



Waterway Restoration Conference 2025

Saturday 26th April

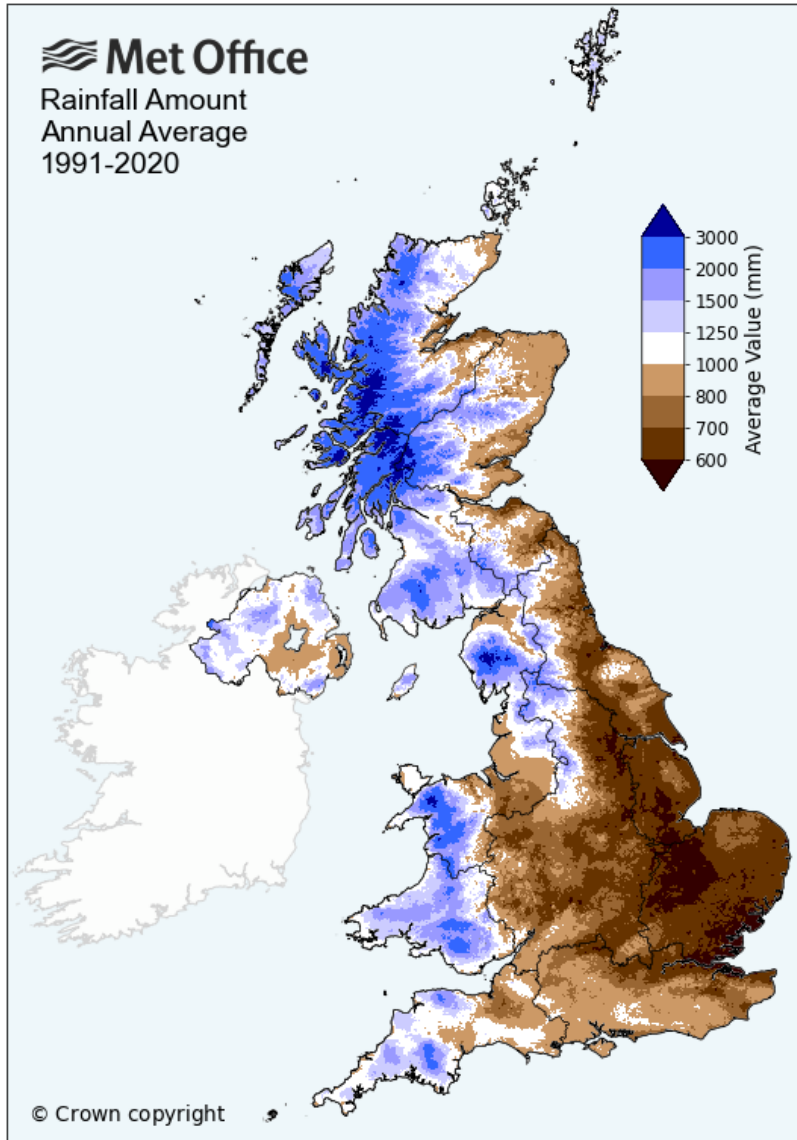
WATER TRANSFER Continuing the conversation

John Pomfret, IWA

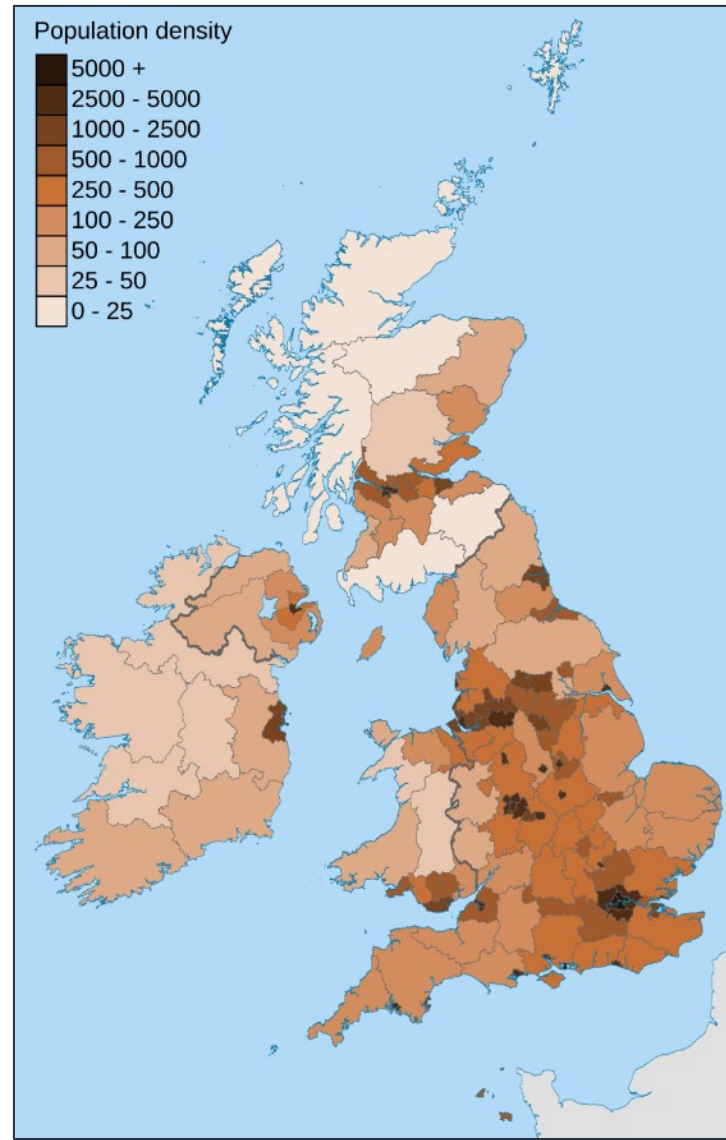
Location: Waterways Museum, Ellesmere Port

Background to water transfer in the UK

THE ISSUE



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- Greatest rainfall in the UK is in the west and north
- Greatest population density is in the generally drier areas
- These areas are running out of water
- How can we move water to where it is needed?

