

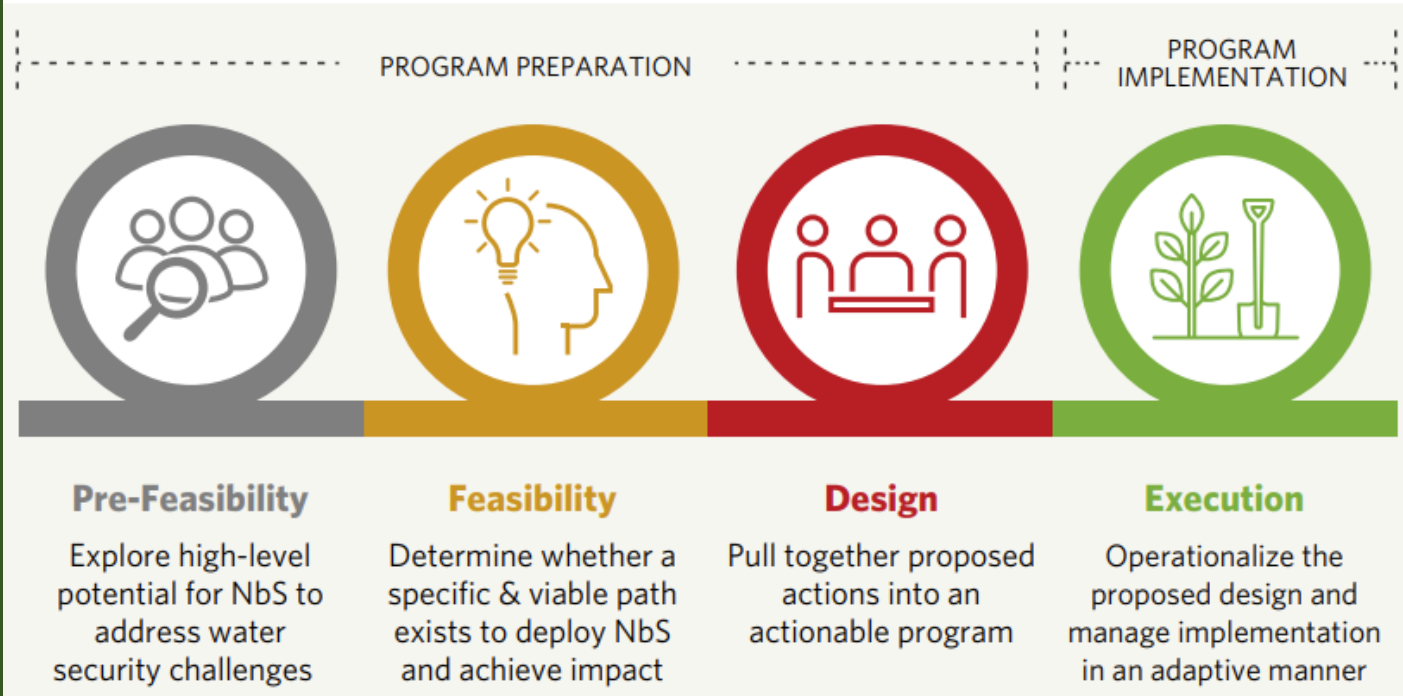
Mainstreaming NbS in water management

Rob Cunningham | April 2024

Is nature the answer?

Three key questions

1. What are the key *water security* issues we need to address?
2. Can *Nature-based Solutions* address them?
3. Is there a business case for *Watershed Investment*?



Water Security

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The availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an acceptable level of water-related risks to people, environments and economies.

