

Assessing the impact of pollution management on freshwater biodiversity in a Protected Landscape

New Forest Biodiversity Forum Conference

PhD research

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Status classification of rivers and lakes across England

Only 14% of rivers in England meet Good Ecological Status.

Only 1 lake and 3 rivers reach high status.



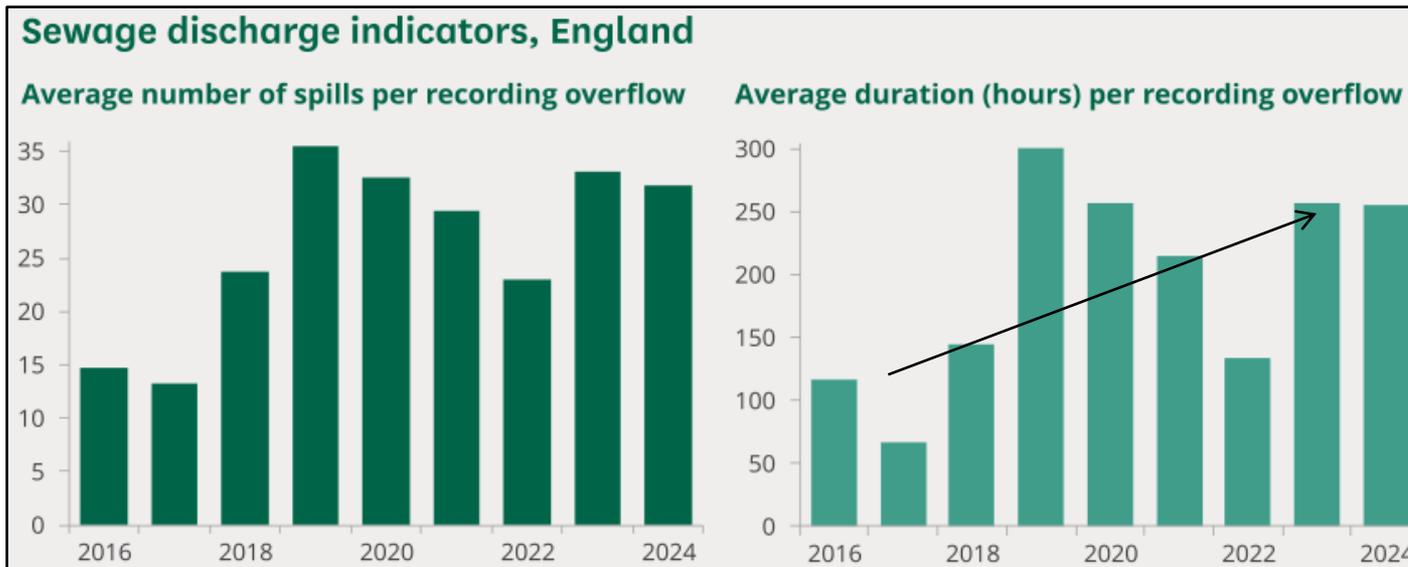
Combined Sewer Overflows: national picture



3.6 billion hours of spills in 2024.

Recorded 31.8 spills on average per overflow.

UK government's target is less than 10 spills per overflow per year.