WE HAVE BEEN DOING THIS FOR A LONG TIME!

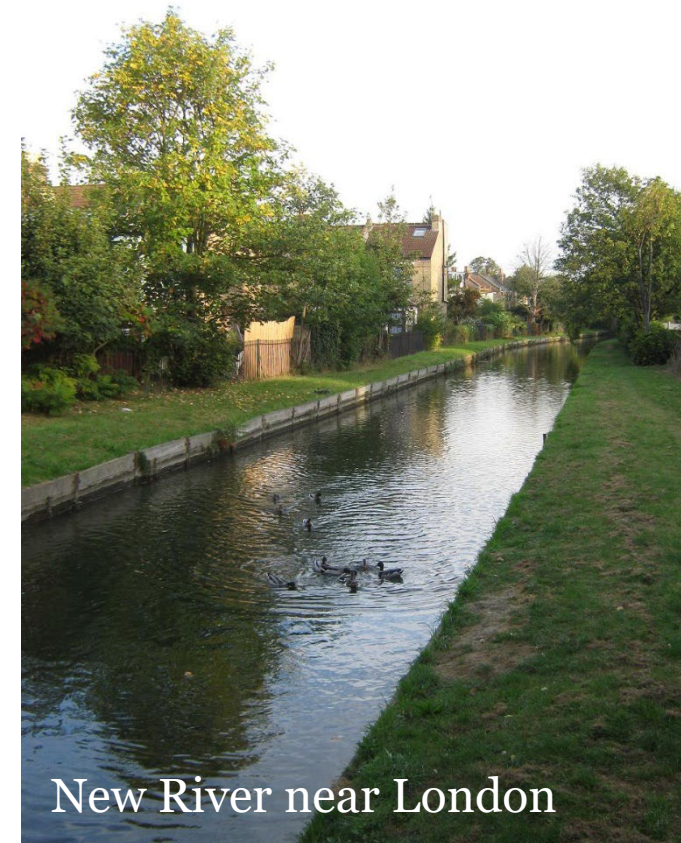
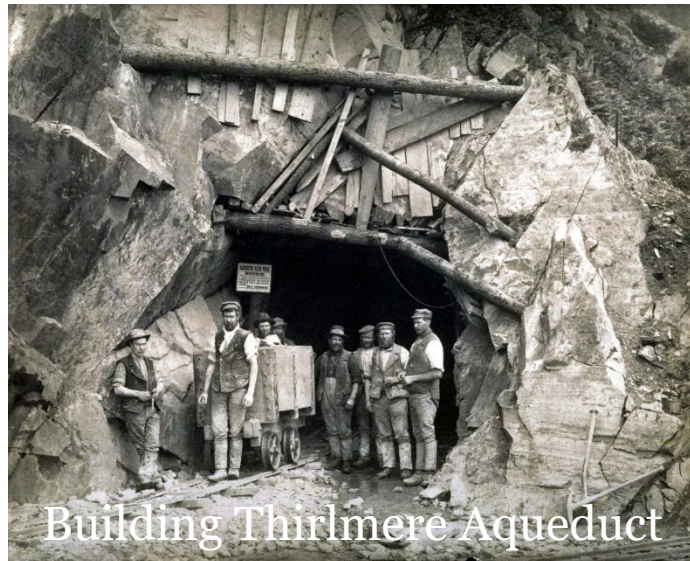
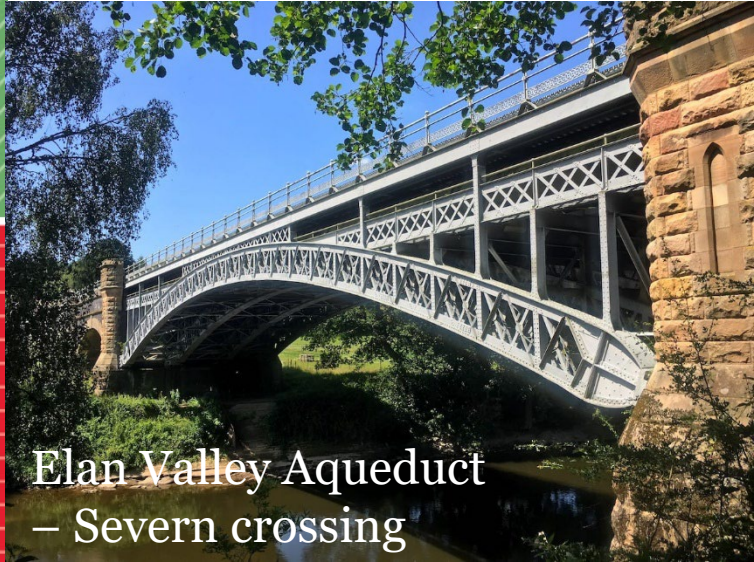
- Long-distance aqueducts have been around since Victorian times
- So, there is a lot of experience available, some published



