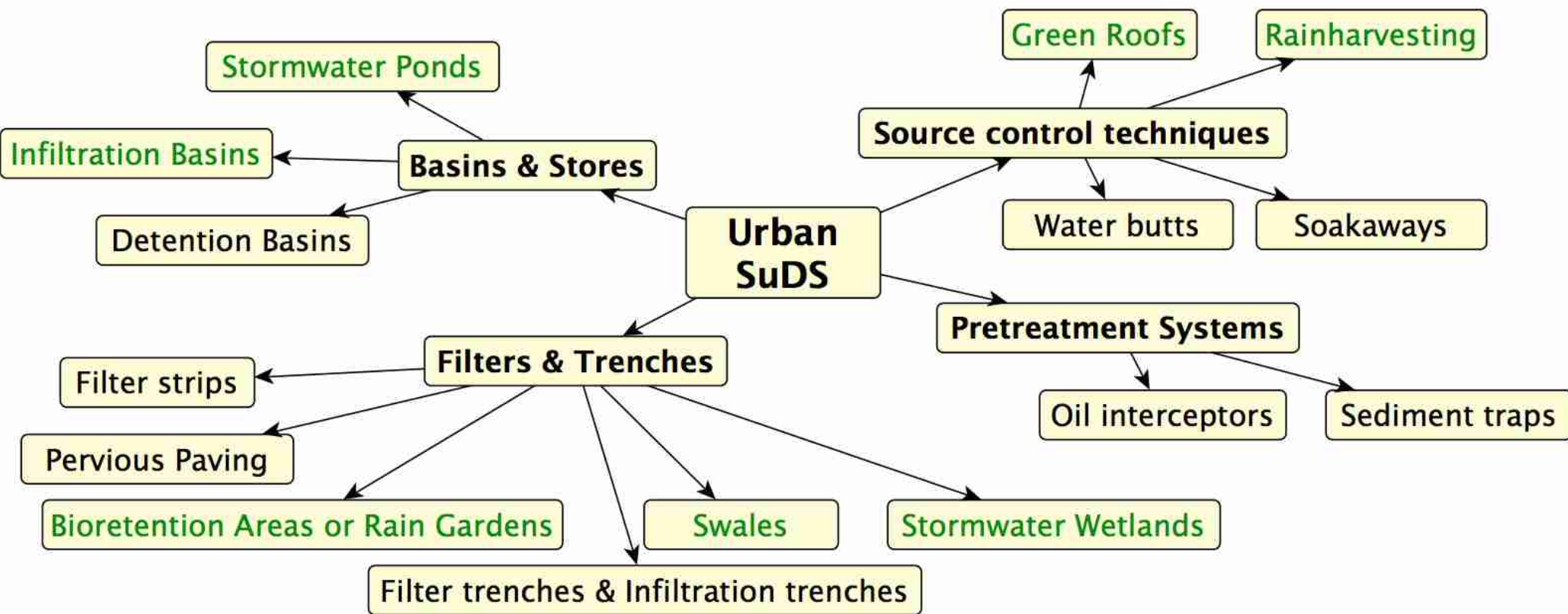


Silt Trap for field runoff filtration, in the form of a Contour Swale and Mound.

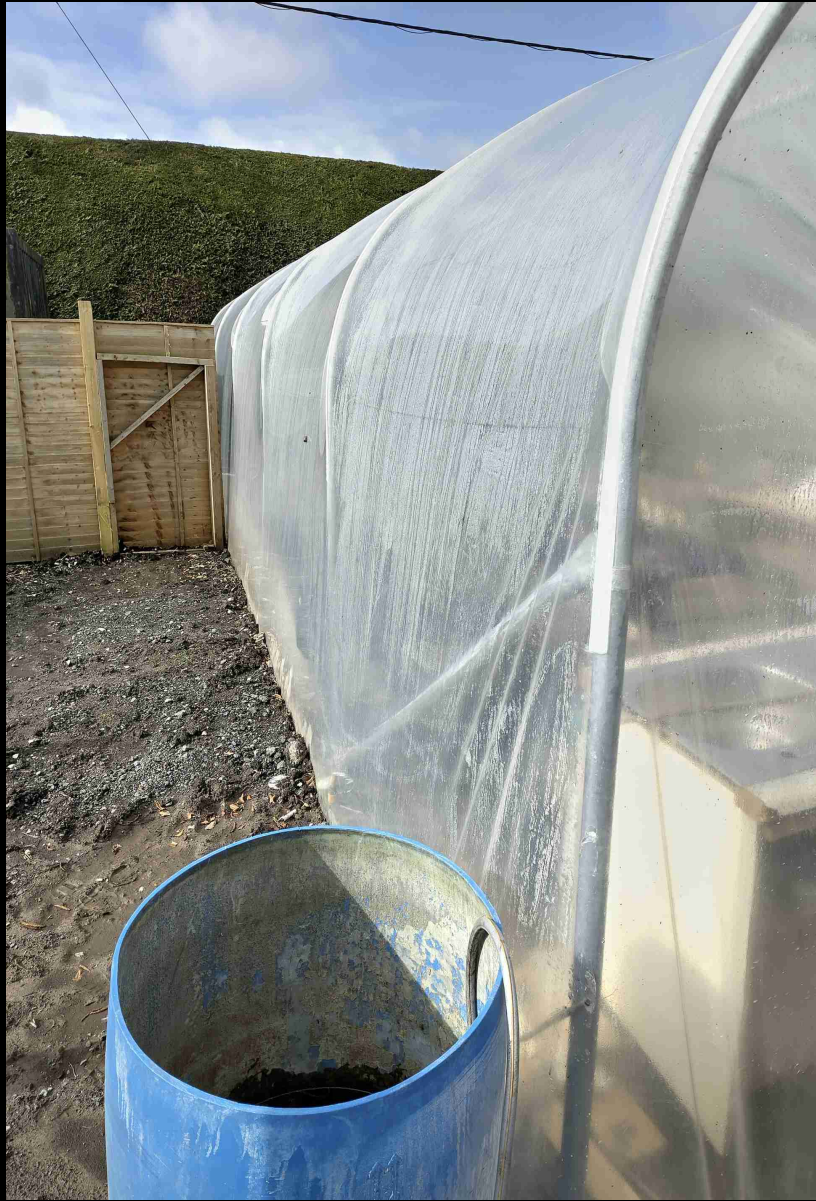
(Plant with any deciduous trees for greater infiltration and habitat value.)