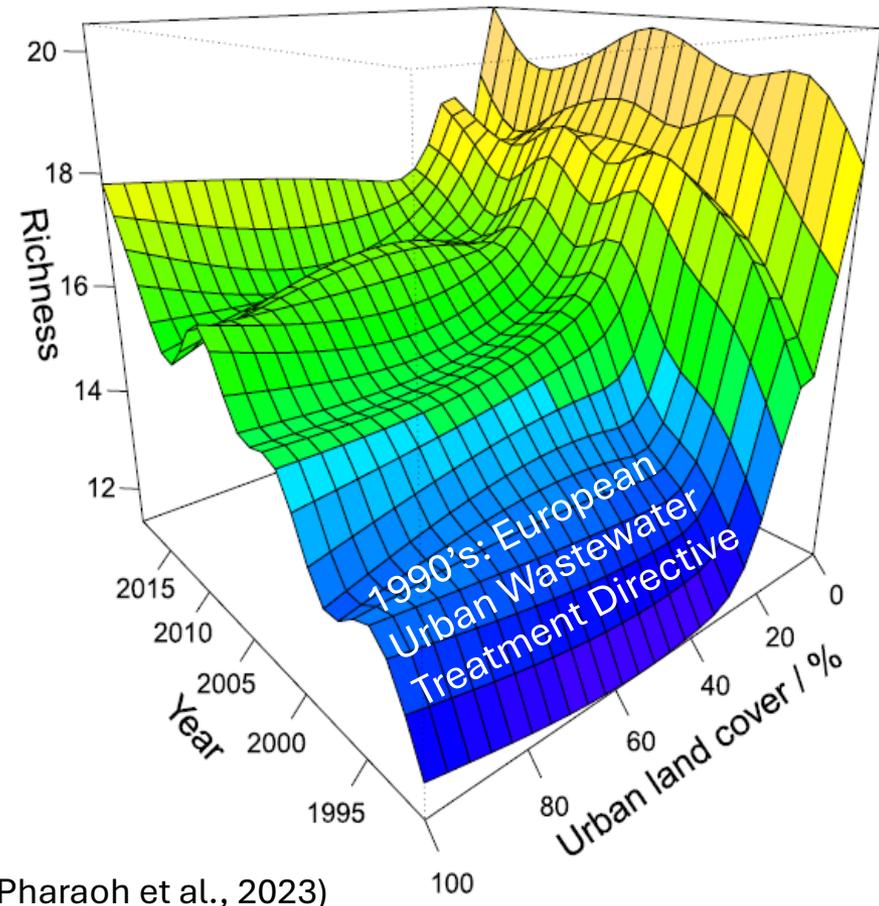
(House of Common Library et al., 2024)

National shifting macroinvertebrate trends

Overall increase in species richness from 1991 - 2019

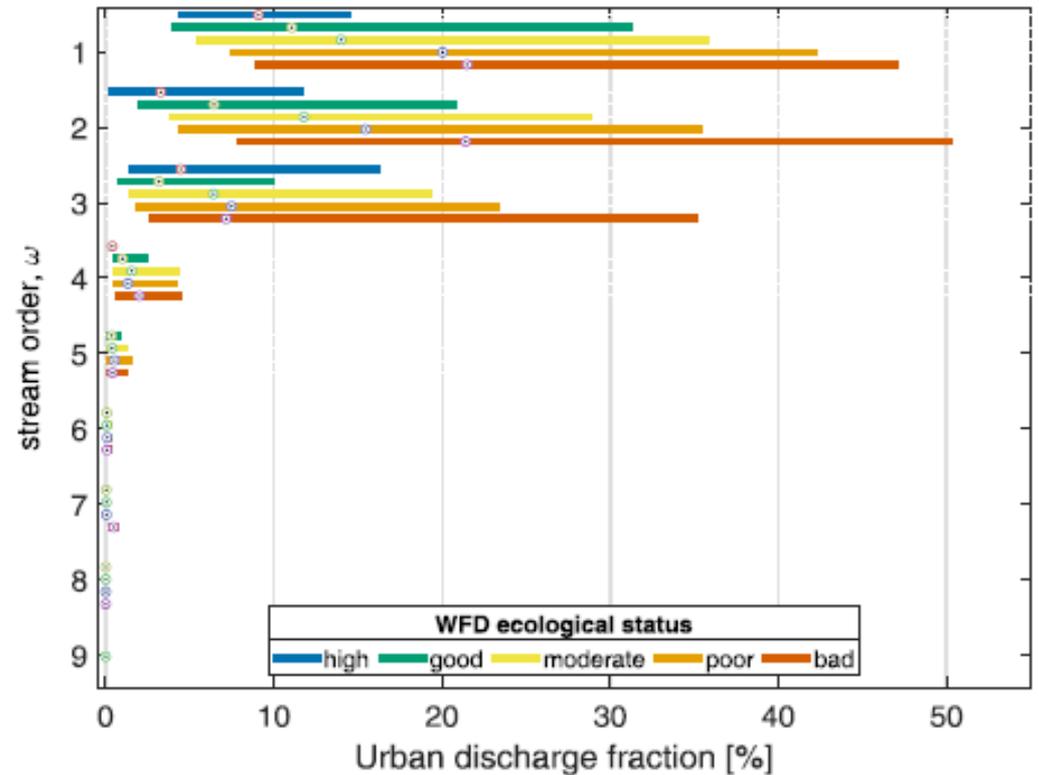
- Urban rivers gained more pollution sensitive species.
- Intense agriculture is still a limiting factor in the recovery of pollution sensitive species.
- National scale increases in richness may disguise localised declines.