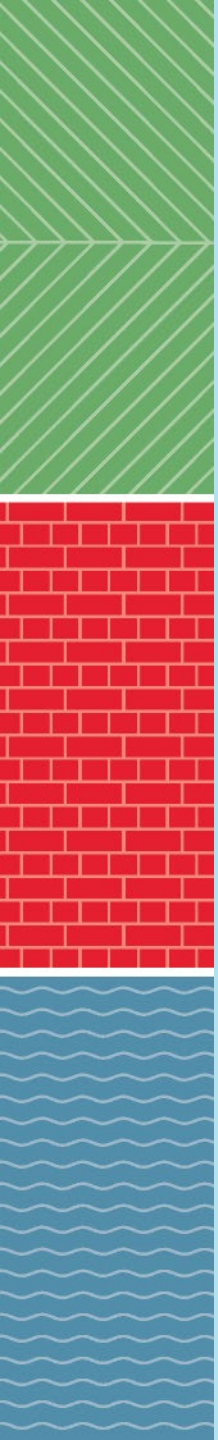
<i>Location</i>	<i>Date</i>	<i>Owner</i>	<i>Length</i>	<i>Capacity</i>	<i>Drive</i>	<i>Treatment</i>
Ware to Stoke Newington (New River)	1613	TW	>32 km	220 Ml/d	Gravity	Raw
Loch Katrine to Milngavie, Glasgow	1859	SW	42 km	110 Ml/d	Gravity	Raw
Thirlmere to Heaton Park, Manchester	1894	UU	154 km	250 Ml/d	Gravity	Screened
Nidd Reservoirs to Chellow Heights, Bradford	1899	YW	51 km	95 Ml/d	Gravity	Screened
Loch Katrine to Milngavie, Glasgow	1901	SW	38 km	120 Ml/d	Gravity	Raw
Haweswater to Heaton Park, Manchester	1955	UU	116 km	570 Ml/d	Gravity	Screened
Vyrnwy to Prescot, Liverpool	1892	UU	110 km	180 Ml/d	Gravity	Raw
Elan Valley to Frankley, Birmingham	1906	ST	126 km	345 Ml/d	Gravity	Raw
Catcleugh to Whittle Dene system	1906	NW	~72 km	205 Ml/d	Gravity	Raw
Ely-Ouse to Essex	1971	EA/NW	>200 km	455 Ml/d	Pumped	Raw
Trent to Witham to Ancholme	1974	EA	~75 km	180 Ml/d	Pumped	Raw
Riding Mill (Tyne) to Eggleston (Tees)	1979	NW	40 km	410 Ml/d	Pumped	Raw

WE HAVE BEEN DOING THIS FOR A LONG TIME!

- These aqueducts comprise tunnels, pipes and open channels



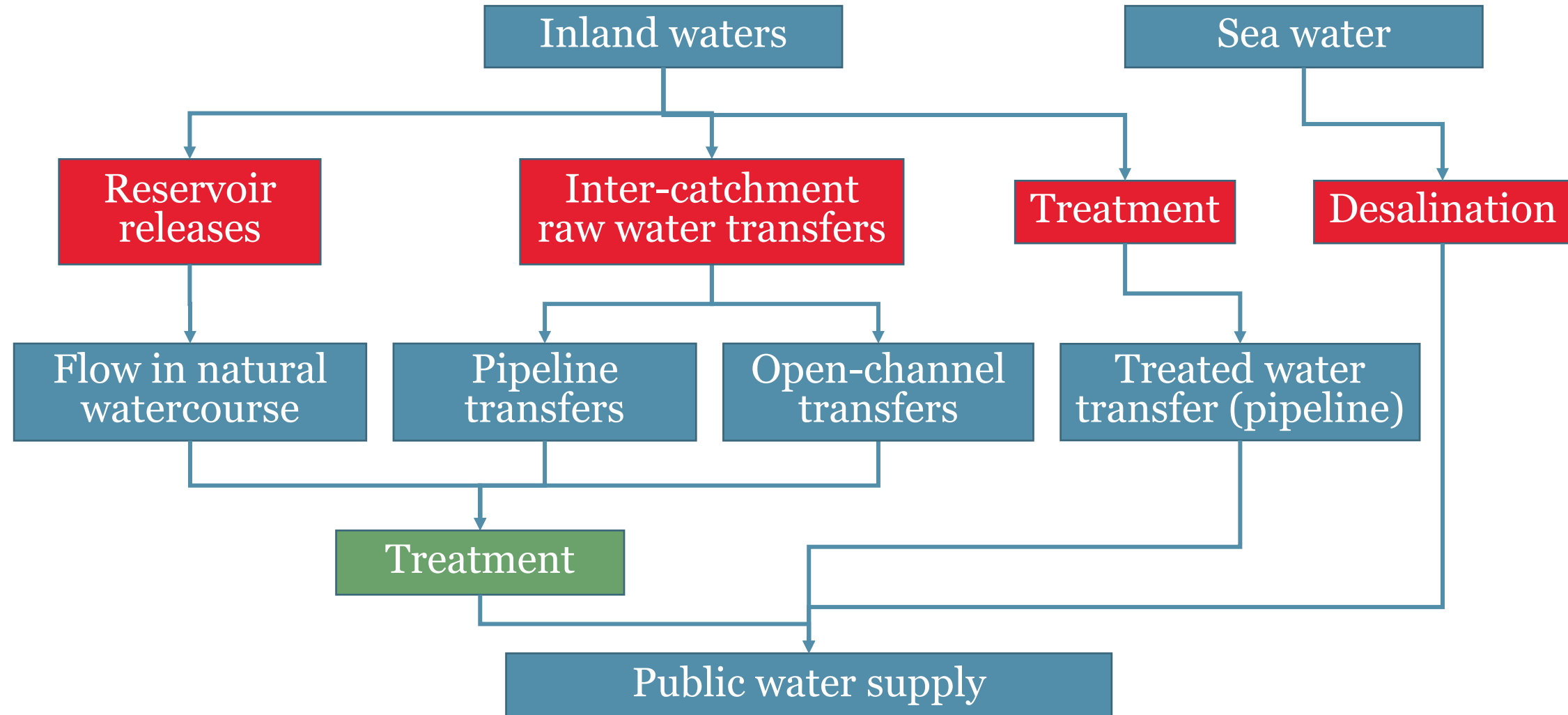
Nick Cooper, 2009. CC-BY-3.0



- Water transfer currently makes use of both navigable and formerly navigable waterways
- Comprehensive list is available