Grey and Sadoff (2007)

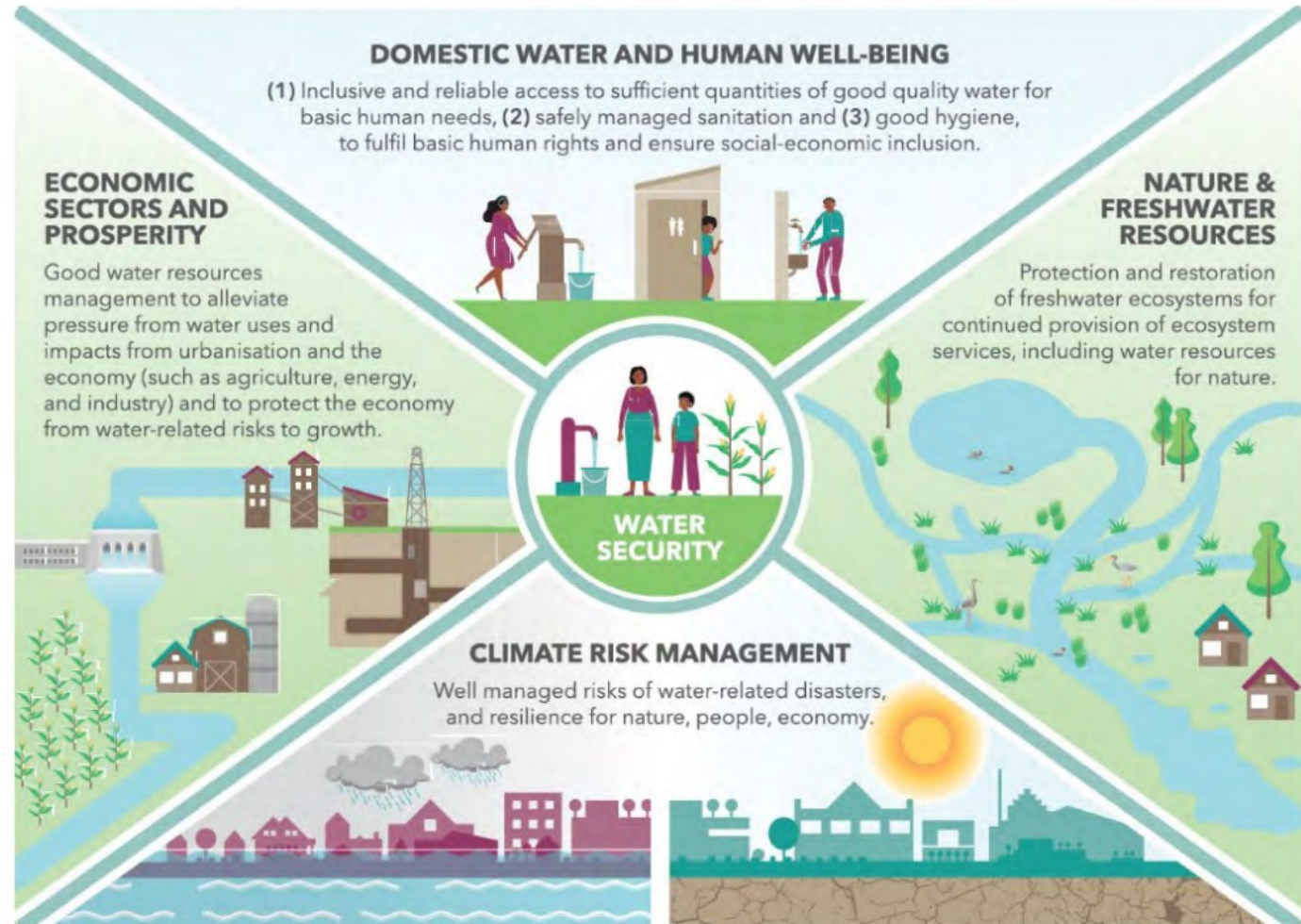


FIGURE 3. Diagram of Water Security (The Resilient Water Accelerator 2021). Societies can enjoy water security when they successfully manage their water resources and services to meet the needs of people and ecosystems over the long-term.

Nature-based Solutions

“

Actions to protect, sustainably manage and restore natural or modified ecosystems that address water security challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits.