Temporal trends in macroinvertebrate richness



Headwater streams

- Headwater streams are highly vulnerable due to limited dilution and sensitive ecosystems
- The position of water infrastructure is a major factor in how pollution impacts on water quality.
- Its effect weakens in medium rivers and disappears in large rivers.



(Buttner et al., 2022)

Status classification of waterbodies across New Forest

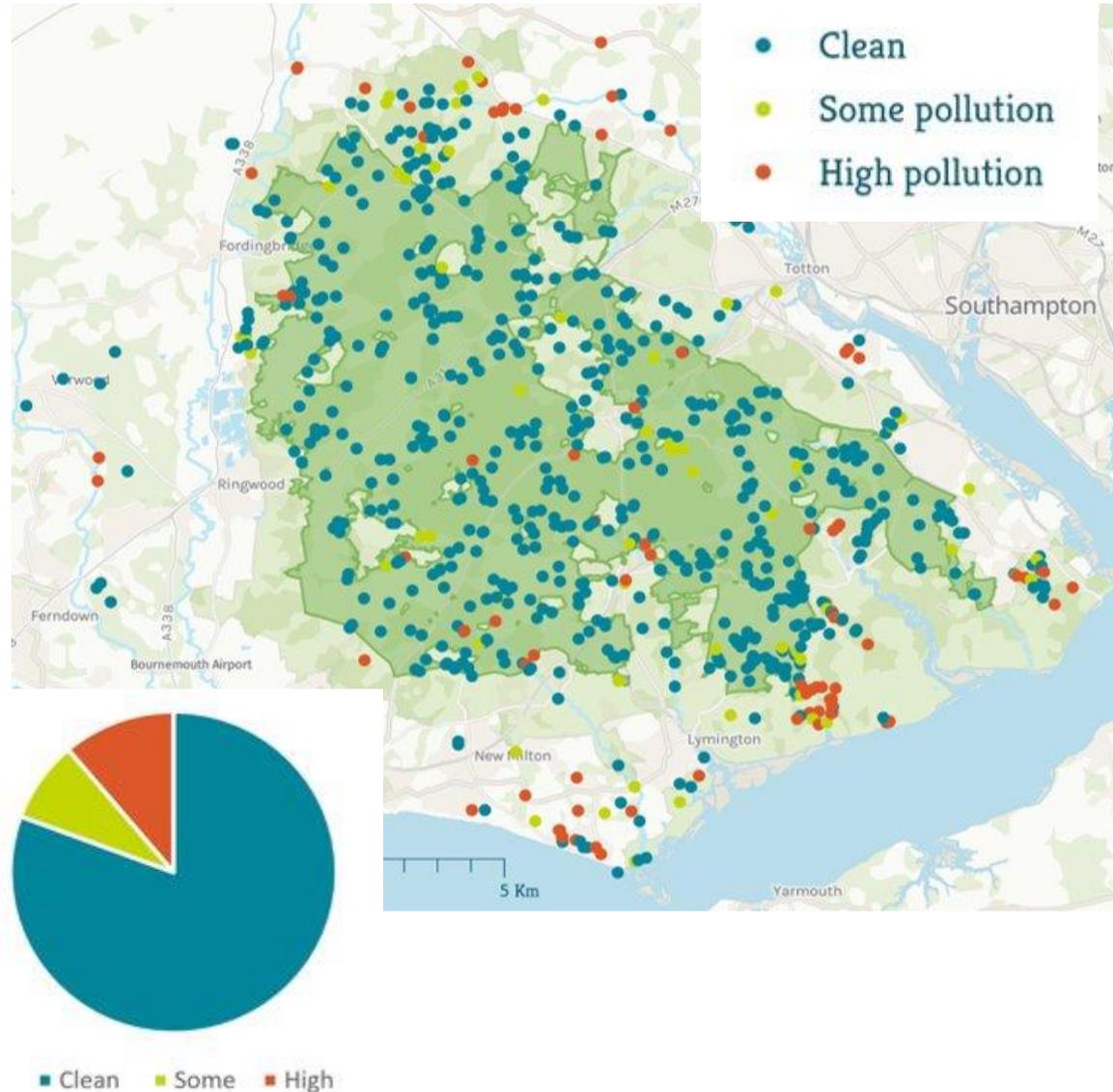
Across 18 waterbodies only 3 are achieving good ecological status.