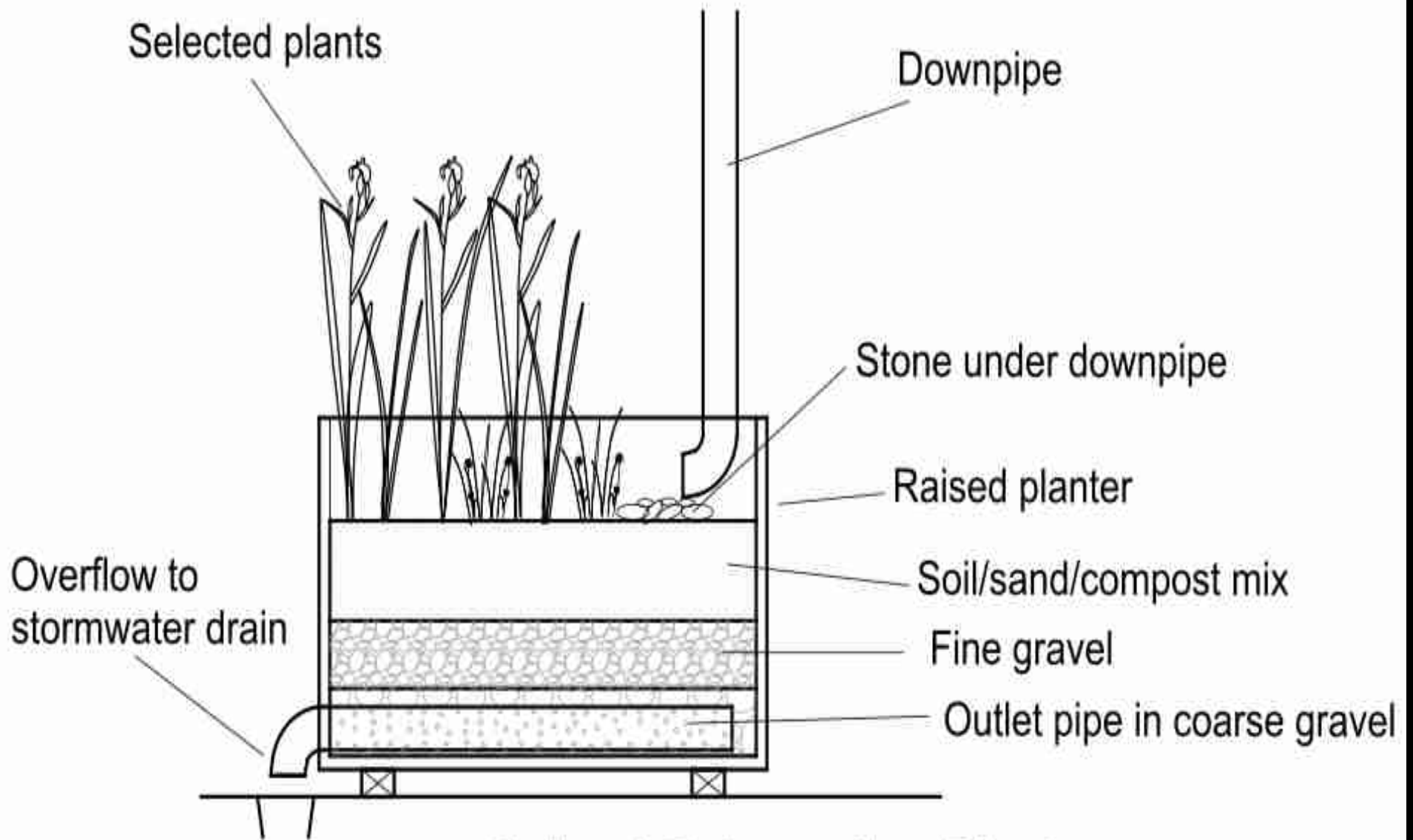


# Solutions for urban areas









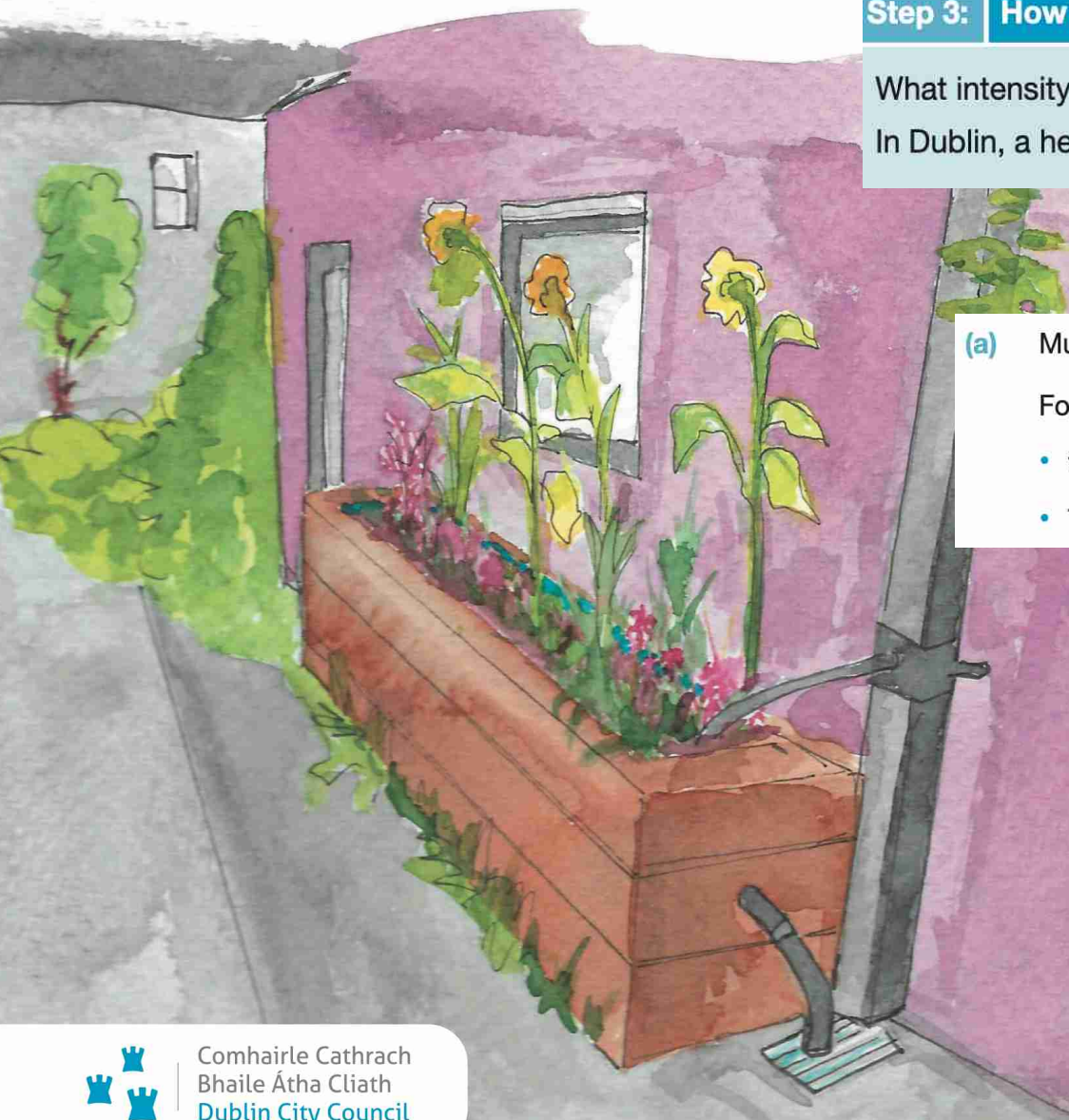
Raised Raingarden Planter





# A how-to-guide for Rainwater Planters

Design and build your very own rainwater planter



## Step 3: How much rain will you expect?

What intensity rainfall event are you designing for?