Tremolet et al, 2019

WATER SECURITY CHALLENGE	WATER AVAILABILITY		DISASTER RISK	WATER QUALITY		POTENTIAL FOR OTHER BENEFITS
	Ecosystem benefit	Dry season flows	Groundwater recharge	Flood risk	Erosion & sediment	
Protection						
1. Targeted habitat protection	✓	✓	✓✓	✓✓	✓	
Restoration						
2. Revegetation	✓	✓	✓✓	✓✓	✓	
3. Riparian restoration	✓	✓	✓	✓✓	✓✓	
4. Wetlands restoration	✓	✓	✓✓	✓	✓✓	
5. Floodplain restoration	✓	✓	✓✓	✓✓	✓	
Management						
6. Agricultural Best Management Practices (BMPs)		✓		✓✓	✓✓	
7. Ranching BMPs	✓	✓		✓	✓	
8. Forestry BMPs	✓			✓	✓	
9. Fire Management			✓✓	✓✓	✓	
Created Habitats						
10. Artificial wetlands	✓	✓	✓	✓	✓✓	
11. Sustainable Urban Drainage Systems (SuDS)	✓✓	✓	✓✓	✓	✓✓	

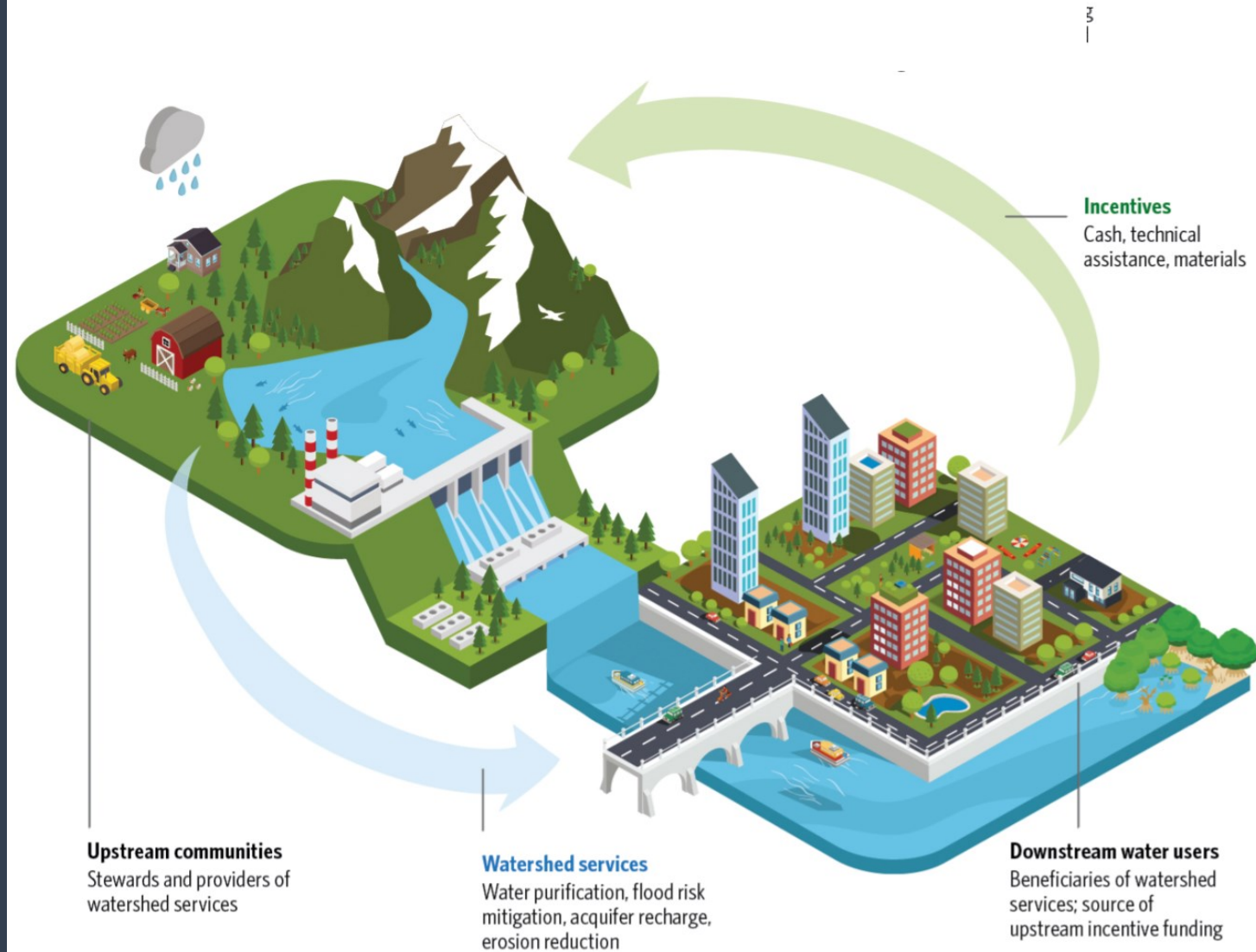
LEGEND	LOW	MEDIUM	HIGH
Magnitude of benefit			
Depth of evidence		✓	✓✓
Potential for multiple other benefits			

