

Why Wetlands?



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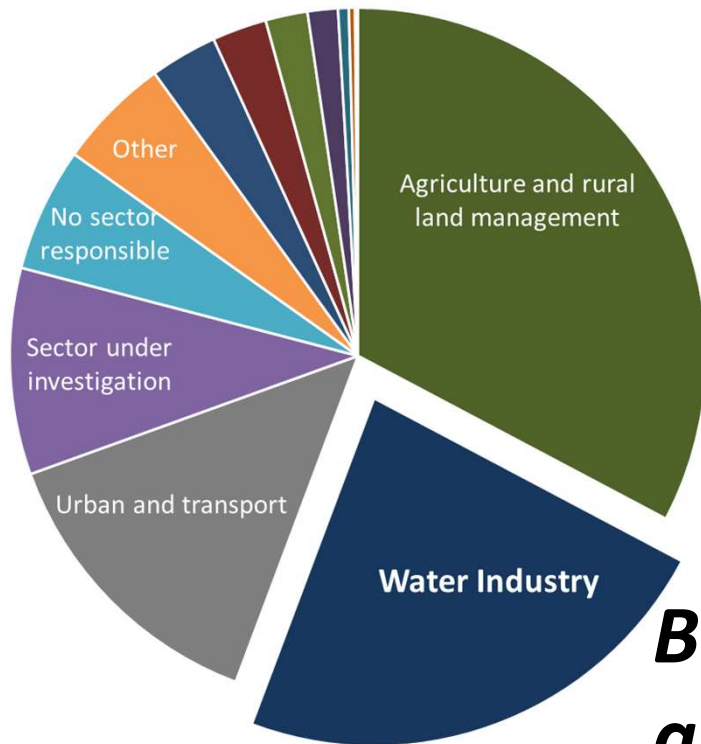
Operations Director Norfolk Rivers Trust

2nd February 2021

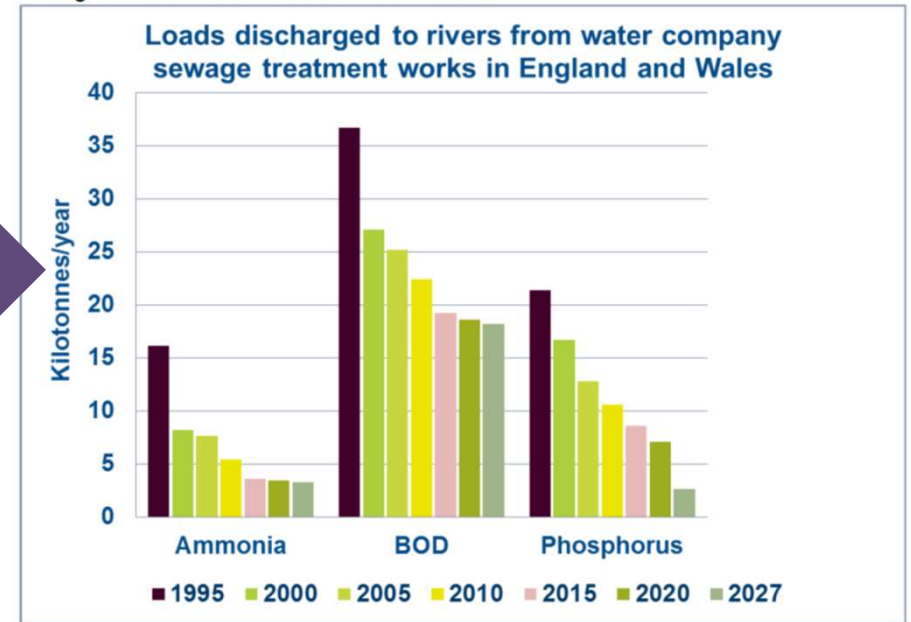


Why Wetlands?

We've come a long way



WFD RNAG (2015)



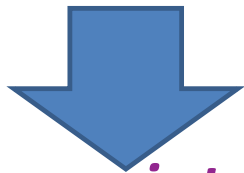
But the WFD tells us we have much further to go.