In Dublin, a heavy rainfall event would produce up to 25.4 mm (1 inch) of rainfall.

(a) Multiply the length (L) and width (W) of the roof area to find the surface area.

For this example:

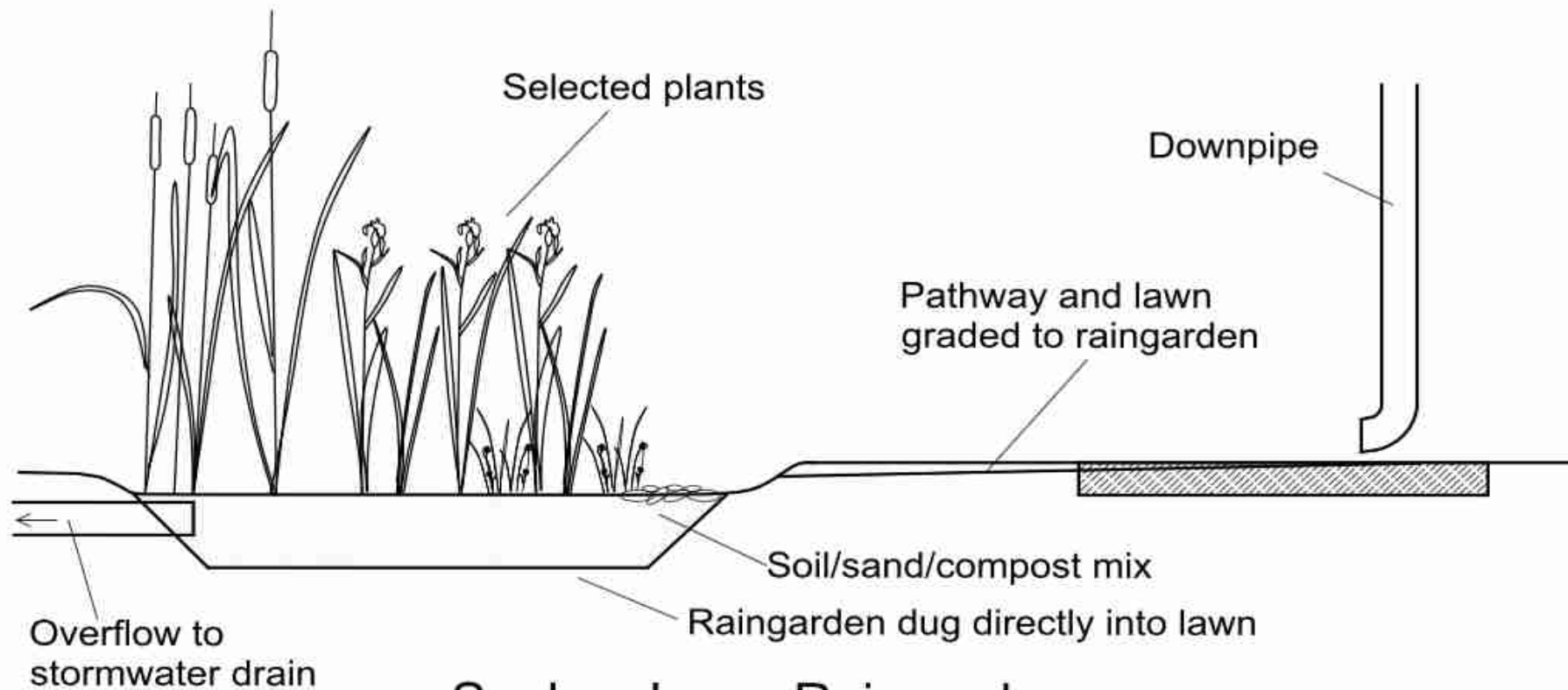
- the length is 6 metres, and the width is 3 metres.
- The surface area is  $6\text{m} \times 3\text{m} = 18\text{m}^2$ .