MANY OPTIONS

- Preference to stay within catchment for reasons of water quality and INNS but inter-catchment transfer is an option



*Why are we talking about it at
the Restoration Conference?*

WATER TRANSFER AND RESTORATION



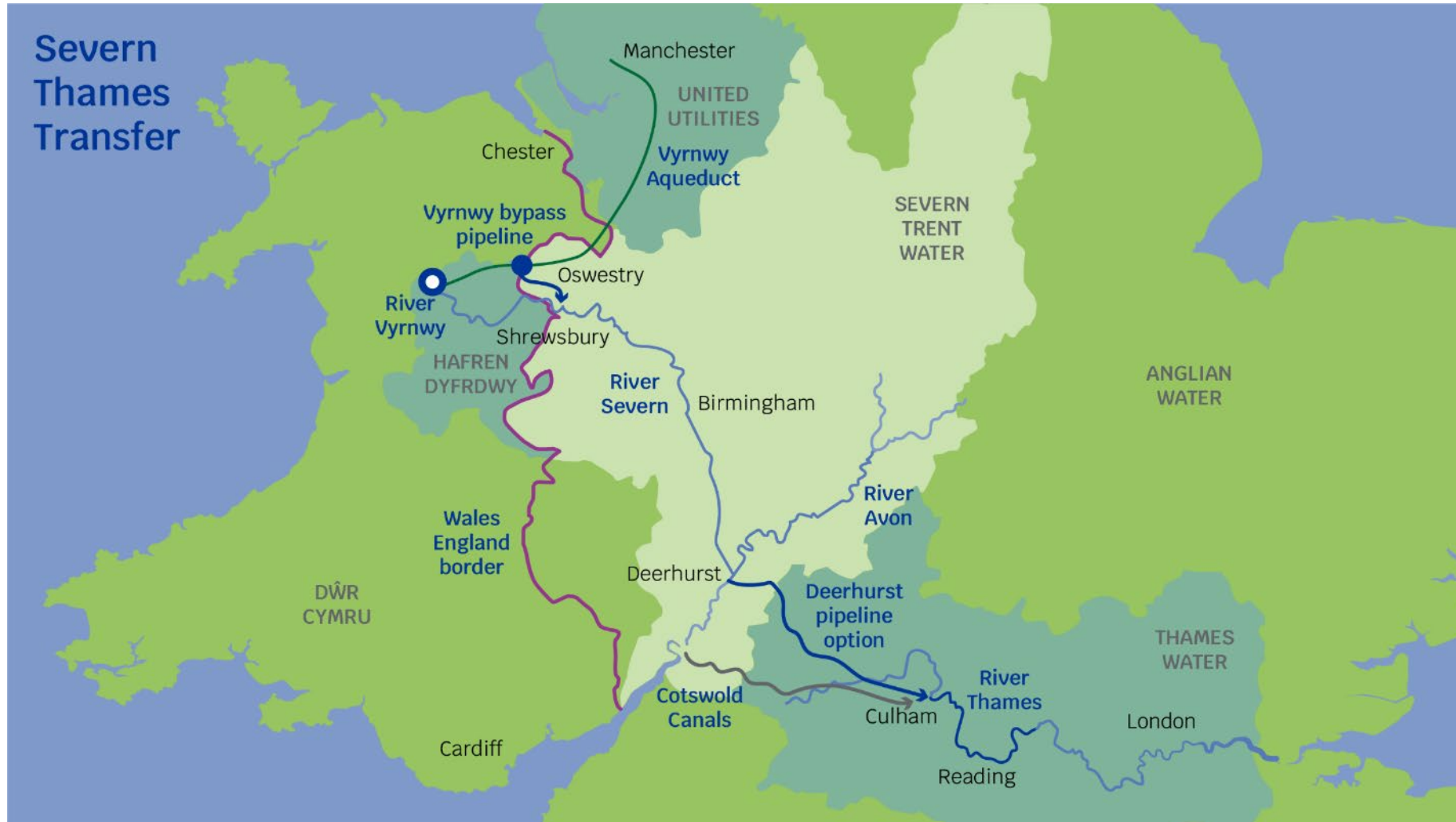
- Current water resource plans (SRO) are considering:
 - new reservoirs
 - water transfer
 - desalination
- Some transfer schemes are being proposed that use canals or navigable rivers
- Potential for restoration schemes to form part of the plan directly as transfer route or indirectly via BNG credits for example
- Potential for new waterways as part of water transfer schemes

However, remember -

- Transfers may be required during drought periods only
- These projects can have very long lead times (but so do many restorations!) – need to think ahead – possibly to future SROs