Business as usual will be carbon intensive and hugely expensive

Success is more than meeting targets

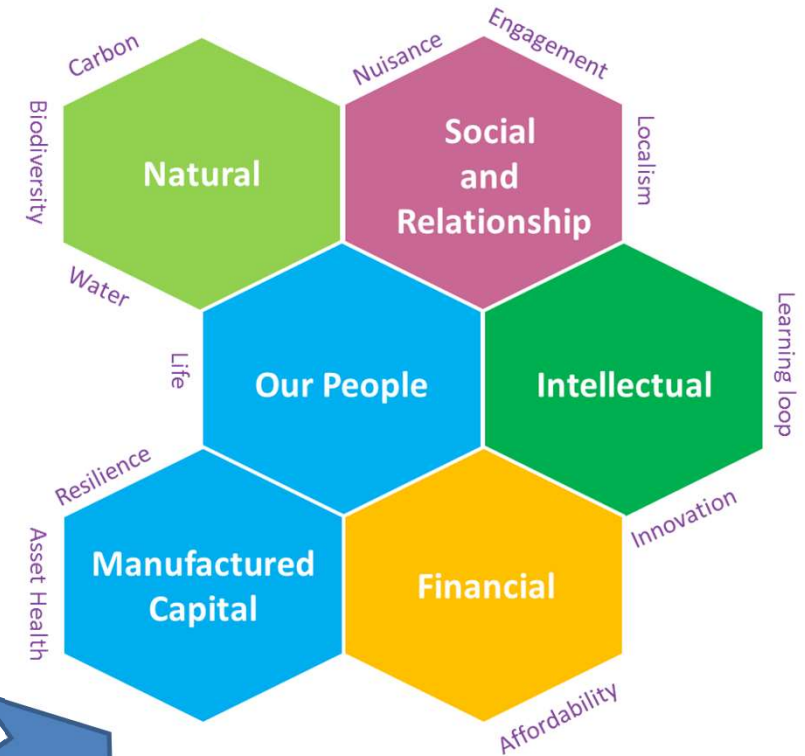
What it means to be a water company is changing:

- Customer expectations
- Regulatory expectations
- Considering stakeholder's views
- Green Finance /
- Business operating model
- The need for transparency



Our Purpose is to bring environmental and social prosperity to the region we serve through our commitment to Love Every Drop.

CR1



Slide 3

CR1

Cunningham Rob, 01/02/2021

Why Ingoldisthorpe?

- Tight new ammonia standard that went to TaL.
- An opportunity to deliver natural capital beyond improved water quality.
- A partnership with Norfolk Rivers Trust looking for wetland opportunities.
- Buy in at AW all the way from local staff through to CEO.
- Environment Agency support for innovative permitting arrangements