(g) You have now designed your planter and it has dimensions:

- 180cm long
- 60cm wide
- 45cm deep

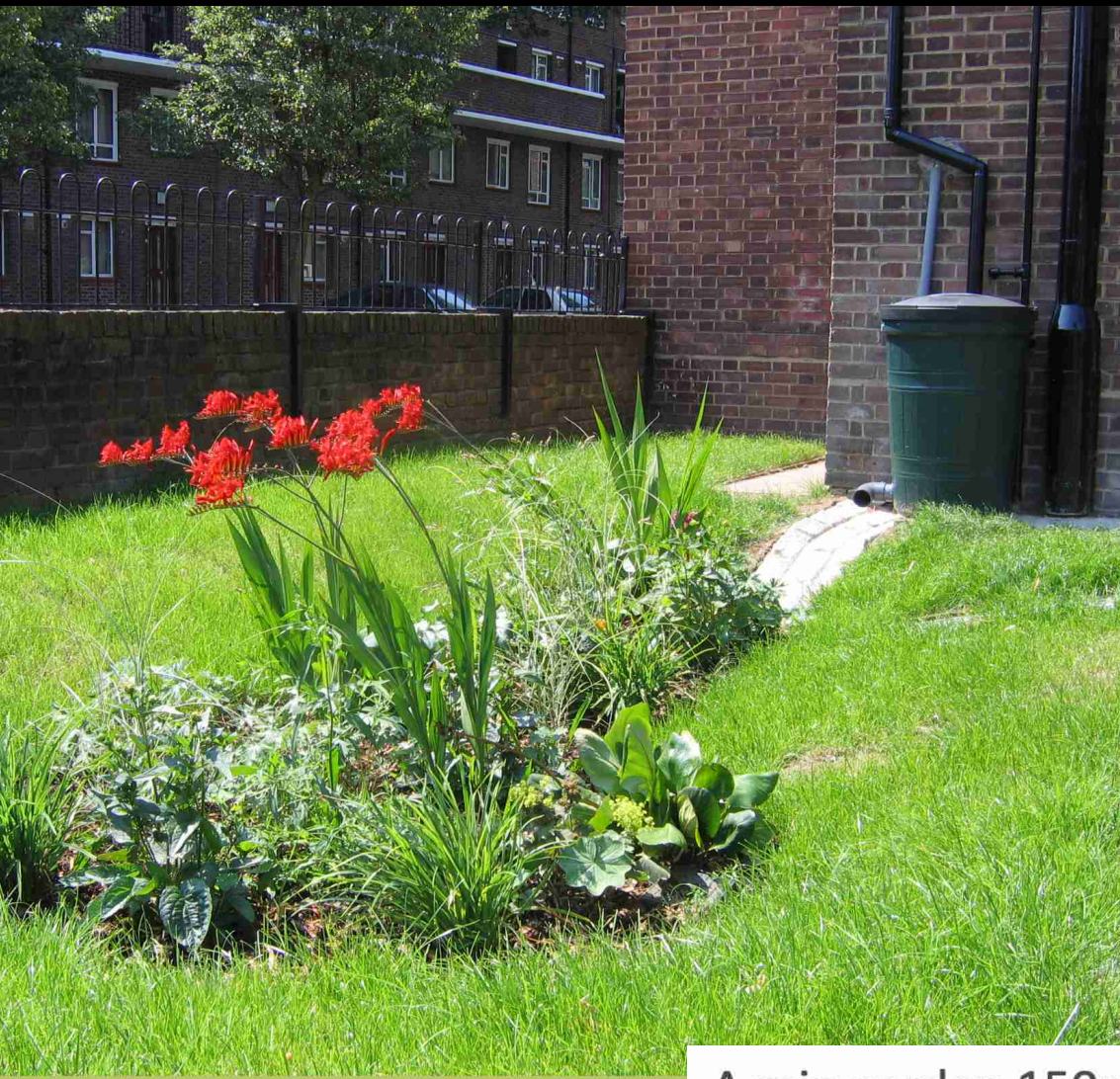


Comhairle Cathrach  
Bhaile Átha Cliath  
Dublin City Council



Sunken Lawn Raingarden





If the area of your roof feeding to the rain garden is 4m x 12m (front or back of house only), the area will be 48m<sup>2</sup>.

48m<sup>2</sup> x 15mm of rainfall = 0.72m<sup>3</sup> in a heavy summer shower.