FIGURE 10. Summary table adapted from NbS Option Factsheets Deep Dive comparing typical water security benefits addressed and potential for co-benefits.

Watershed investment programs

The Water Fund Mechanism

Water funds are **collective action governance platforms** that bring together different water users – usually utilities, businesses, agriculture and local government – **to invest in ecosystem protection and upstream communities** within the catchments they depend on.



Case study:- The Norfolk Water Fund



Key characteristics

- Dominated by arable agriculture
- Low lying Internationally significant chalk rivers and lowland wetlands



The challenges...

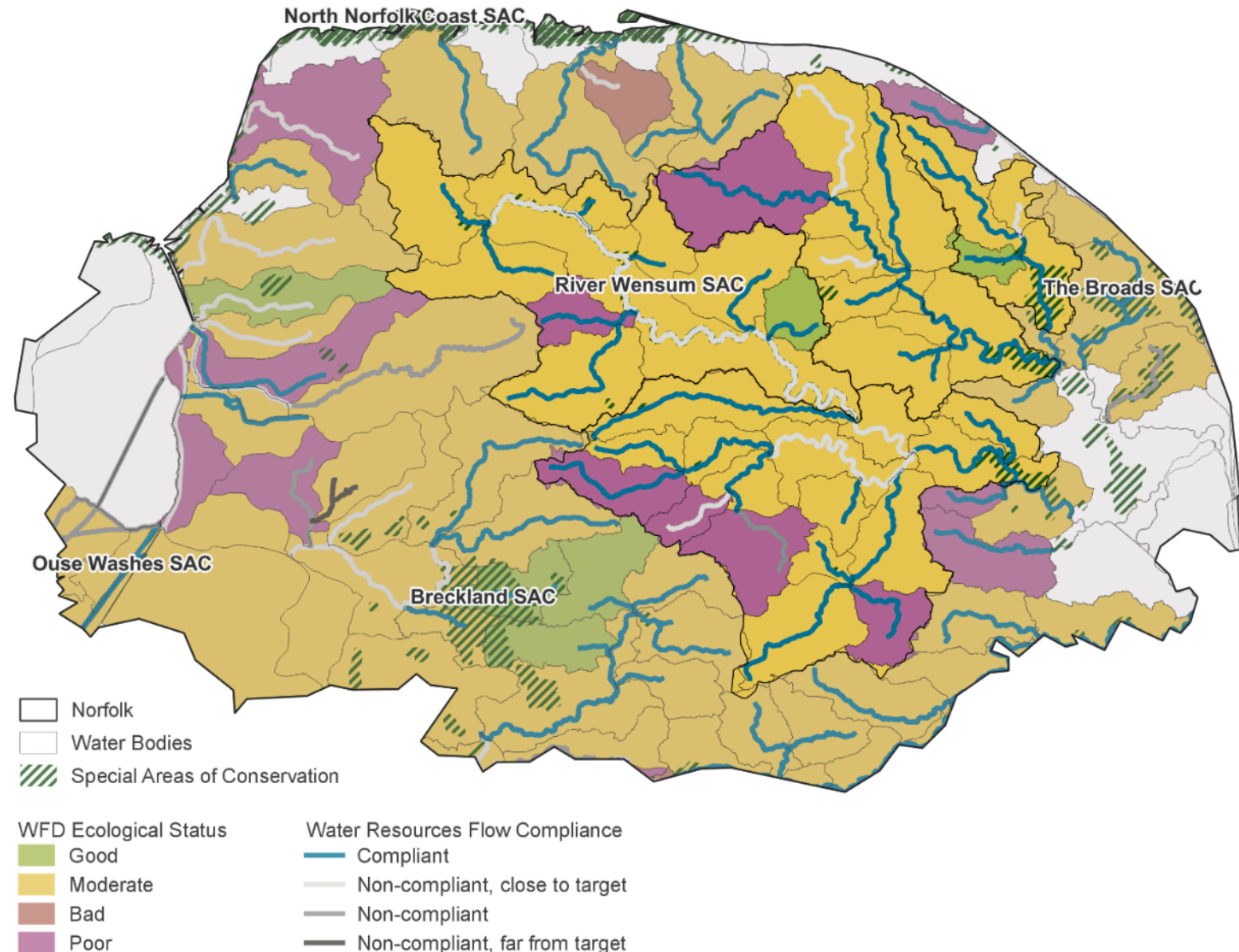
Key challenges include:

Water Quality

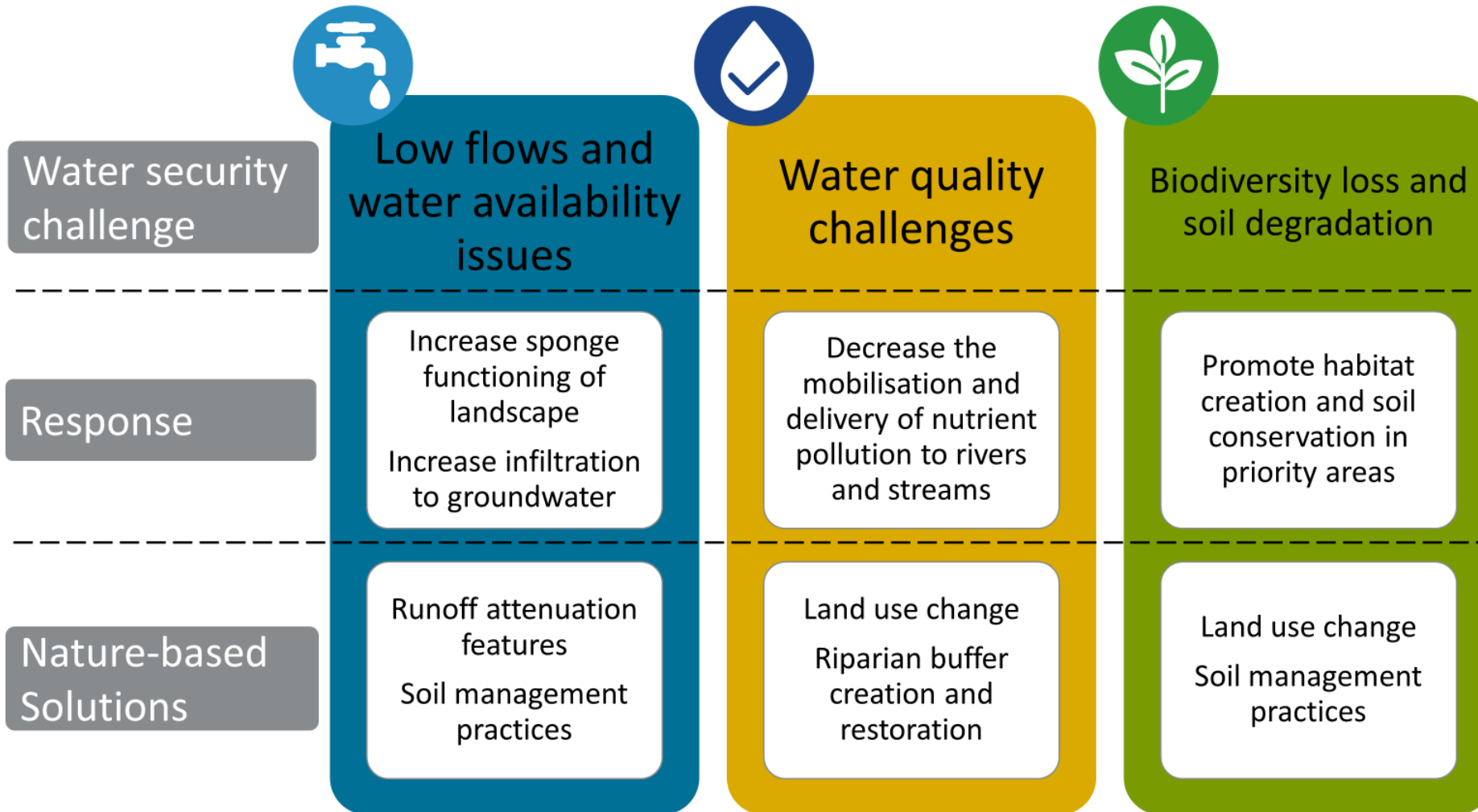
- Many waterbodies failing **'good ecological status'** under **Water Framework Directive** (or stricter targets)
- **Nutrient Neutrality** – stalled growth and development