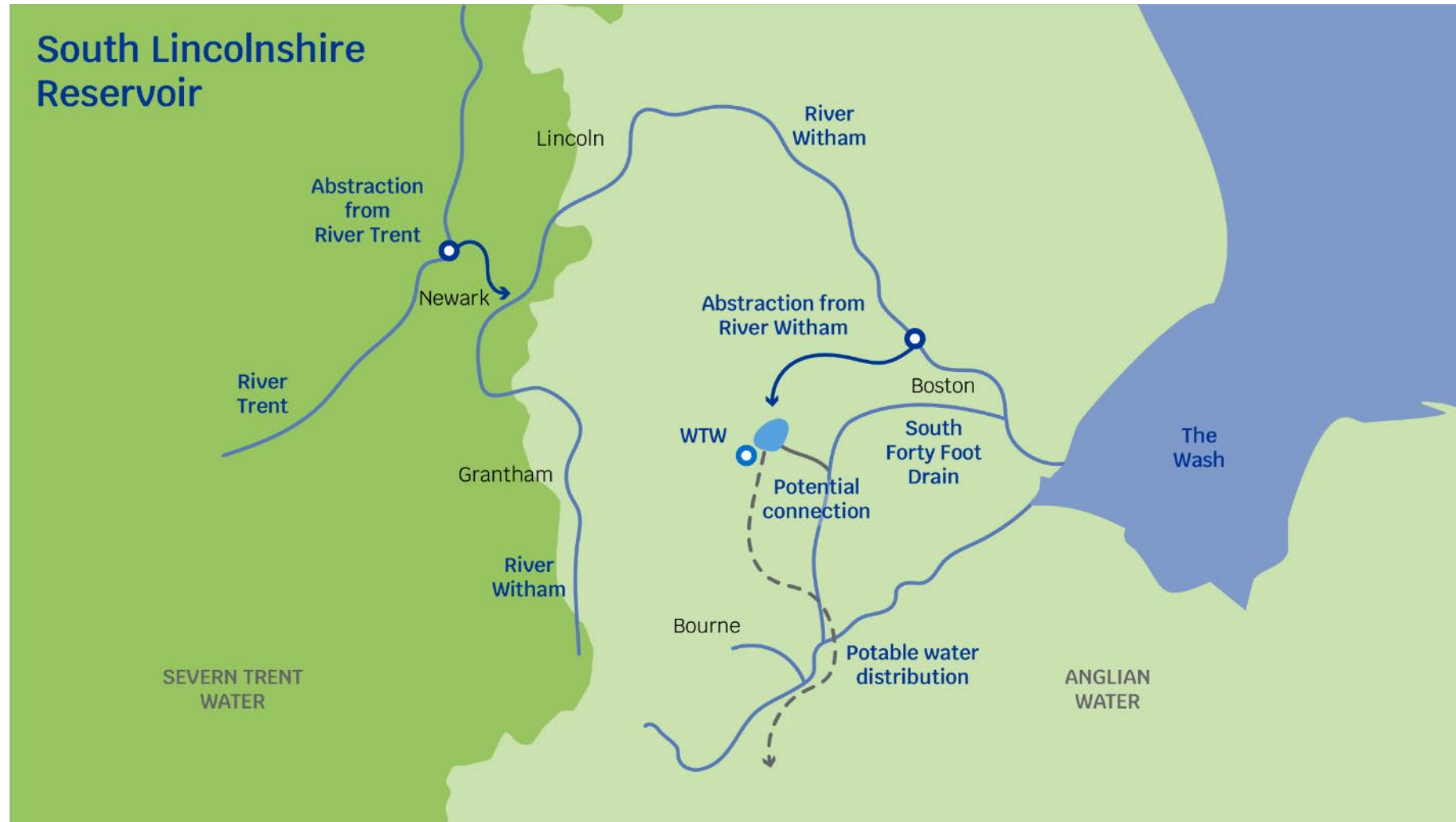
EXAMPLE RE ONGOING RESTORATION SCHEME

- Cotswold Canals could provide an option for water transfer from Severn to Thames