Rain garden of 48m<sup>2</sup> x 20% = 9.6m<sup>2</sup>

150mm depth x VR of 0.3 = 105mm effective depth

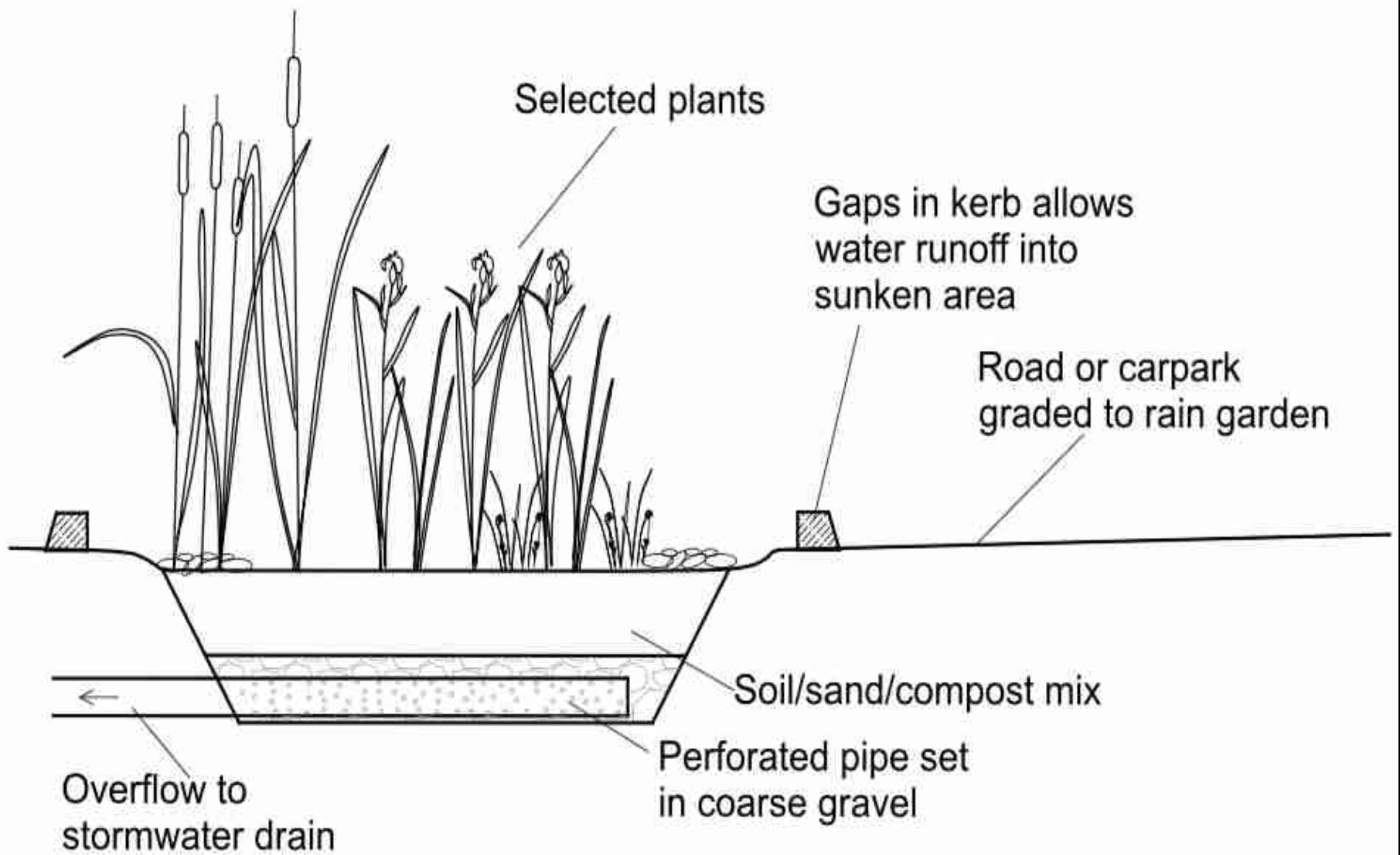
Thus the storage volume = 1.008m<sup>3</sup>

So the 20% size offers more area than will be required to store a 15mm rainfall event, if there is enough soakage into the soil to free up the space before the next rainfall event.

# RAIN GARDEN GUIDE

Bob Bray, Dusty Gedge, Gary Grant & Lani Leuthvilay

A rain garden 150mm deep and 20% of the area of the area of the roof that it serves will be able to intercept all of the run-off from a typical summer storm where 10-15mm of rain might fall. Rain gardens on more permeable soils will be even more effective. Over the course of an average year, a rain garden of this size will intercept most of the rainfall that it receives, only overflowing after several days of persistent rainfall.



