

Water Resources and the Environment

Are we fit for 2050?



Dr Nathan Richardson (RSPB/Blueprint for Water)

(nathan.richardson@rspb.org.uk)

CIWEM, London, 5th December 2018

Blueprint for Water

WATER PEOPLE NATURE

BLUEPRINT FOR PR19

ENVIRONMENTAL OUTCOMES FOR THE PRICE REVIEW

Blueprint for Water

WATER PEOPLE NATURE

BLUEPRINT FOR PR19 – SHARED PRINCIPLES FOR COLLABORATION BETWEEN WATER COMPANIES AND ENVIRONMENTAL ORGANISATIONS

Blueprint for Water organisations and water companies share many years of working together to improve the water environment for the benefit of people and nature. Together, Blueprint and water companies have collaborated on innovation and ideas, on the development of policy and plans and have developed partnerships to successfully co-deliver projects on issues as wide ranging as water efficiency, customer engagement and catchment management.



We each want to continue to work together to play our part in ensuring that together, we truly are the first generation to leave the environment in a better state than when we found it. To help achieve this, we agree to the following shared principles, which set out how we will work together going forward.

1. Blueprint and companies will collaborate on areas of common interest across policy, planning and project delivery, including by supporting and recognising the **Importance of the Catchment Based Approach**, building customer legitimacy, and taking account of those delivering additional environmental and social benefits.
2. Blueprint and companies recognise the roles of both sectors as **environmental stewards**, and will work together to ensure our staff, boards, customers and members appreciate the fundamental links between water services and the environment, as part of being increasingly connected to nature.
3. Blueprint and companies will work to support the **principles and deliver obligations** enshrined in the Water Framework Directive and advocate for effective implementation of current legislation, which is to be brought into domestic legislation within the European Union (Withdrawal) Act 2018, including the Precautionary Principle, to ensure that the achievements made to date are not lost.
4. Blueprint and companies commit to sharing data in a timely and transparent way, making **key datasets openly available** to work together to better understand environmental impact.
5. Blueprint and companies recognise the importance of **maintaining services to customers and protecting the environment**, and will work together to tackle current and future pressures and increase the resilience of ecosystems and the natural capital upon which water services depend.

*noting some data may be commercially or otherwise sensitive.

www.blueprintforwater.org.uk



What are the water companies planning for the environment?

Each company's customer-facing business plan has been awarded a score: green showing good progress; amber showing some progress; and red showing insufficient progress. Grey shows where the information included by companies in the plans published for customers, or provided to us on request, is insufficient to support a fair assessment.

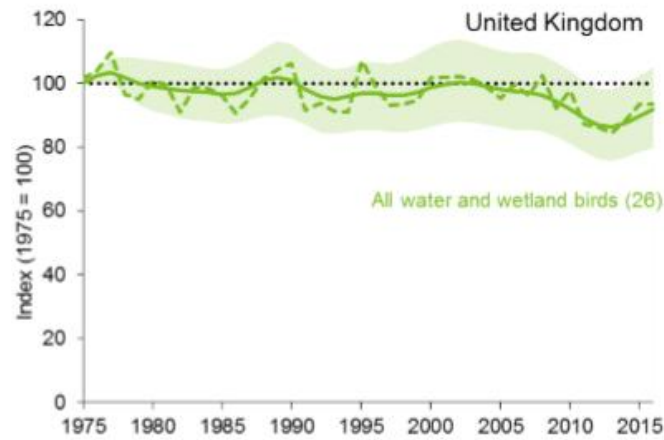
Plans to ...	...reduce abstraction licences where they risk damaging the environment.	...manage operations so less is taken from environmentally sensitive sources.	...give fair consideration to measures to reduce demand.	...ensure no increase of water taken from environment.	...include tariffs for all on meters to protect customers and to encourage water efficiency.	...promote metering including 80% metered in water stressed areas.	...implement widespread catchment management.	...improve water bodies to Good Ecological Status.	...reduce pollution from sewage works and other discharges.	...prevent rainwater overwhelming sewers including through use of SuDS.
Affinity Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
United Utilities	●	●	●	●	●	●	●	●	●	●
Wessex Water	●	●	●	●	●	●	●	●	●	●
South West Water	●	●	●	●	●	●	●	●	●	●
Southern Water	●	●	●	●	●	●	●	●	●	●
Yorkshire Water	●	●	●	●	●	●	●	●	●	●
Sewern Trent Water	●	●	●	●	●	●	●	●	●	●
Thames Water	●	●	●	●	●	●	●	●	●	●
Portsmouth Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
South East Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Anglian Water	●	●	●	●	●	●	●	●	●	●
Northumbrian Water	●	●	●	●	●	●	●	●	●	●
Bristol Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Cholderton & District Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Dŵr Cymru/Welsh Water	●	●	●	●	●	●	●	●	●	●
Sembcorpournemouth Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Cambridge Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
South Staffs Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Essex & Suffolk Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Dee Valley Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●
Sutton & East Surrey Water	●	●	●	●	●	●	●	●	N/A - does not provide waste water services	●