Water Quantity

- **Environmental risk** – low flows and impact to ecology
- **Water availability to abstractors** (e.g. PWS, irrigators) – less water to abstract, temporary drought restrictions, licence capping



Modelling NbS as a solution to priority issues in Norfolk



Runoff Attenuation Features



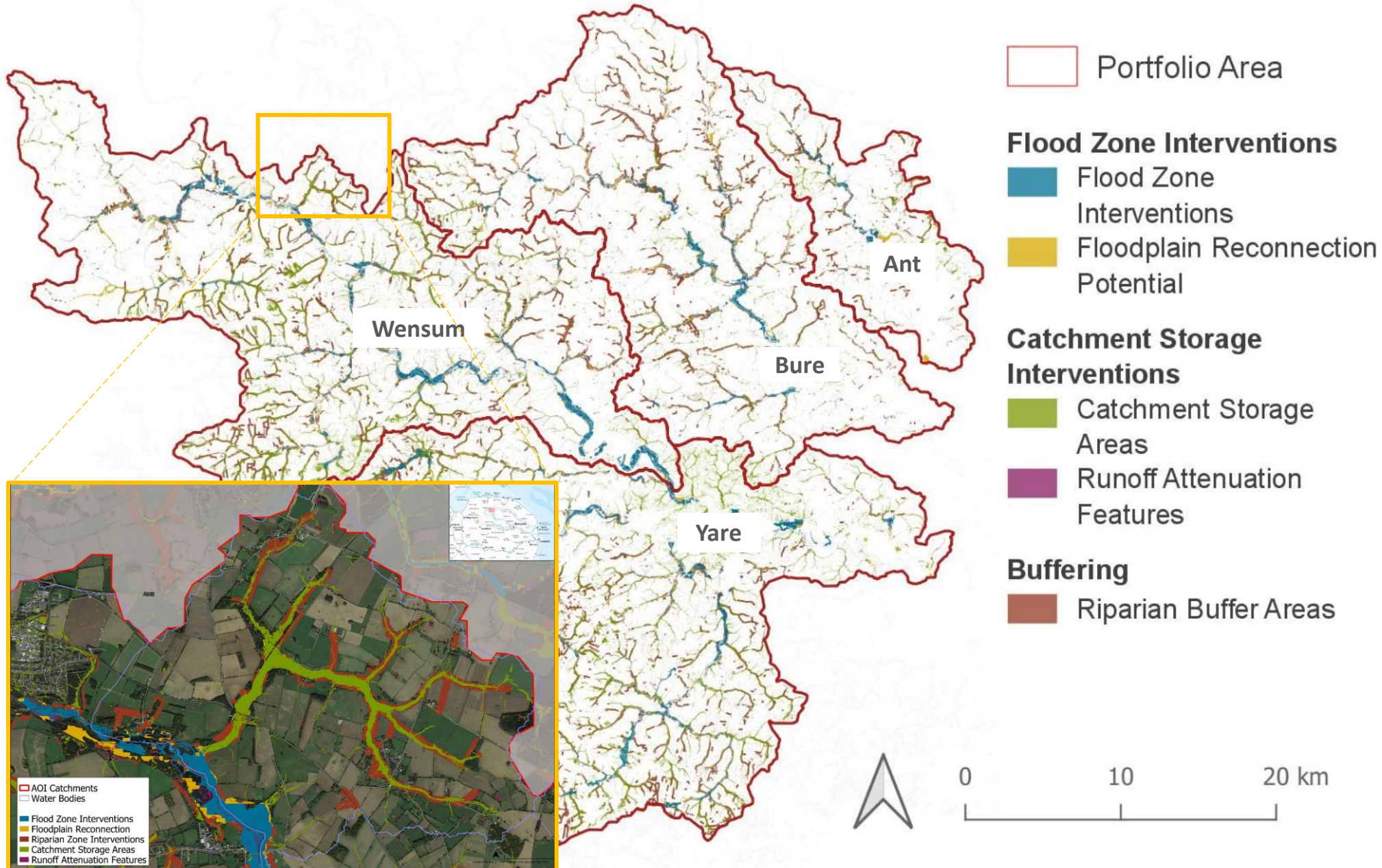
Riparian Zone Restoration



Soil Management



Where will nature have the greatest impact?



