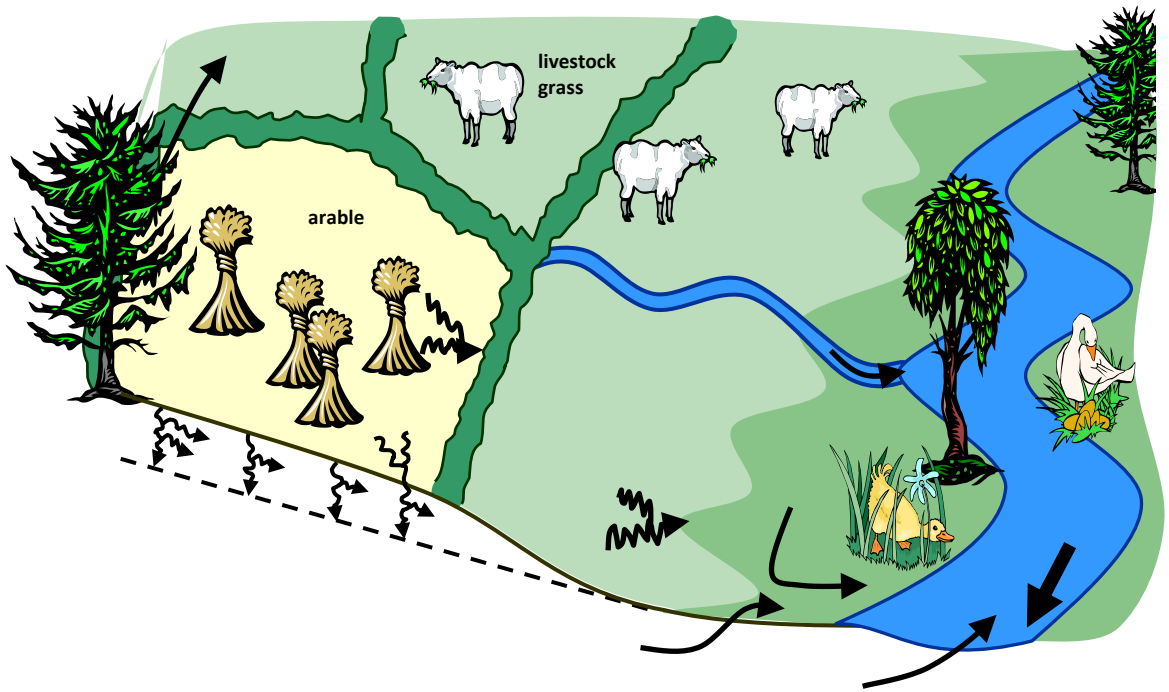
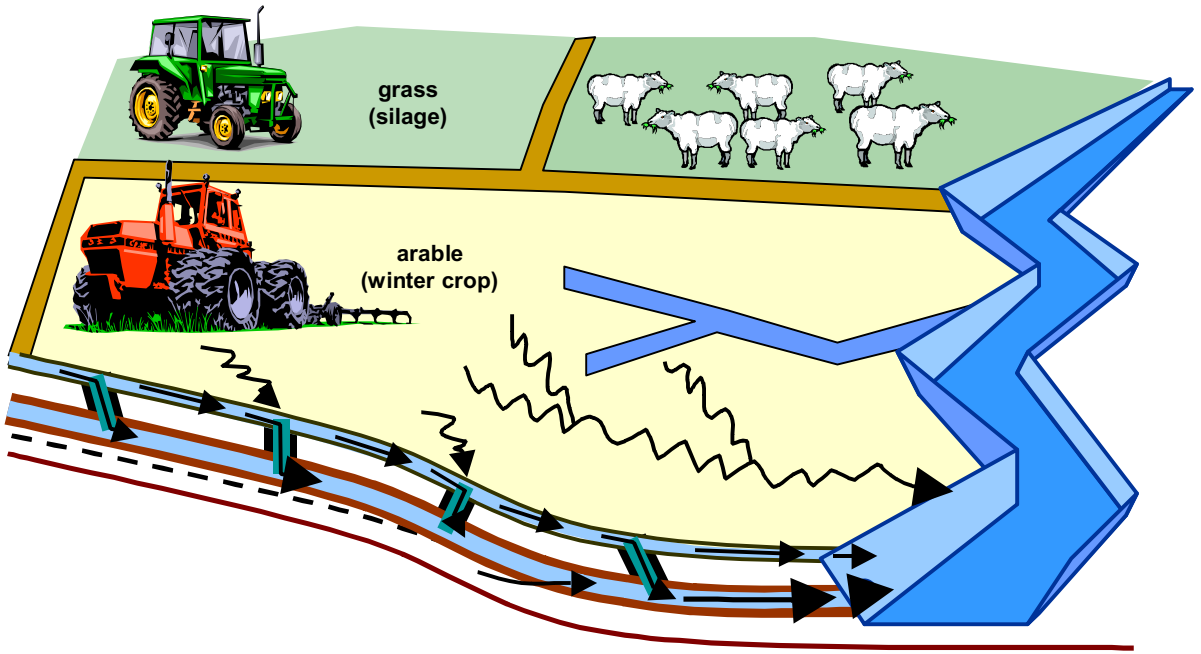
How to design and build NbS on Irish farms for flooding?