Alignment of companies' plans with Blueprint's asks

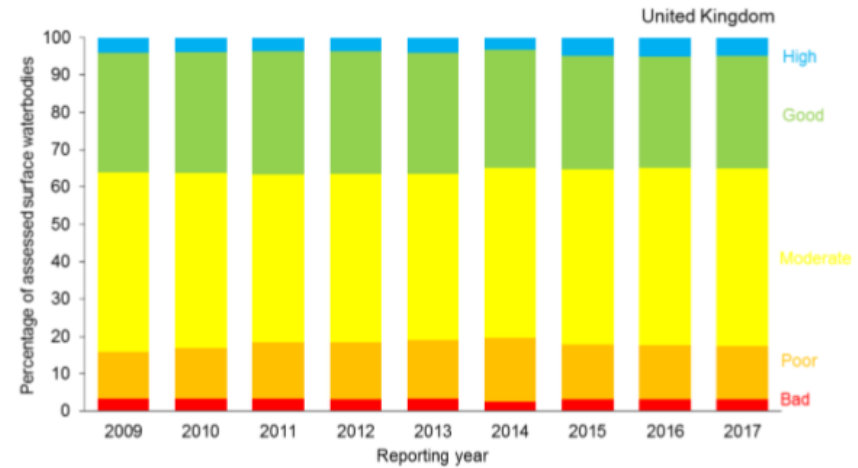
Are we fit for 2050?

NO

Failing the current challenge

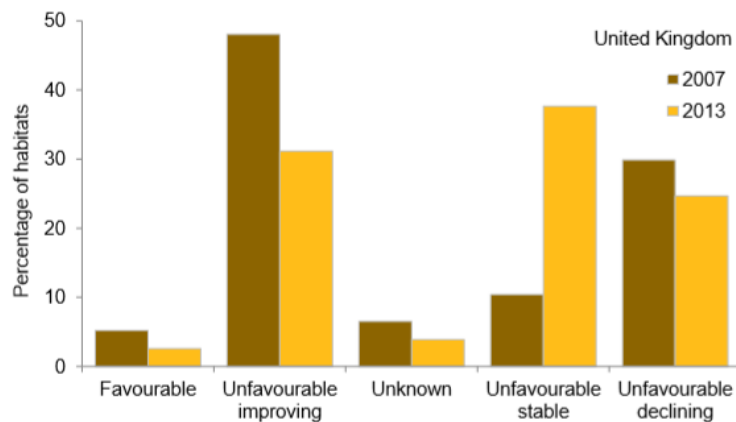


Change in abundance of water & wetland birds

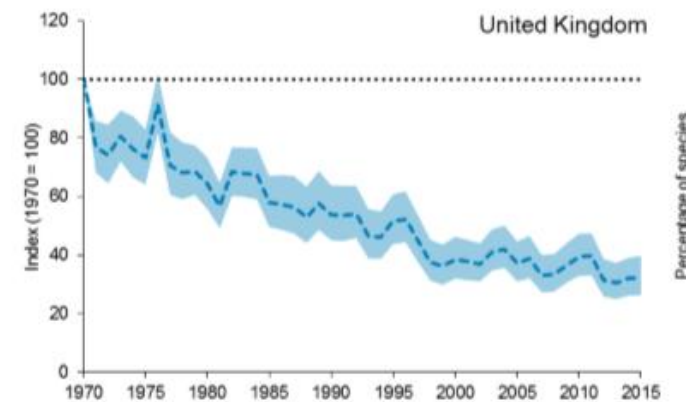


Change in WFD Compliance

More than 50% UK freshwater and wetland species are in decline



Change in condition of UK habitats of EU importance



Change in abundance of UK Priority Species

1 in 7 of the UKs freshwater species are threatened by extinction (SoN, 2016)