Modelling options for maximum impact

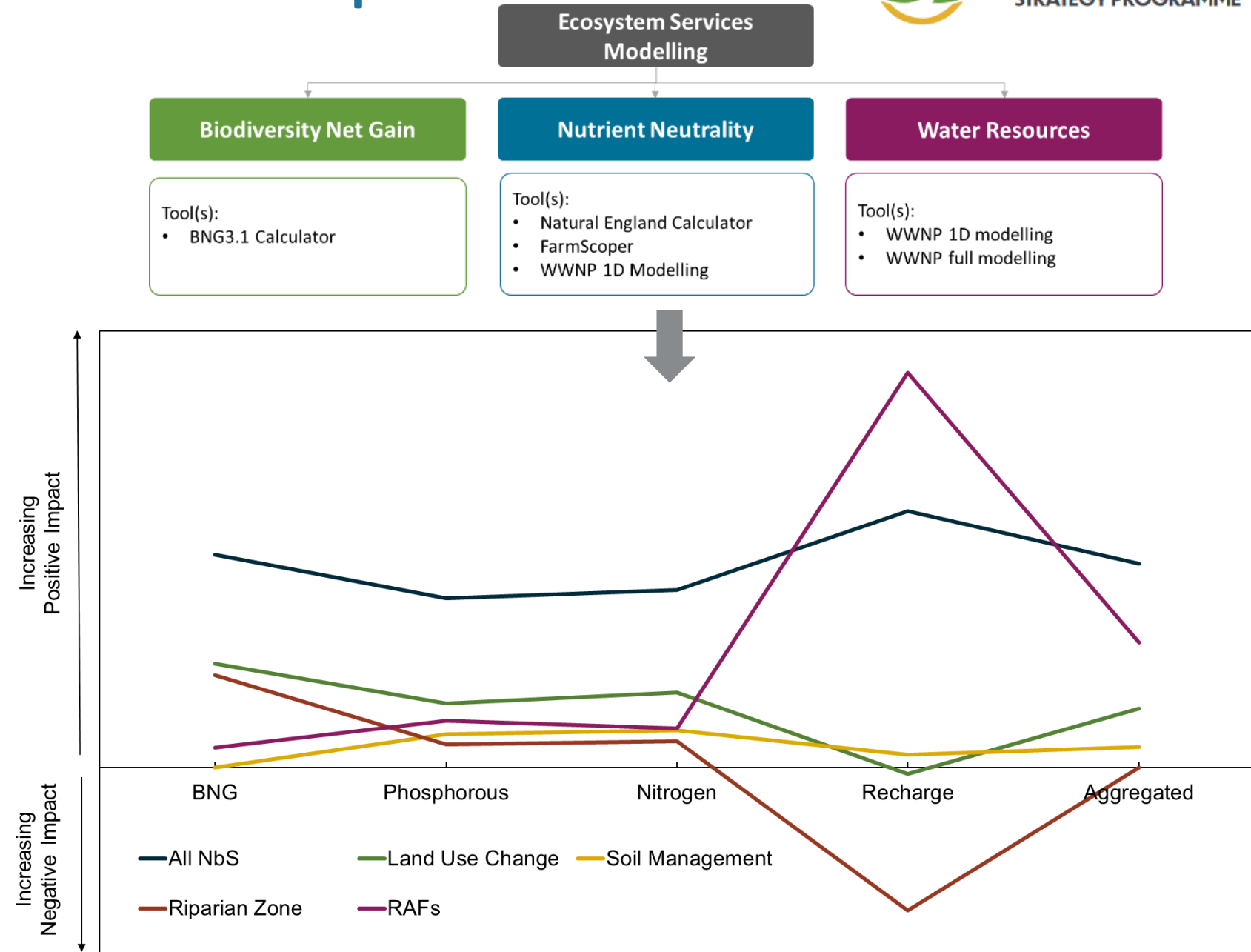
Key messages

Trade offs:

- Trade-offs exist between the ecosystem services delivered by different portfolios of NbS
- Maximising delivery of multiple benefits requires a **mixed portfolio of NbS**

Scaling:

- Linear relationships exist between delivery of NbS and outcomes



Our approach to assessing the economic opportunity

Economic and financial analyses to inform decision makers and potential funders

Economic analysis

Costs

Negative impacts related to the implementation of NbS, including **potential losses of revenues by landowners** in case of transition from arable land to other uses.

Benefits

To actors in relevant sectors, the general public and the environment:

- Reduction in nutrient pollution.
- Increase in water availability
- Climate regulation and improved air-quality
- Unlocking housing development.

Financial analysis

Costs

Costs of **designing, managing, implementing and monitoring** the impact of a portfolio of NbS.

Supported by project developers.

Revenues

- Sale of **Nutrient Neutrality** phosphorus and nitrogen offsets.
- Sale of **Biodiversity Net Gains** units.

Collected by landowners and shared with project developers to cover financial costs.

The economic case of the Norfolk Water Fund



A clear case for nature-based solutions...

Each £1 invested in nature yields £6.7 in benefits

3.7 million m³/year