Or Slowing and Storing Flood Flow on Farms

SloWaters Team, Teagasc, and 25 Years of Collaboration

Change in Runoff - Complex





A fast flowing, low storage landscape

Slo flow and store flow – that is all it is!

What are we looking for?

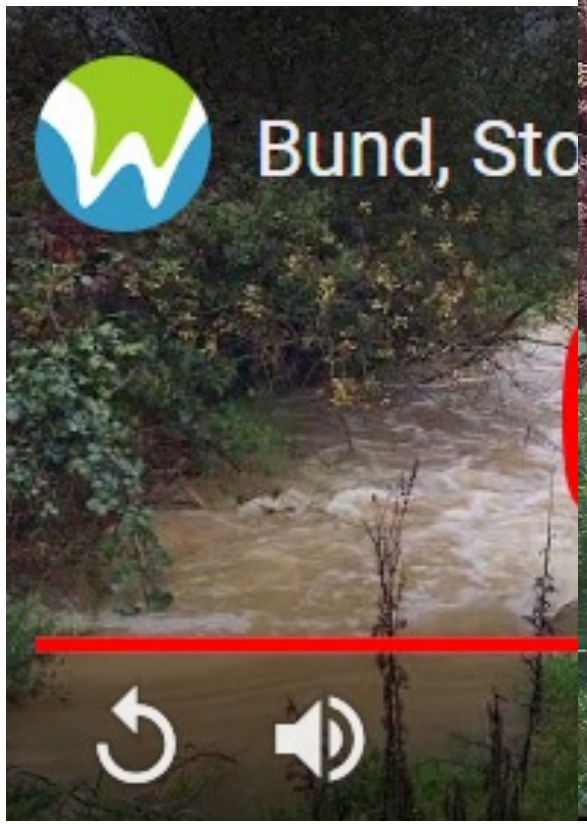
- Where?
- Why?
- How?
- Who?

The right place, designed well and for the right purpose

Or purposes

Can we store large amounts of flood water on farms?

- YES … but



- YOU need to get the right flow in and out

What to build?

The biggest possible storage pond from local materials.

Usually, a soil bund with maximum height 1m.

Do water quality NbS address flooding?