EXAMPLE RE POSSIBLE NEW WATERWAY

- Lincolnshire Reservoir proposals could help progress the Fens Waterways Link



EXAMPLE RE USE OF A NAVIGABLE CANAL

- Grand Union Canal Transfer –not a restoration but many aspects are relevant



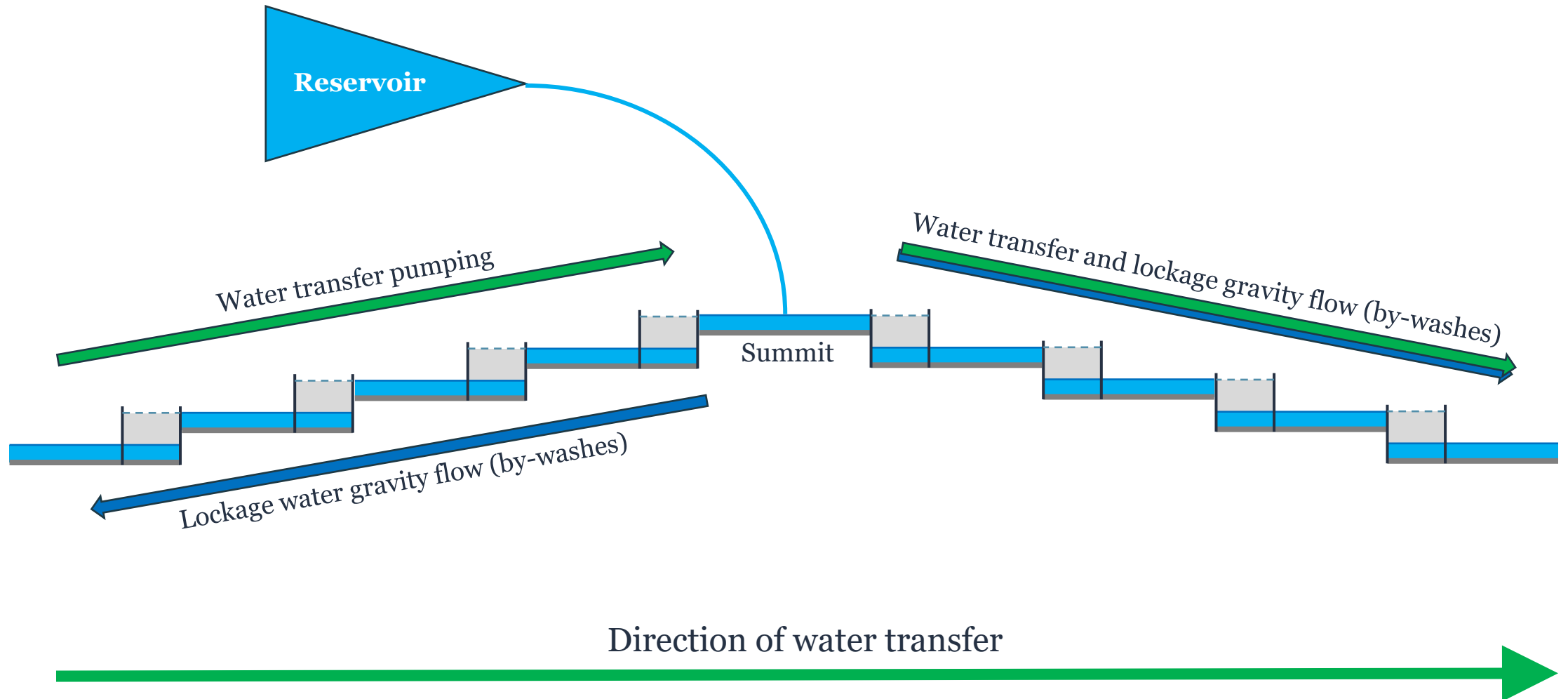
*Promoting your restoration
scheme for water transfer*

WHAT MIGHT YOU GET OUT OF IT?



- Possible contribution to capital cost of restoration?
 - Water company input may be limited to water transfer related aspects
- Assured water supply?
 - Continuous transfers (as Llangollen and G&S) may provide constant supply
 - Some transfer schemes may be for use in droughts only, so may not provide regular supply – but supply in droughts may still be very useful
 - For summit canal, need agreement to accommodate allowing water to flow back for use for lockage on ‘uphill’ side
 - Will maintenance of levels in canal reservoirs be included and what control rules will there be - who will have first call on this water?
- However, note that:
 - any water company financial inputs must be approved by OFWAT
 - raw water transfer schemes in England >80Ml/d between catchments or water undertakers’ areas are classed as NSIP and require DCO

WHAT MIGHT YOU GET OUT OF IT?



ADVANTAGES AND DISADVANTAGES



- What are the advantages of open channel inter-catchment transfer and what are the disadvantages compared with pipelines?

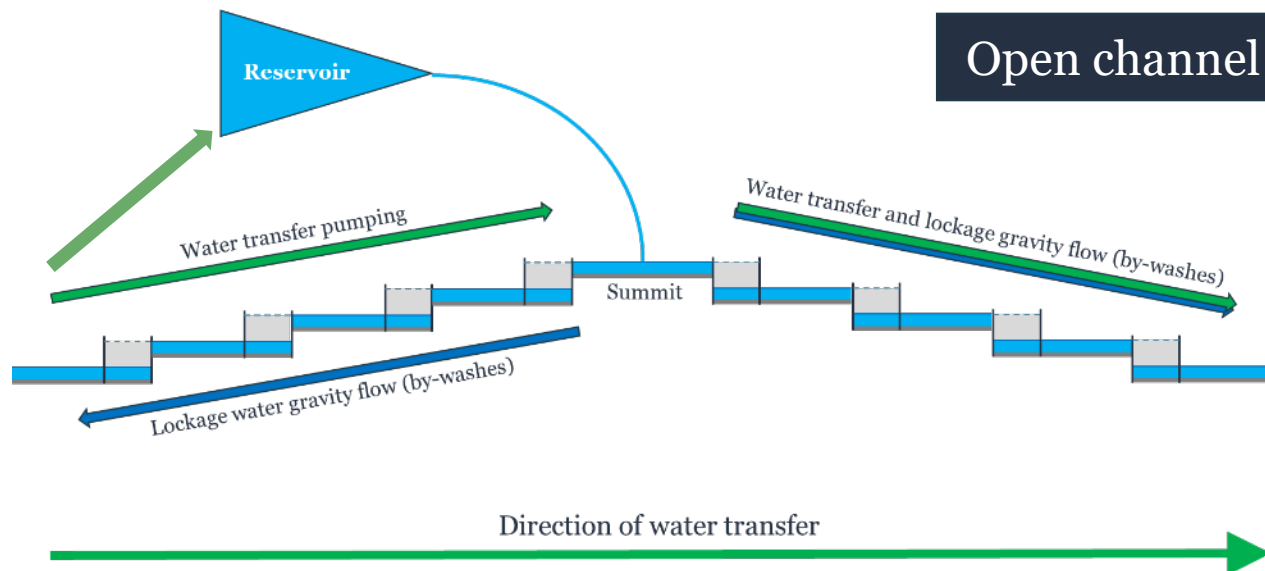
ADVANTAGES

- May be fewer landowners to negotiate with (existing open channel).
- Nature conservation (BNG) and amenity value - potential for multi-use (including navigation).
- Possible alleviation of low flow problems along transfer route.
- Potential alleviation of navigation restrictions during droughts where transfer uses a navigable waterway - subject to suitable operating rules.
- Potential additional source of income for navigation bodies.