More water in the landscape
through infiltration

£10.8 million

Worth of CO₂ capture and removal
of micro-particles improving
climate and air quality

25,800 hectares benefiting

from NbS interventions
Improving habitats for Norfolk's
wildlife

273 kgs of phosphorus

and

13,794 kgs of nitrogen

offset per year, improving river
water quality

1,721 houses unlocked

Worth £158 million

Plus a significant opportunity to create jobs, generate social co-benefits, and multiple other benefits
[not included in the business case]

What next for Norfolk?

- The Norfolk Water Fund Business Plan has gone from pre-feasibility through to design.
- “Execution” requires constitution of entity to run the programme and funding
- Next 18 months will be spent developing governance and piloting NbS.
- Programme is already extending to other chalk catchments under water stress



What next for TNC in Europe? - Croatia

- TNC's engagement in Croatia / Balkans has focussed on protecting free-flowing rivers.
- European Environment Bank sponsoring screening study to look at potential for NbS in Croatia.
- Issues with inadequate WW treatment in small settlements, floods and droughts.
- Significant work to do to build knowledge and capacity.



Thanks for listening

Read the full Norfolk Water Fund here



Access the Water Fund Toolkit here



Learn how the Nature 4 Water Facility can help your programme here



The Norfolk Water Strategy Programmes is supported by