A week in the life of the world | Global edition
9 NOVEMBER 2018 | VOL. 199 No. 23 | £4.50 | €6.95*

The Guardian Weekly

The age of extinction

SPECIAL REPORT

African elephant	Vulnerable
African wild dog	Endangered
Albacore tuna	Near threatened
Amur leopard	Critically endangered
Amur tiger	Endangered
Asian elephant	Endangered
Beluga	Near threatened
Benugal tiger	Endangered
Bigeye tuna	Vulnerable
Black rhino	Critically endangered
Black spider monkey	Vulnerable
Black stork	Endangered
Blue whale	Vulnerable
Blowfish	Endangered
Bonobo	Critically endangered
Bornean orangutan	Critically endangered
Borneo pygmy elephant	Endangered
Chimpanzee	Endangered
Cross river gorilla	Critically endangered
Dugong	Vulnerable
Eastern lowland gorilla	Critically endangered
Fin whale	Endangered
Forest elephant	Vulnerable
Galapagos penguin	Endangered
Ganges river dolphin	Endangered
Giant panda	Vulnerable
Giant tortoise	Vulnerable
Great white shark	Vulnerable
Greater one-horned rhino	Vulnerable
Greater sage-grouse	Near threatened
Green turtle	Endangered
Hawksbill turtle	Critically endangered
Hector's dolphin	Endangered
Hippopotamus	Vulnerable
Humphead wrasse	Endangered
Indian elephant	Endangered
Indochinese tiger	Endangered
Indus river dolphin	Endangered
Irrawaddy dolphin	Endangered
Jaguar	Near threatened
Javan rhino	Critically endangered
Leatherback turtle	Vulnerable
Loggerhead turtle	Vulnerable
Malayan tiger	Critically endangered
Marine iguana	Vulnerable
Mountain gorilla	Critically endangered
Mountain plover	Near threatened
Narwhal	Near threatened
North Atlantic right whale	Endangered
Olive ridley turtle	Vulnerable
Orangutan	Critically endangered
Plains bison	Near threatened
Polar bear	Vulnerable
Red panda	Endangered
Saola	Critically endangered
Savanna elephant	Vulnerable
Sea lions	Endangered
Sea turtle	Vulnerable
Sei whale	Endangered
Snow leopard	Vulnerable
South China tiger	Critically endangered
Southern rockhopper penguin	Vulnerable
Sri Lankan elephant	Endangered
Sumatran elephant	Critically endangered
Sumatran orangutan	Critically endangered
Sumatran rhino	Critically endangered



THE SHINING RAM'S-HORN - 80% EYED LONGHORN BEETLE - 90% WRYNECK - EXTINCT. THIN WEBLET - 84% COD - 87% HADDOCK - 99% GREY PARTRIDGE - 92% WILLOW WARBLER - 44% SMALL SKIPPER - 75% WHITE ERMINE - 70% SAND RUNNING SPIDER - 61% LING - 96% BLACK GROUSE - 80% HAIRY STONECROP - 45% TREE PIPIT - 69% APPLE BUMBLEBEE - EXTINCT. SONG THRUSH - 50% LAGOON SANDWORM - 50% CONGER EEL - 89% WHITE STORK - EXTINCT. WHIMBREL - 50% SMALL COPPER - 46% ROSEATE TERN - 52% JUNIPER - 15% WHITE LETTER HAIRSTREAK - 93% TAWNY OWL - 37% WESTERN WOOD-VASE HOVERFLY - 66% COMMON SANDPIPER - 46% CARLINE THISTLE LEAFHOPPER - 66% HOUSE SPARROW - 66% ROUND-FRUITED RUSH