DISADVANTAGES

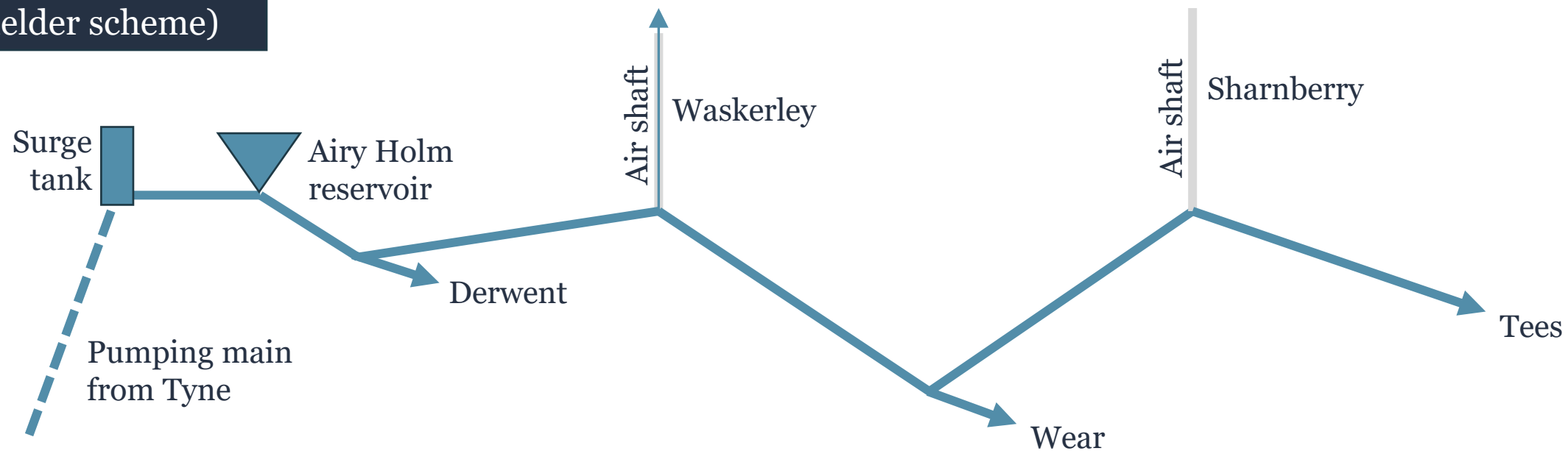
- Loss of head (no siphon effect) likely to lead to higher pumping costs over summits.
- Open to ingress of contaminants leading to increased water treatment costs.
- Potential adverse effects on navigation in canals, including excess currents, reduced headroom, reduced water depth, effects on moorings, changed flood risk and changes in water quality increasing weed growth.
- Potential adverse effects on heritage value of historic waterway structures and settings.