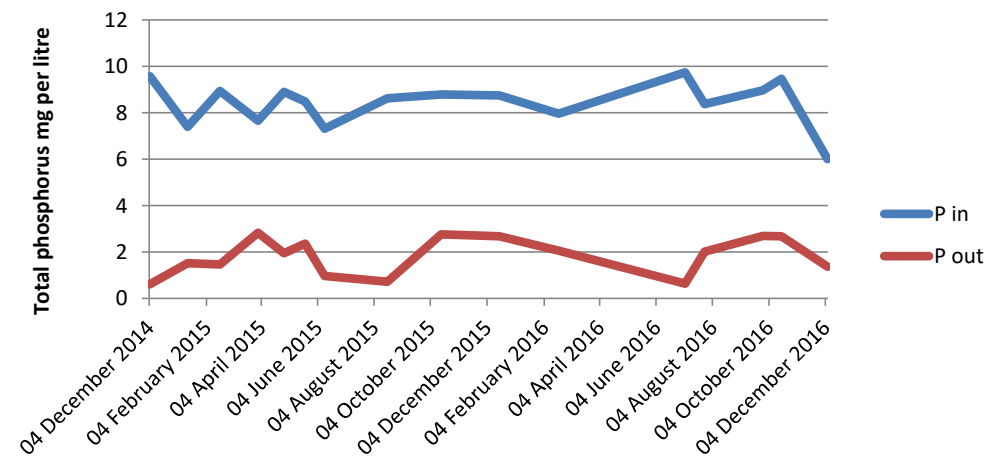




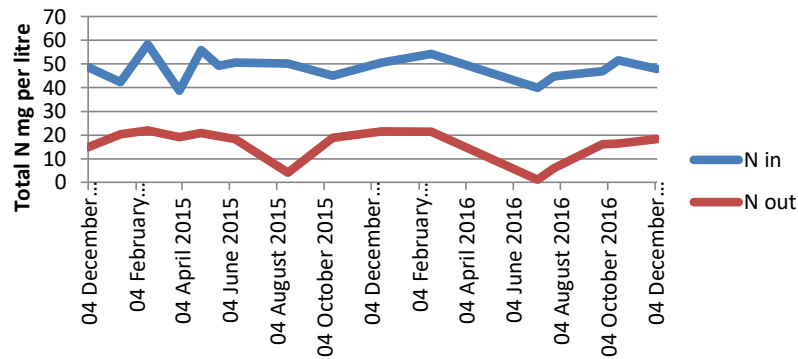




Phosphorus reduction through Northrepps wetland

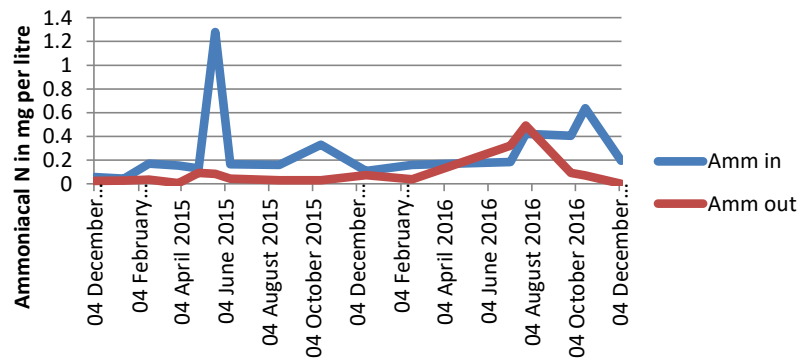


Nitrogen reduction through Northrepps wetland



- Cooper *et al* (2020) Assessing the environmental and economic efficacy of two integrated constructed wetlands at mitigating eutrophication risk from sewage effluent. Water and Environment Journal **0** 1 – 10

Ammonia reduction through Northrepps wetland



- van Biervliet *et al* (2020) Can an integrated constructed wetland in Norfolk reduce nutrient concentrations and promote *in situ* bird species richness? Wetlands

Table 2 Summary of the mean nitrogen, phosphorus and carbon loads at the inlet and outlet of the River Ingol and River Mun ICWs between February and September 2019

Parameter	River Ingol			River Mun		
	Inlet (kg/day)	Outlet (kg/day)	Change (%)	Inlet (kg/day)	Outlet (kg/day)	Change (%)
Discharge (m ³ /day)	301.1	128.7	−57.3	160.0	187.1	+16.9
Nitrate-N	8.55	2.42	−71.7	9.71	4.30	−55.7
Phosphate-P	0.61	0.19	−68.9	1.38	0.58	−58.0
DOC	1.93	0.90	−53.3	–	–	–
Total Carbon	8.88	5.02	−43.5	–	–	–

Change refers to the percentage difference between wetland inlet and outlet loads.