Water body categories	Natural	Artificial	Heavily modified	Total
River, canals and surface water transfers	8	0	8	16
Lake	0	0	2	2
Coastal	0	0	0	0
Estuarine	0	0	0	0
Groundwater	0	0	0	0
Total	8	0	10	18

Number of water bodies	Ecological status or potential					Chemical status	
	Bad	Poor	Moderate	Good	High	Fail	Good
18	0	1	14	3	0	18	0

New Forest – Important Freshwater Areas

- NF is the largest freshwater biodiversity hotspot
- High density of Species of Conservation Concern
- Abundance of clean unpolluted areas
- However repeat testing has shown a 6% deterioration.



Research aims

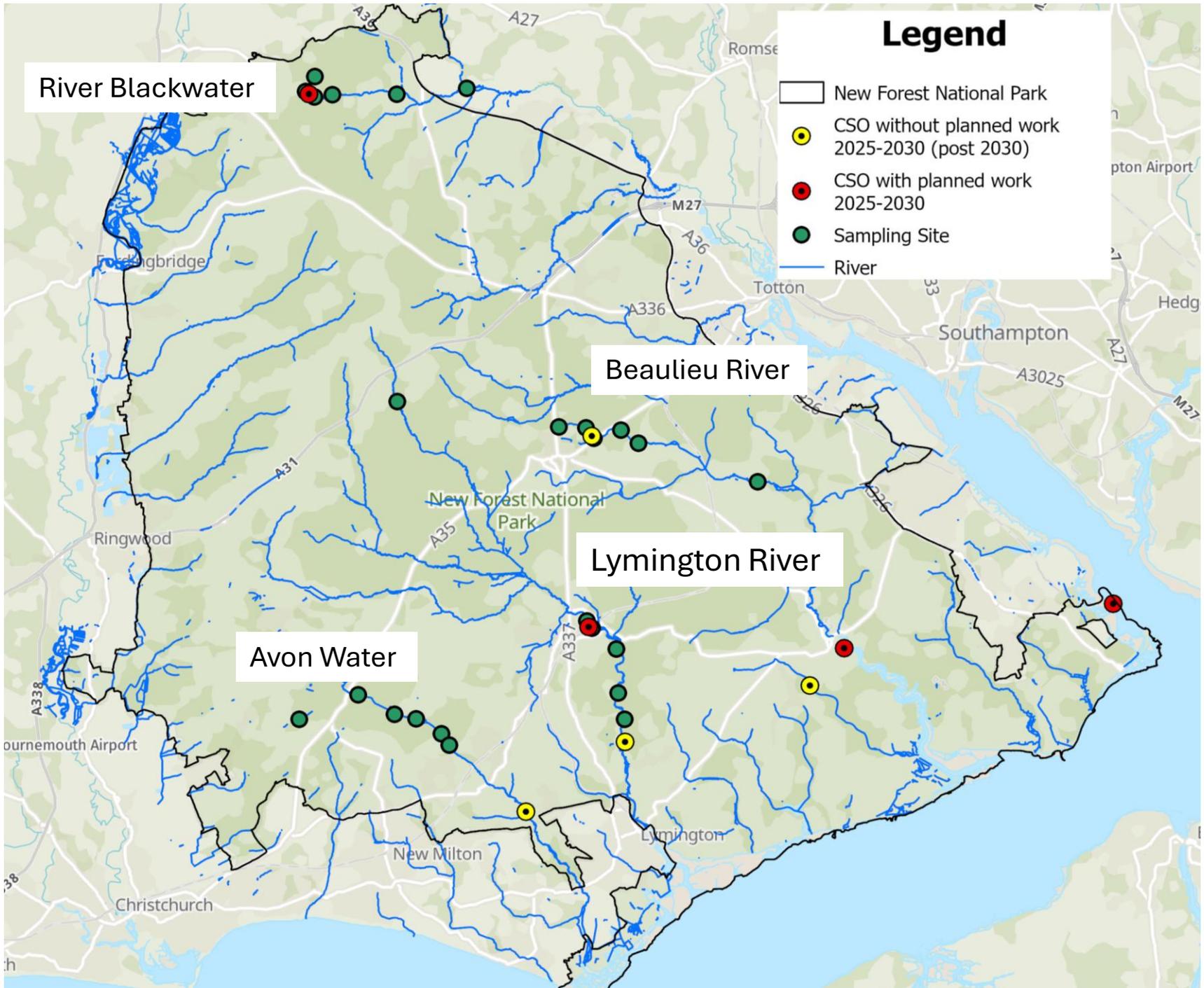
“To better understand these degraded systems within a high biodiverse landscape”