- **Some impact but you will need many**
- **If features are too small, they will not work for flooding**
- **Features will overtop and may erode**
- **You must design in an overflow option**

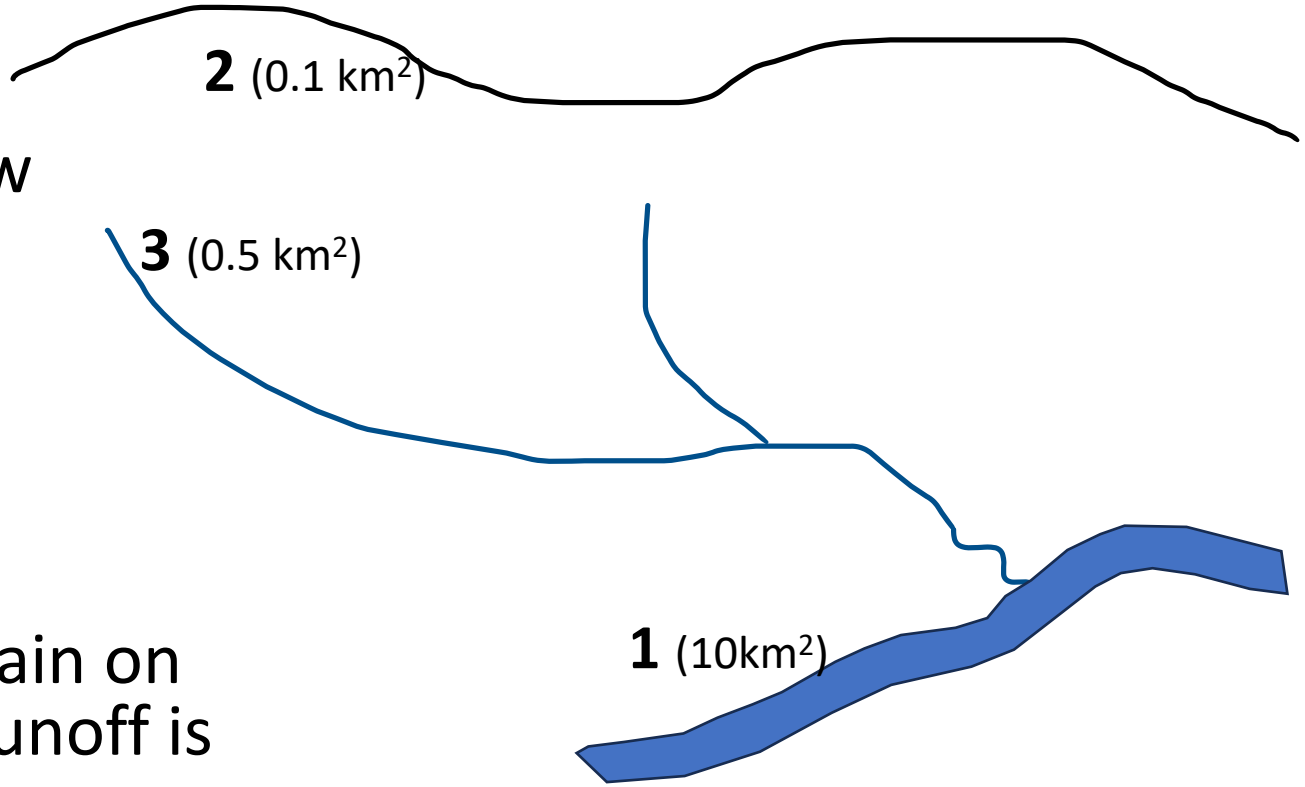
If you slow flow, you then create the new storage!
If you cannot store the flow then the feature will not work and it may cause other problems