PARSLEY - 54% PINTAIL - 38% EXTINCT. KINGFISHER - 17% EXTINCT. BASTARD PALM - 37% PEROP - 61% LAGOON SAND- N FRITILLARY - 67% SPOTTED 72% GREATER WATER-PARSNIP HOUS SNAIL - 50% SHAG - 45% - 90% LINNET - 55% EURASIAN - 85% HARBOUR SEAL - 23% STERCATCHER - 26% CURLEW - 43% CUCKOO - 56% WHITE- SER SPOTTED WOODPECKER - OX-SPIDER - 84% WATER VOLE ERGREEN - 58% BLACK VEINED T. TURTLE DOVE - 98% YELLOW PLOVER - EXTINCT. MALLARD - E TERN - 34% FLY ORCHID - 38% TONE - 47% SPOTTED SULPHUR FRITILLARY - 91% PHANTOM OOKOUT SPIDER - 60% KENTISH YELLOW BIRD'S-NEST - 47% RABBIT - 60% WOLFFISH - 96% ARK - 59% IRON BLUE MAYFLY 83% BURNT-TIP ORCHID - 69% TAIN HARE - 99% SMALL WATER- LUA - 76% ORANGE SPOTTED EMERALD DRAGONFLY - EXTINCT. CORN MARIGOLD - 77%

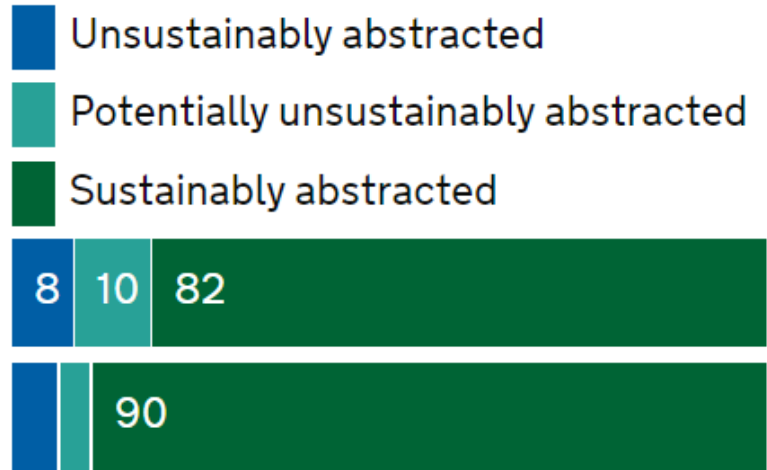
BULLFINCH - 39% FIELD FLEAWORT - 42% REDWING - 54% HEDGEHOG - 95% LARGE MASON BEE - 50% PURPLE SANDPIPER - 50% MAZARINE BLUE BUTTERFLY - EXTINCT. RING OUZEL - 72% WILLOW TIT - 93% PINK-STRIPED BLOOD- VEIN - 73% ANNUAL KNAVEL - 65% BEWICK'S SWAN - 95% POCHARD - 67% SAND CATCHFLY - 50% FRESHWATER PEARL MUSSEL - 75% V-MOTH - 99% SMALL TORTOISESHELL - 75% MOLE CRICKET - 90% LESSER REDPOLL - 87% BLUE UNDERWING MOTH - EXTINCT. HEN HARRIER - 27% THAMES RAM'S-HORN SNAIL - 50% GRIZZLED SKIPPER - 54% MEADOW PIPIT - 34% OPPOSITE LEAVED PONDWEED - 77% LARGE COPPER BUTTERFLY - EXTINCT. CRESTED COW-WHEAT - 60% SLAVONIAN GREBE - 57% SWIFT - 51% SINCE 1995 HEATH CUDWEED - 72% RED FOX - 41% BURBOT - EXTINCT. FULMAR - 33% FIELDFARE - 80% DUSKY THORN - 98% HOUSE MARTIN - 48% GOLDENEYE - 53% GARDEN TIGER - 92% BROWN LONG-EARED BAT - 31% ESSEX SKIPPER - 90% WOOD WHITE - 88% HAZEL DORMOUSE - 48% BLACK REDSTART - 45% KESTREL - 50% HAIRY CANARY - 50% GOLDEN LANTERN SPIDER - 79% DIPPER - 22% SHELDUCK - 32% HAKE - 95% RED SQUIRREL - 64% SOUTHERN DAMSELFLY - 30% MUSK ORCHID - 60% PALE DOG-VIOLET - 50% SMALL GREY SEDGE CADDISFLY - 56% BROWN BEAR - EXTINCT. SEA BARLEY - 38% GREY WOLD - EXTINCT. NORTHERN BROWN ARGUS - 60% NORFOLK DAMSEL FLY - EXTINCT. TUBULAR WATER-DROPWORT - 55% LARGE MARSH GRASSHOPPER - 85% GREAT YELLOW BUMBLEBEE - 70% SOPRANO PIPISTRELLE - 90% PEARL-BORDERED FRITILLARY - 77% CORN BUTTERCUP - 82% LITTLE OWL - 64% HAIRY CLICK BEETLE - 62% GARDEN DART - 98% REED BUNTING - 31% GREY WAGTAIL - 39% SMALL WHITE ORCHID - 65% WHITE ADMIRAL - 71% HALIBUT - 99.8% GRAYLING - 72% BLUE STAG BEETLE - EXTINCT. LARGE-MOUTHED VALVE SNAIL - 38% GREENFINCH - 46% DOTTEREL - 57% COMMON TOAD - 68% RINGED PLOVER - 59% LADYBIRD SPIDER - 66% TRIANGLE HAMMOCK SPIDER - 62% HEDGE RUSTIC - 97% STARLING - 81% YELLOWHAMMER - 56% SWOLLEN SPIRE SNAIL - 50% FIELD GENTIAN - 49% HARVEST MOUSE - 29% SHORTHAIRED BUMBLEBEE - EXTINCT. TREE SPARROW - 90%