The NF is an excellent location to assess pollution dynamics:

- Density of CSO's
- Spotlight on headwaters
- High proportion of semi natural habitat
- Lower levels of farm pollution
- Optimistic about future investment

© Gemma Ströde
Floodplain and headwater stream of the Beaulieu River downstream of CSO, January 2025



Legend

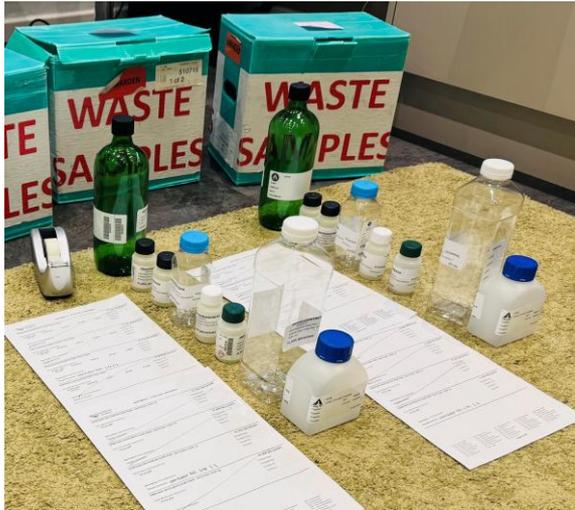
River Blackwater

Beaulieu River

Lymington River

Avon Water

Fieldwork

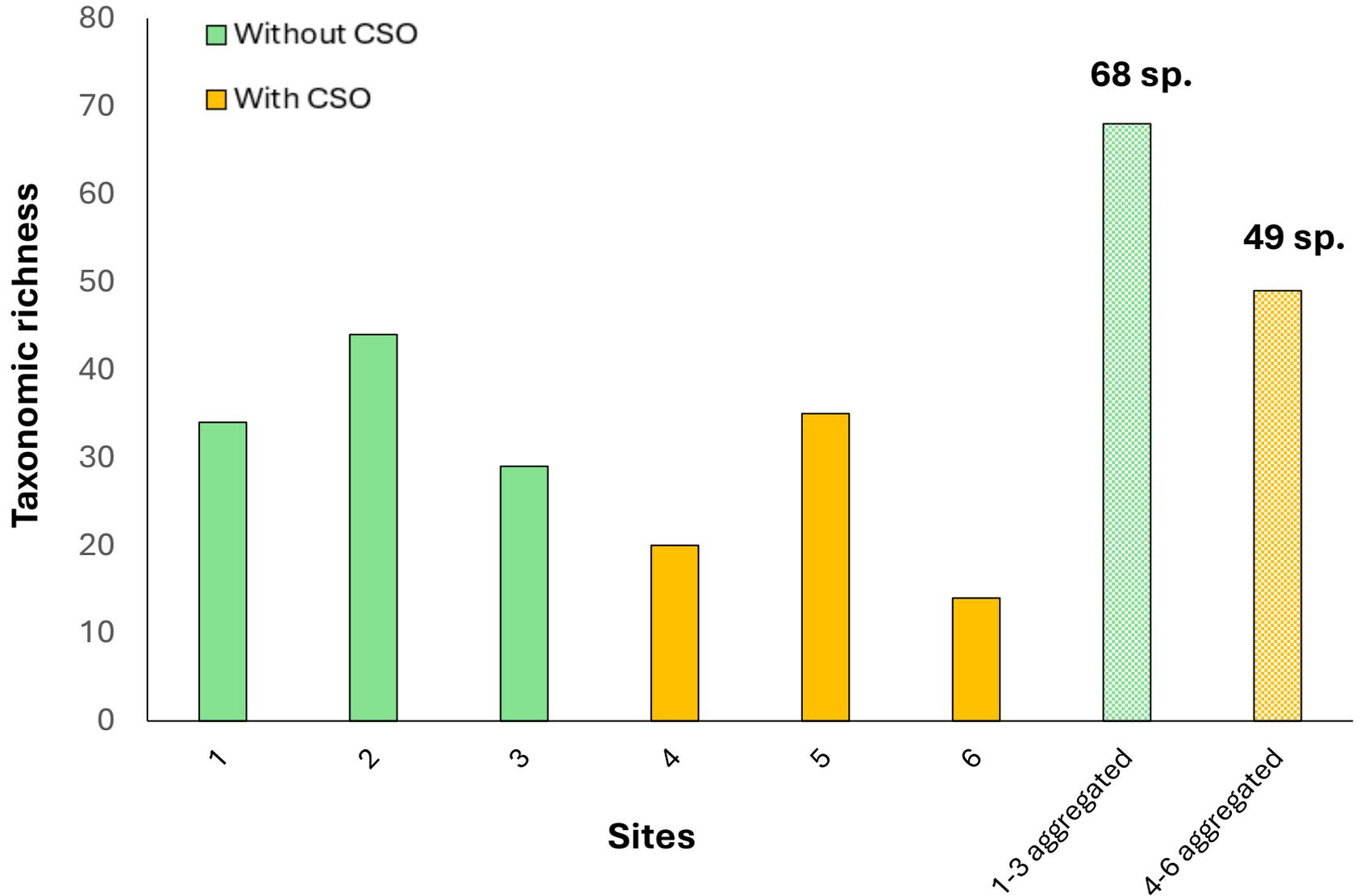


Lab work



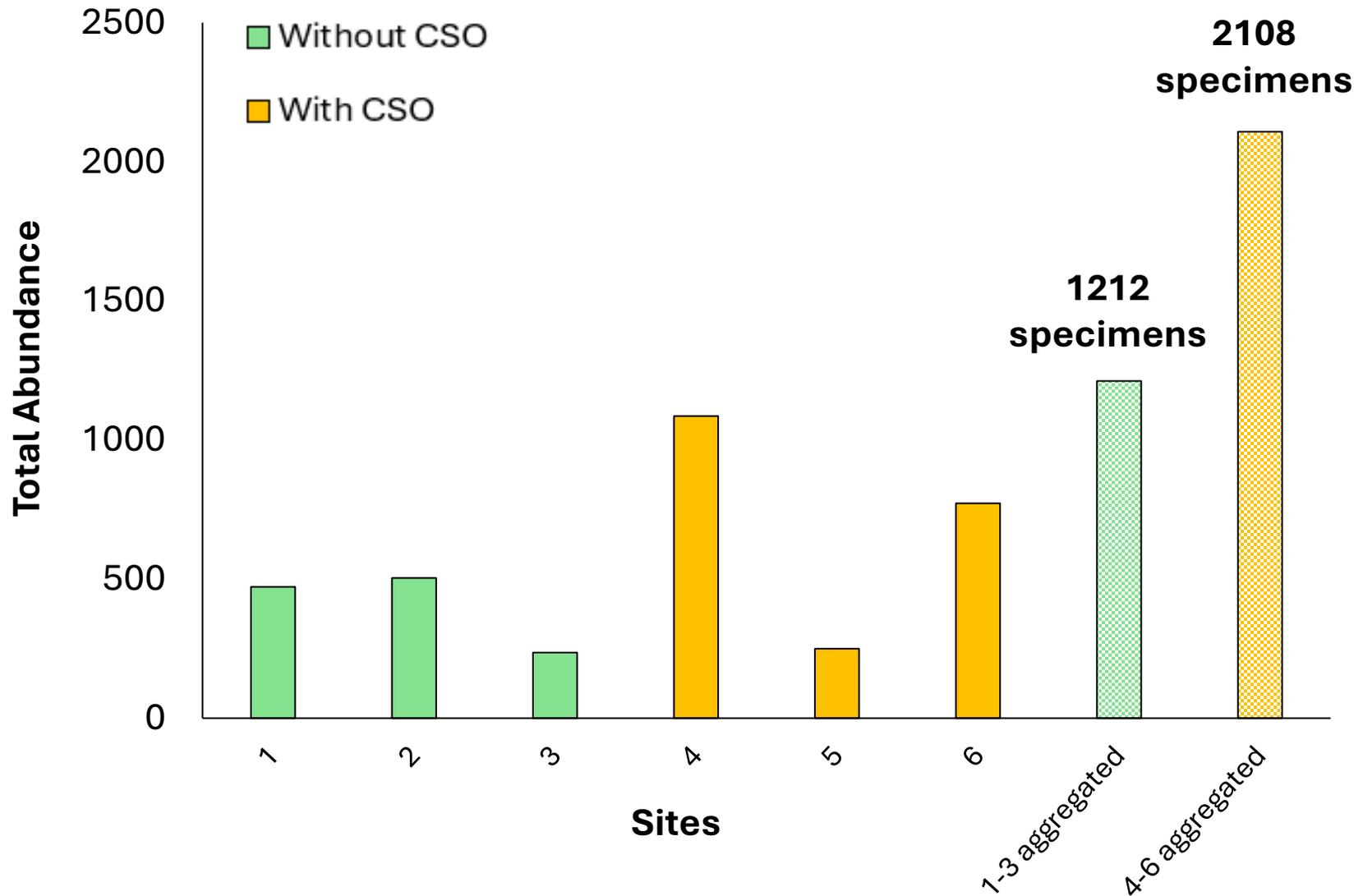
Results: macroinvertebrate richness

Taxonomic richness = 92 species across 6 sites

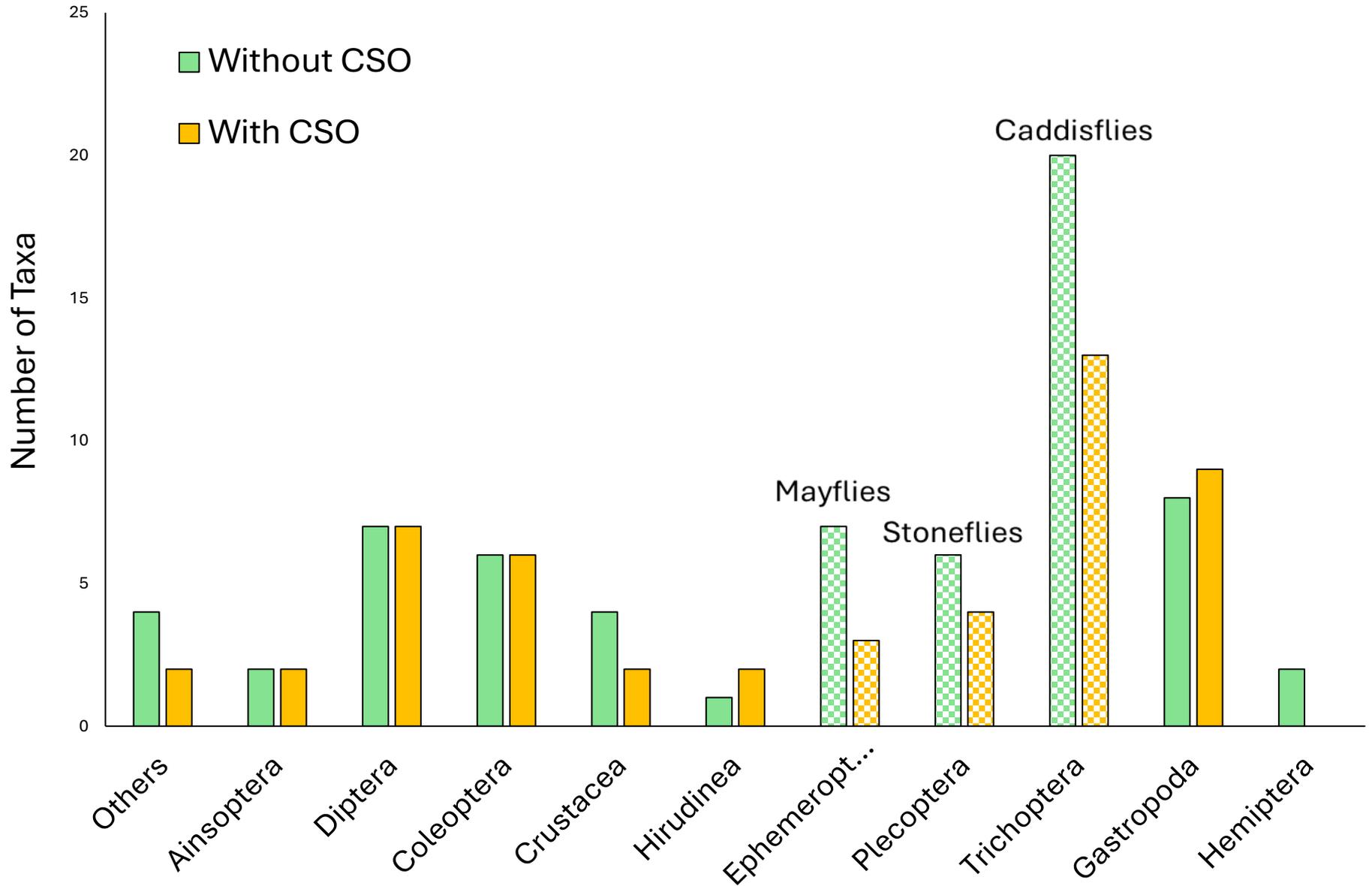


Results: macroinvertebrate abundance

Taxonomic abundance = 3320 individuals across 6 sites



Results: richness by taxonomic groupings



Summary



Lymington river: floodplain pond, downstream of CSO, January 2025

Next steps: continuous water quality monitoring, catchment plans, floodplain ponds

- Freshwater habitats under pressure and CSO pollution is a major concern.
- Local statutory data showing signs of decline.
- Recent sampling shows macroinvertebrates richness higher at non-CSO sites.
- Sensitive EPT groups reduced near CSOs.
- Small data set – more results needed.

Acknowledgements and thanks



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