The Recipe

Step 1 – where to start

- Go to your site with maps and friends

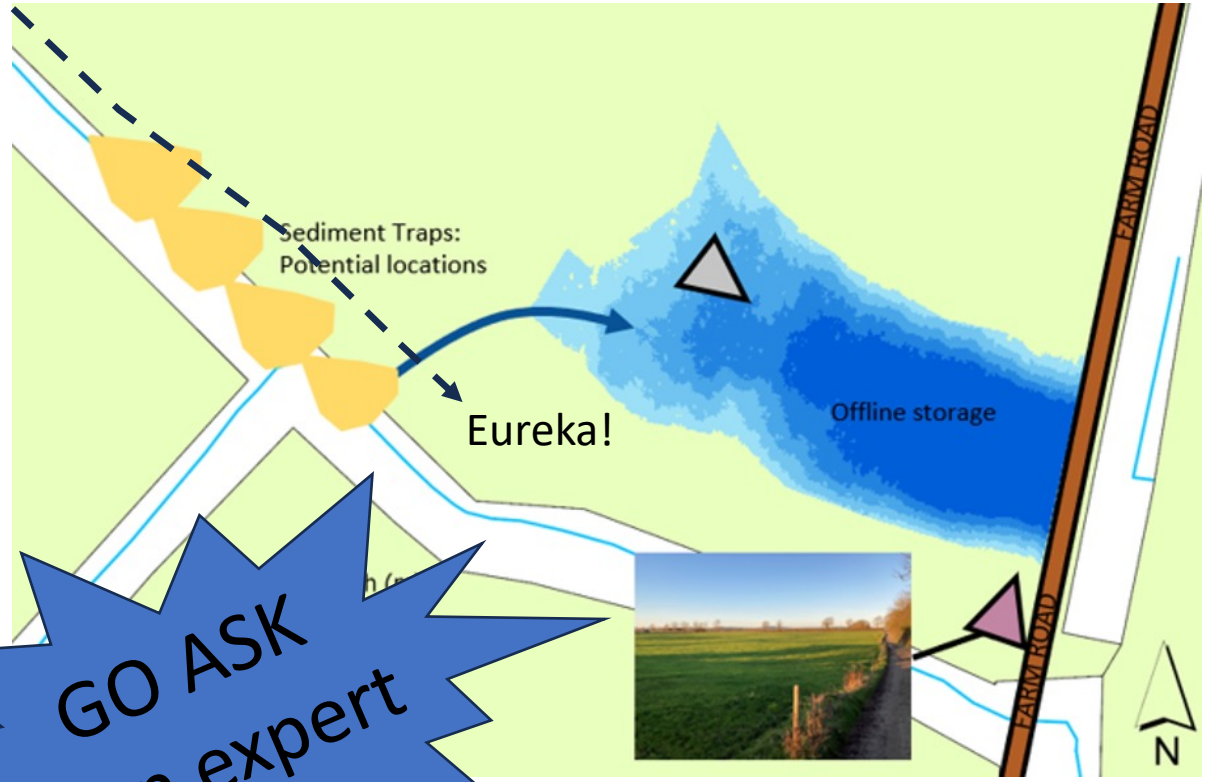
- 1. Too big
- 2. Little flow but a nice view
- 3. Perfect



Hint: find the first flowing drain on the farm OR a place where runoff is often seen in a field

Step 2, Follow the drain downstream

- Search for a natural hollow/depression or somewhere flat like a floodplain where a small bund could stop flow. Offline is always best