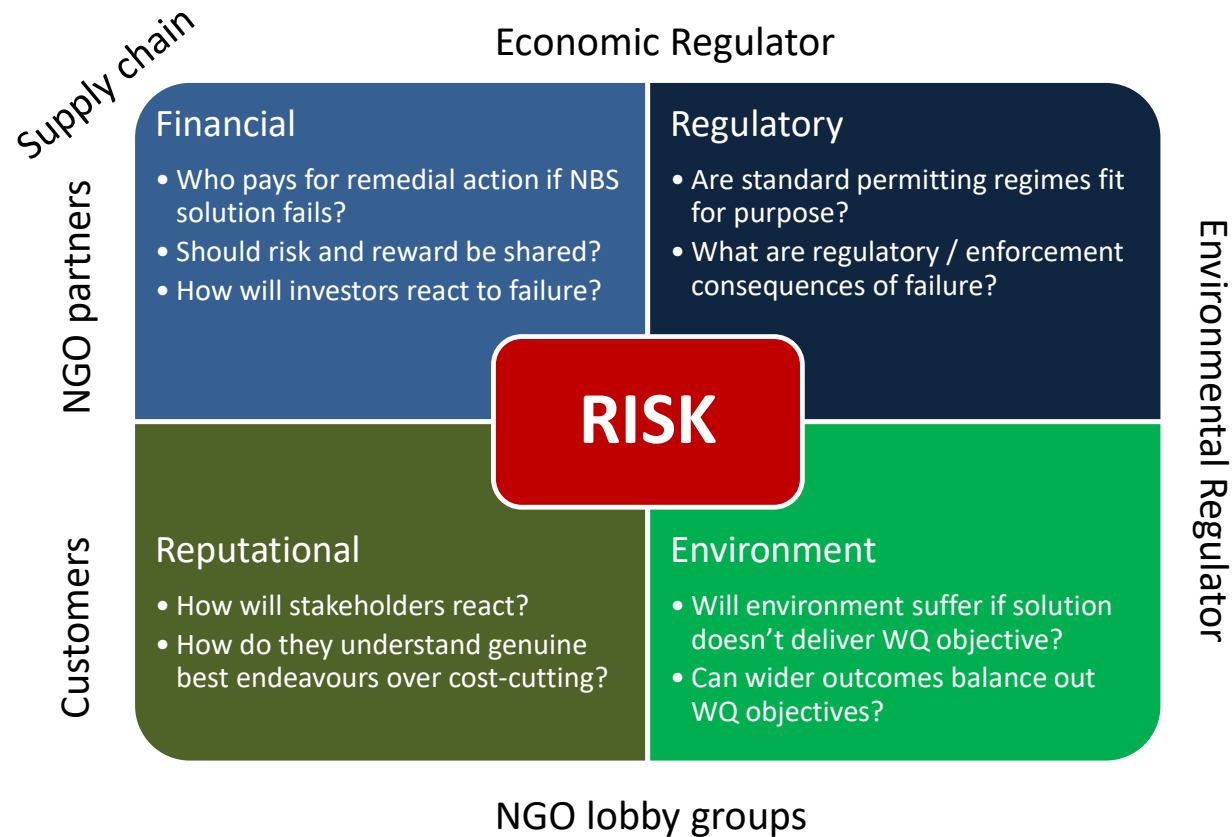


A community asset

Six capital outcomes of Ingoldisthorpe



Risk in innovation



Standard schemes fail, we are just more practised in mitigating hard engineering risk

Mitigating risk through partnership

- WINEP reform discussions with Defra & Ofwat
- Innovative Green Finance risk-sharing models

Supply chain
NGO partners
Customers

Economic Regulator

Financial

- Who pays for remedial action if NBS solution fails?
- Should risk and reward be shared?
- How will investors react to failure?

Regulatory

- Are standard permitting regimes fit for purpose?
- What are regulatory / enforcement consequences of failure?

RISK

Reputational

- How will stakeholders react?
- How do they understand genuine best endeavours over cost-cutting?

Environment

- Will environment suffer if solution doesn't deliver WQ objective?
- Can wider outcomes balance out WQ objectives?