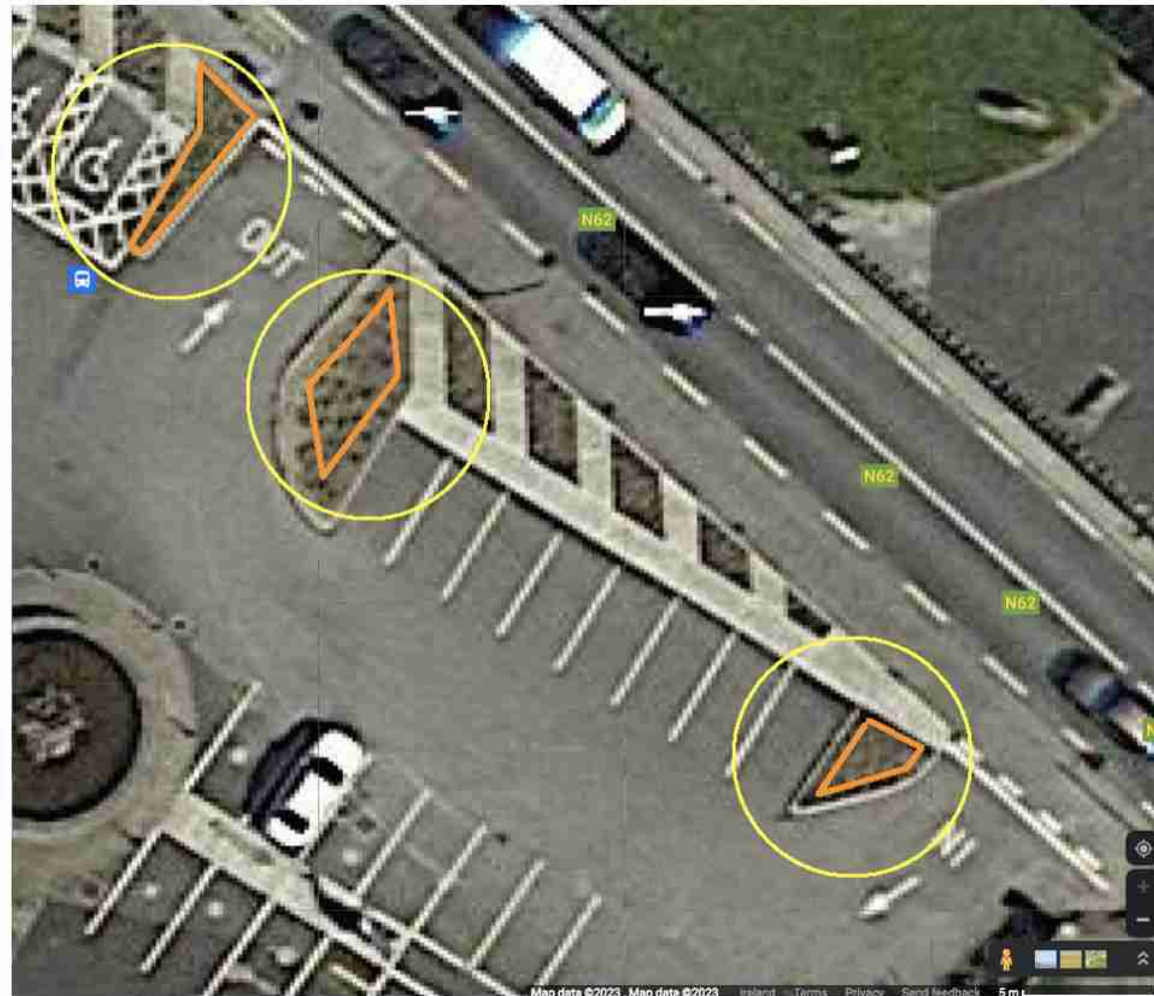
Sunken Kerbside Raingarden





The works consist of the following process:

1. Remove the existing top-soil level at the three planted triangles at the entrances to the car park (from some or all of the area of each triangle). Set to one side for reuse.
2. Dig out subsoil to a depth of 30cm and set aside for reuse.
3. Dig out deeper subsoil (poorer quality and more compacted) to a depth of another 30cm and remove from the site.
4. Replace upper subsoil layer - without compacting.
5. Replace topsoil layer such that the top ground surface slopes gently to the centre and is all below tarmac level - the aim is to allow rainfall to flow unhindered from the car park into the new bioretention area / rain garden surface and then soak in over time.
6. Remove kerb stones at the lowest point of the tarmac around each triangle. Cut in half and replace half in the gap where one was removed. I estimate that only 5-6 kerb stones may need to be removed in total.
7. Tidy up around site works.
8. (Planting to be carried out by local community after works are complete).

