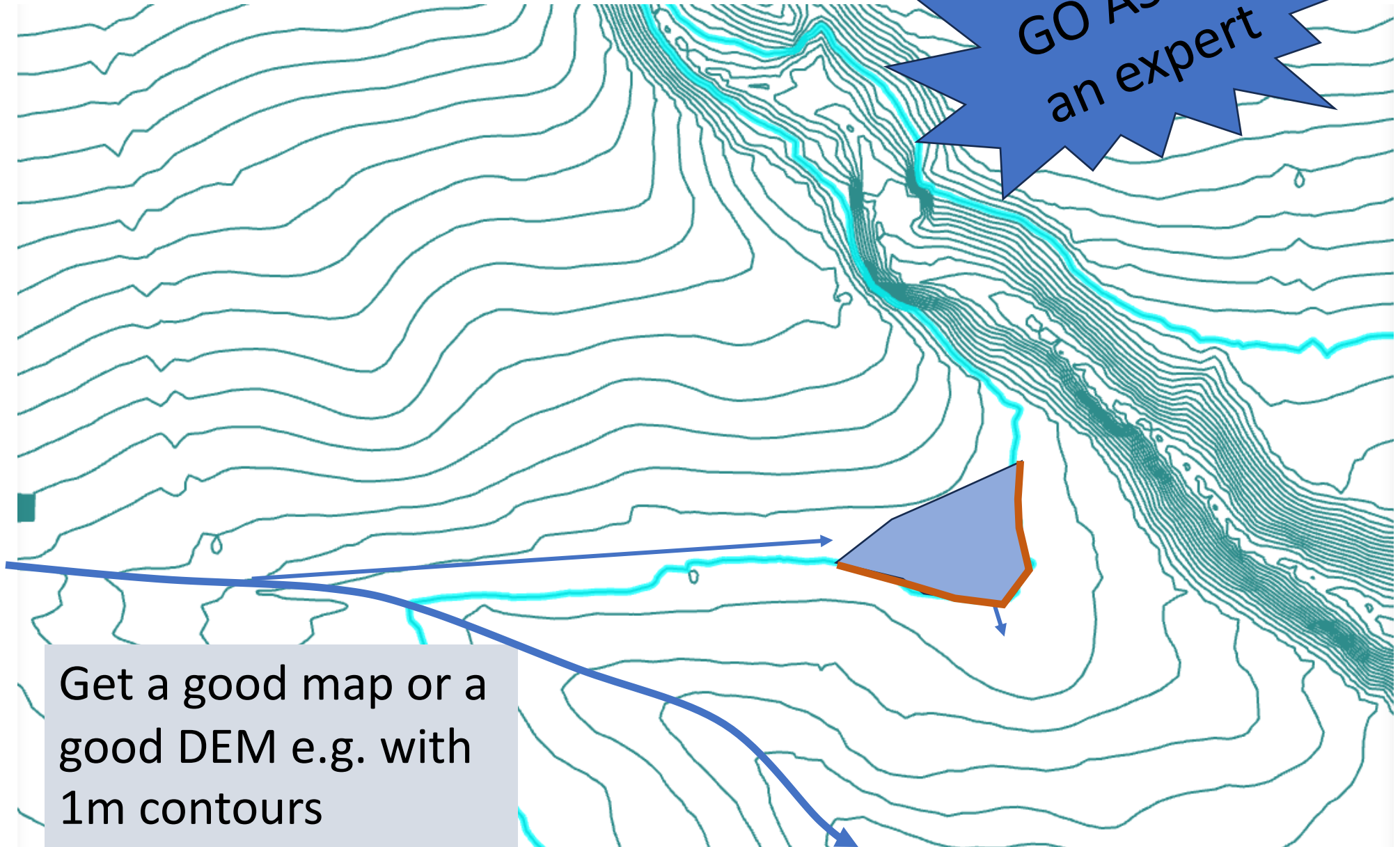
GO ASK an expert

- Eureka – This place is perfect!

Step 3 – how to draw off the correct amount of water? How much to drawoff is much more complex

- Draw off structure: either build up the bank or cut into the bank

Step 5. How big is a pond?



Get a good map or a good DEM e.g. with 1m contours

Add a 1m high bund. It will stretch to the next contour

Estimate area by measurement and shape, assume 50cm depth.

Measure tools
1800m^2 ~ 900m^3

Step 6: How strong are the structures for flow in and out?

Features must be strong!

Step 7: How much flow must leave the pond?

- Complex

GO ASK an expert

- My simple rule is … the peak outflow should be about half the rate of the peak inflow from the draw off structure

- Or have an adjustable draw off and fix it later. Adaptive engineering!

Conclusion

- Flood ponds are designed for flood flow primarily, but water quality and other benefits can be gained
- You will need help – go ask an expert
- There is plenty of capacity on farms for flow storage
- We need to learn together
- We need to sort out the funding model

The weather is changing now, and we must adapt