Environmental Regulator

NGO lobby groups

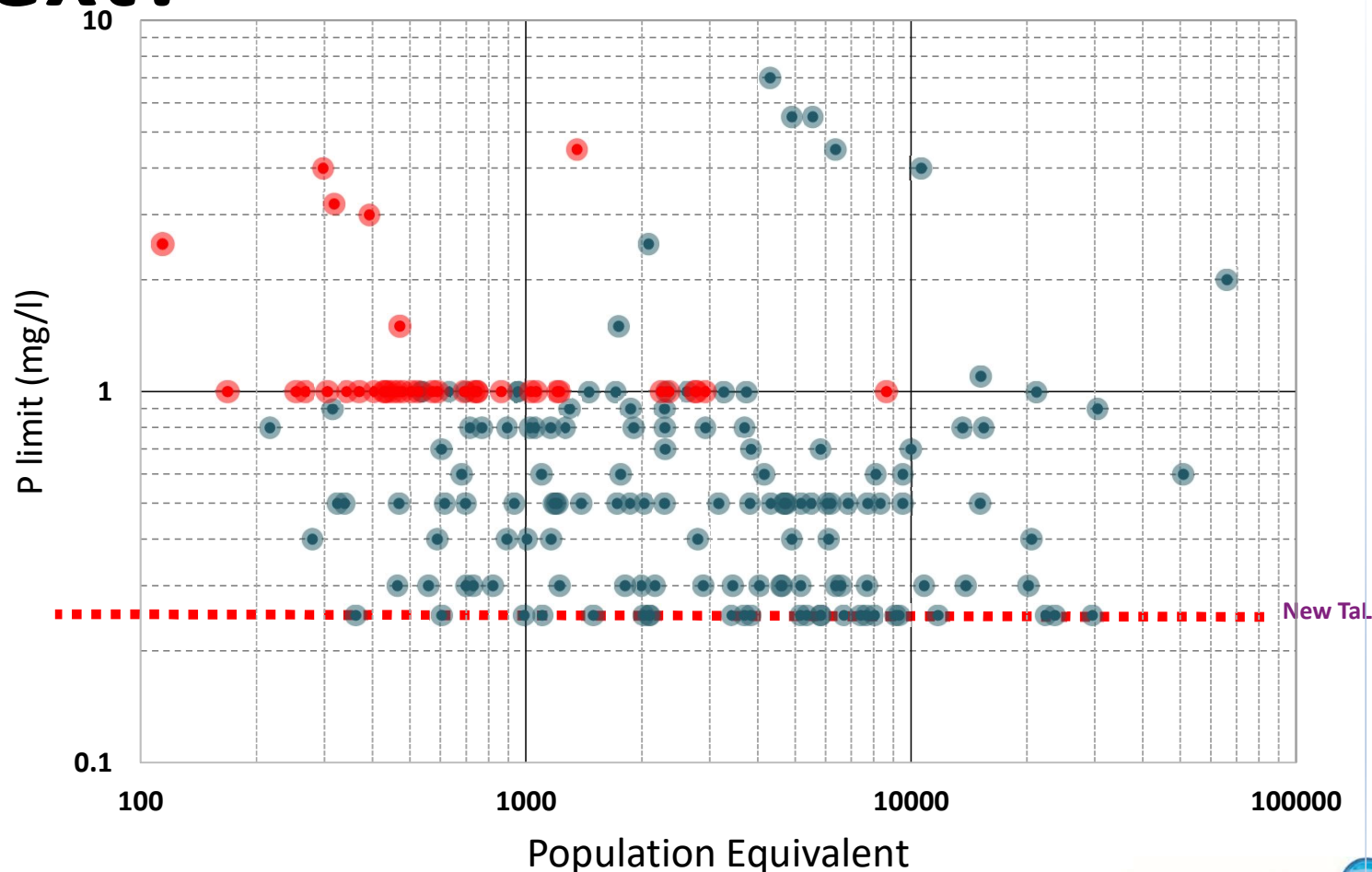
Environment Agency Task & Finish Group and permitting trials

- Partnership delivery
- CaBA Wetland group

Sponsoring & enabling collaborative research with companies, academics & EA

Where next?

- Phosphorous pollution is one of the most common pressures on waterbodies.
- We have over 170 phosphorous schemes to protect or improve the environment.
- More than half take us beyond previous technically achievable limit (1mg/l)
- This all comes at significant cost and risks driving up CO2 emissions



So we've committed to look at wetland feasibility of 34+ sites

Thank you 
for listening