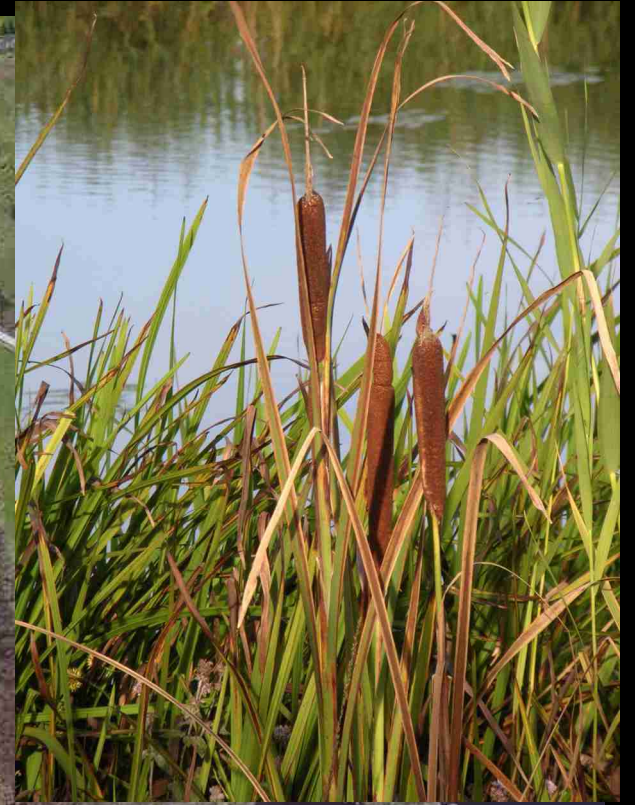


Geashill Tidy Towns

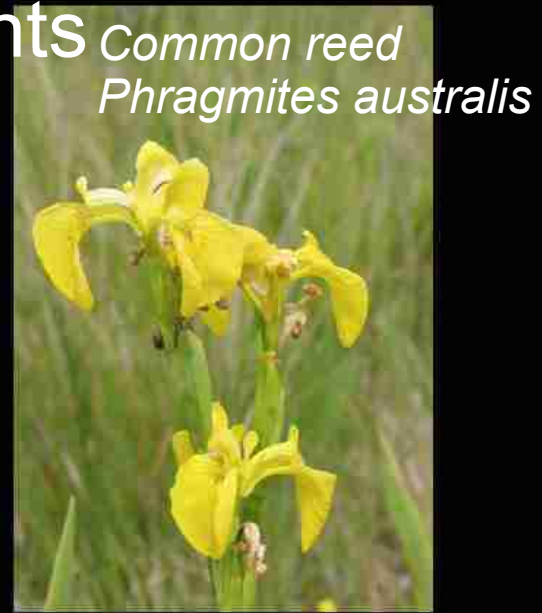








# Main tall wetland filter plants



Common reed  
*Phragmites australis*



Common reed  
*Phragmites australis*

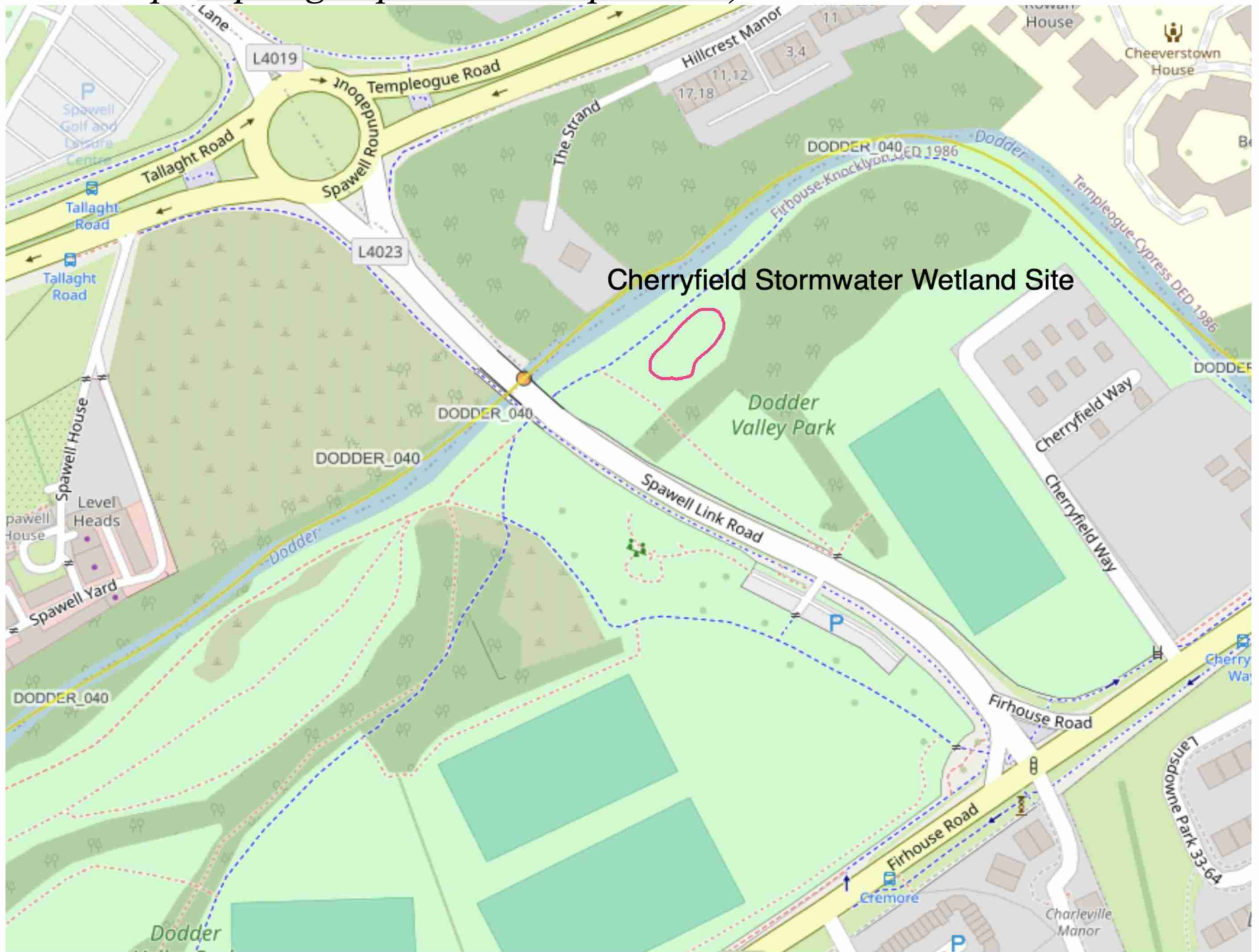


Common reed  
*Phragmites australis*

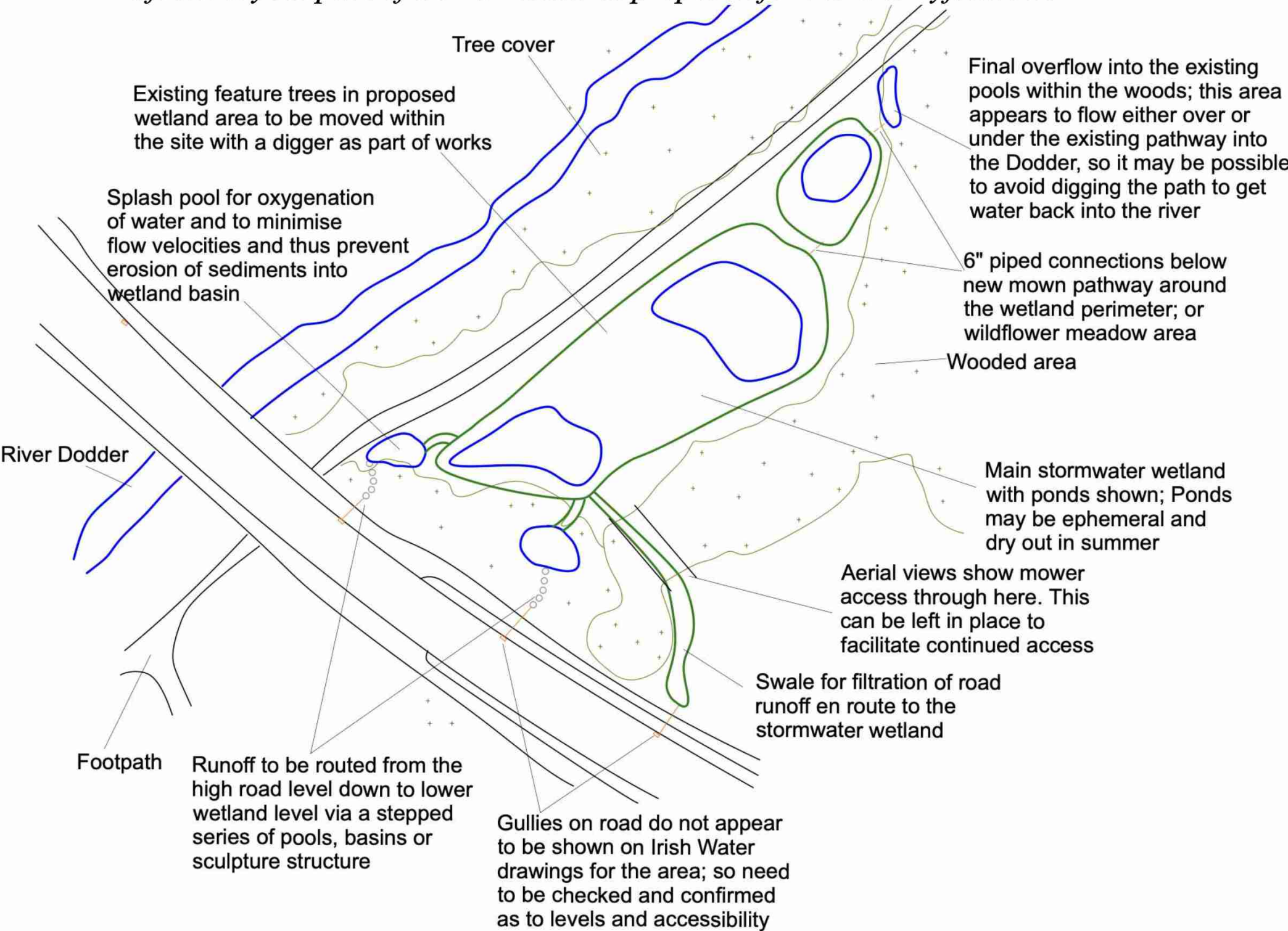


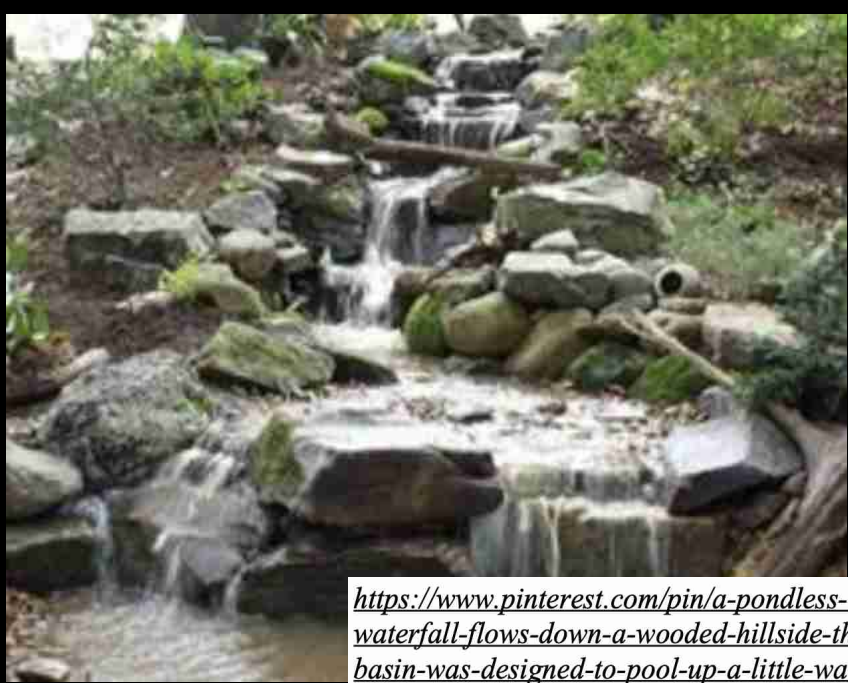
Branched Burr Reed  
*Sparganium erectum*

*Proposed location of stormwater wetland and SUDS features at Cherryfield.*  
(Source Map: <https://gis.epa.ie/EPAMaps/Water>)



# Draft site layout plan of SUDS measures proposed for the Cherryfield site





<https://www.pinterest.com/pin/a-pondless-waterfall-flows-down-a-wooded-hillside-the-basin-was-designed-to-pool-up-a-little-water-for-the-many--558164947544949525/>



<https://www.pinterest.com.au/pin/730146158343275133/>



<https://www.dezeen.com/2013/10/06/botanical-garden-in-australia-wins-world-landscape-of-the-year-2013/>



<http://themuseumtimes.com/the-miracle-moses-bridge-near-halsteren-netherlands/>

Recreating habitat space for wildlife













Photo: Male MacDonald, [CC BY-SA 2.0](https://creativecommons.org/licenses/by-sa/2.0/)  
<https://www.geograph.org.uk/photo/4564227>

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