Open channel



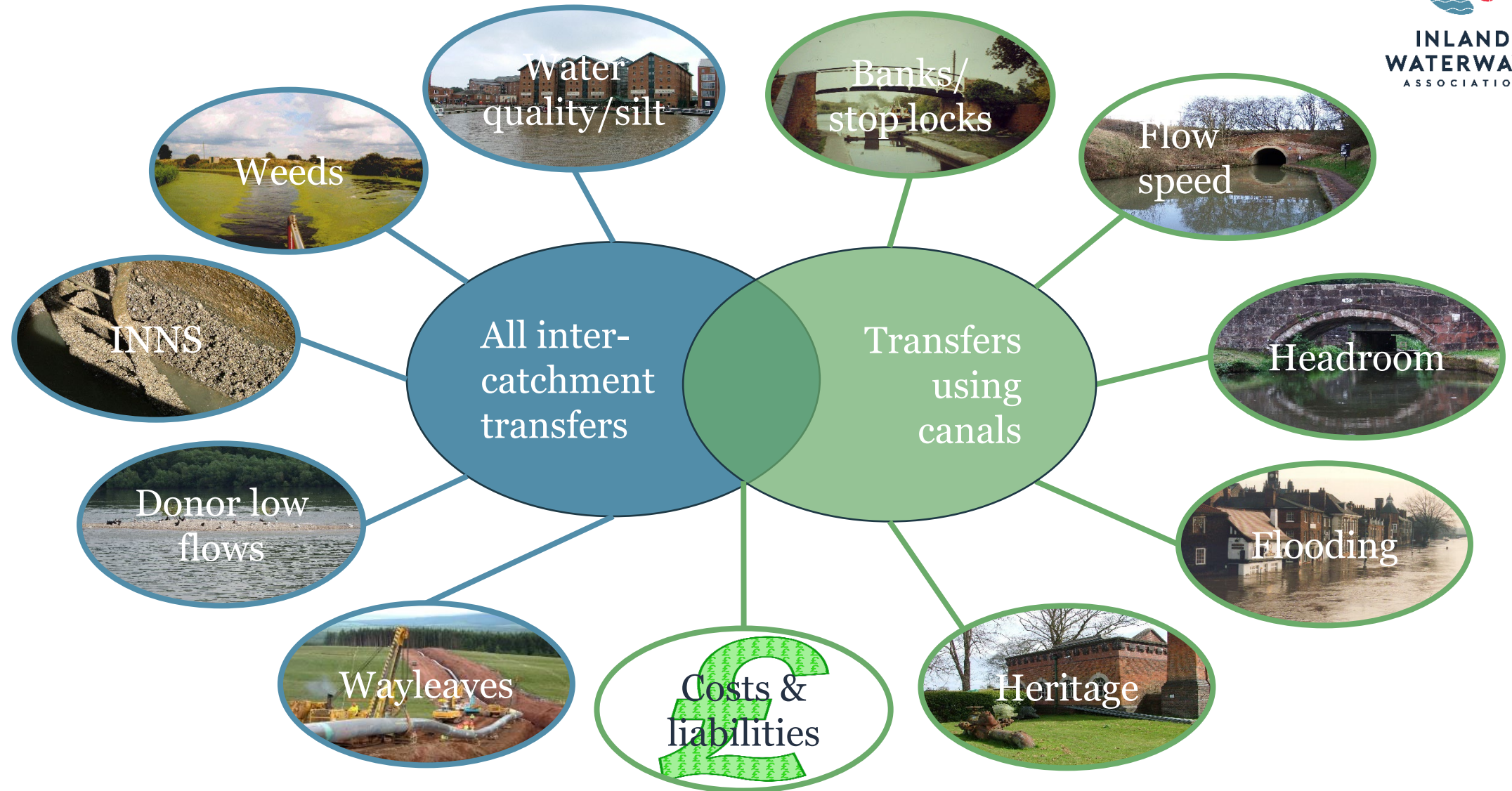
PUMPING COSTS

Pipe/tunnel (Kielder scheme)



Issues regarding water transfer

ISSUES REQUIRING CONSIDERATION/MITIGATION



WATER QUALITY



- Water is not simply H₂O (whatever a former Prime Minister might say!)
A water grid is not the same as an electricity grid!
- If pure water were put into supply, it would cause many problems
- Some components are desirable, others not
- Water quality is an essential consideration in any inter-catchment transfer (or treated water transfer - but that's not for today)
- WQ assessment needs to be specific to the water bodies involved
- Exposure to inputs (especially herbicides/pesticides) along an open-channel route is a significant concern
- So, what are we talking about here?

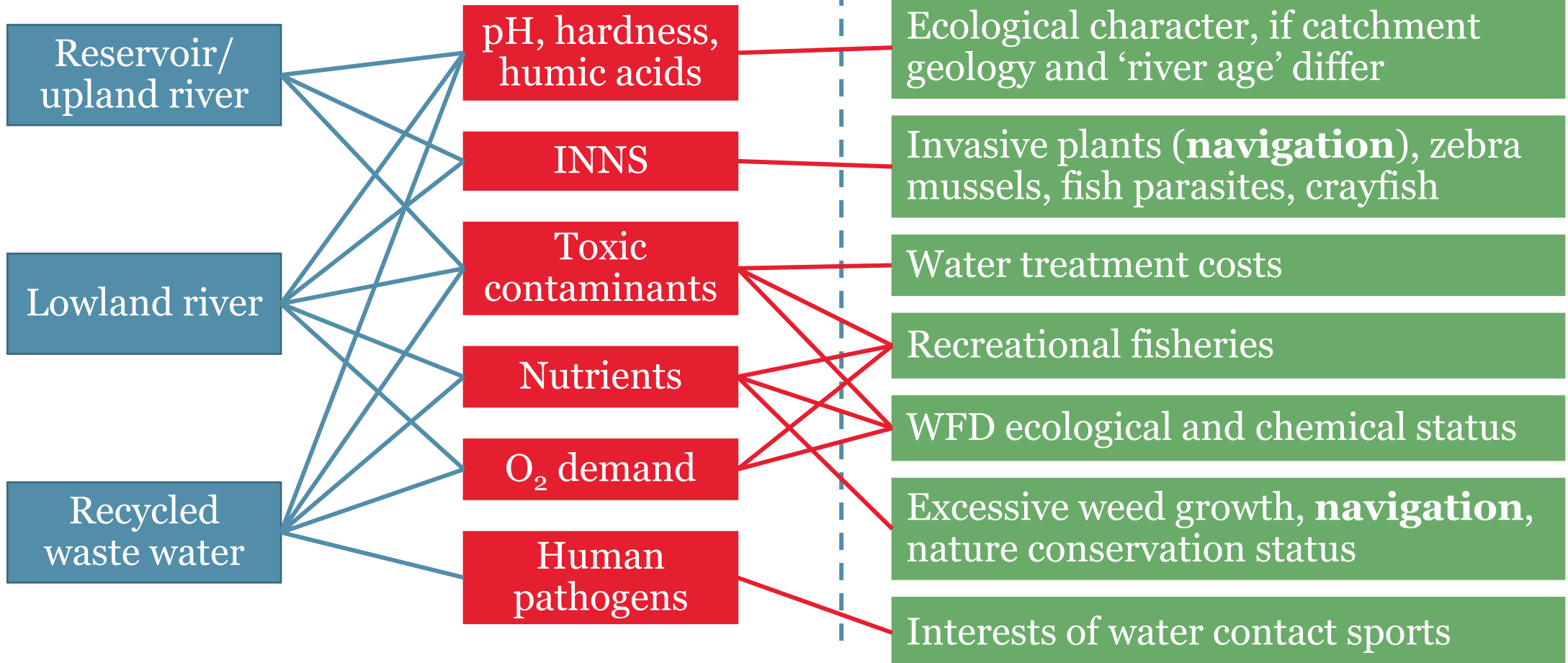
WATER QUALITY

- Only showing principal parameters of concern and main links

Source water

Parameter

Receiving water (including open channel transfer route)





Working to protect and restore

7,000 miles

of the country's rivers and canals