Lest We Forget.

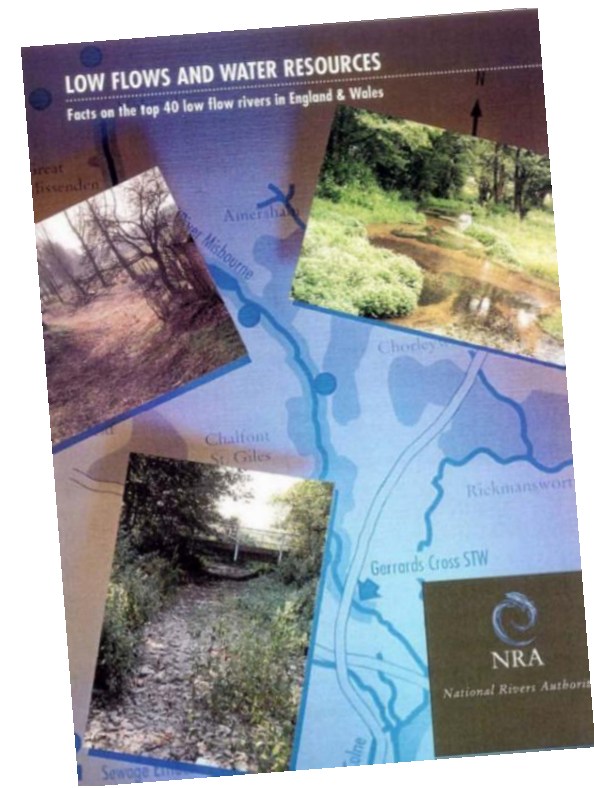
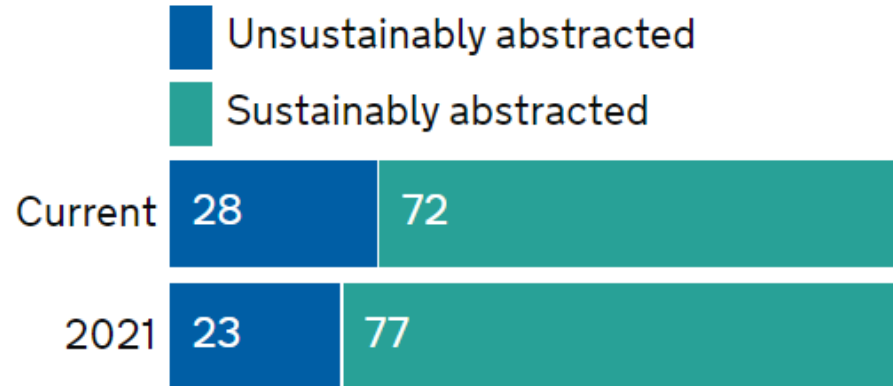
Restoring Sustainable Abstraction

- Over 270 abstraction licences have been revoked or amended since 2008. 30 billion litres a year of damaging abstraction stopped

Surface Waters - England



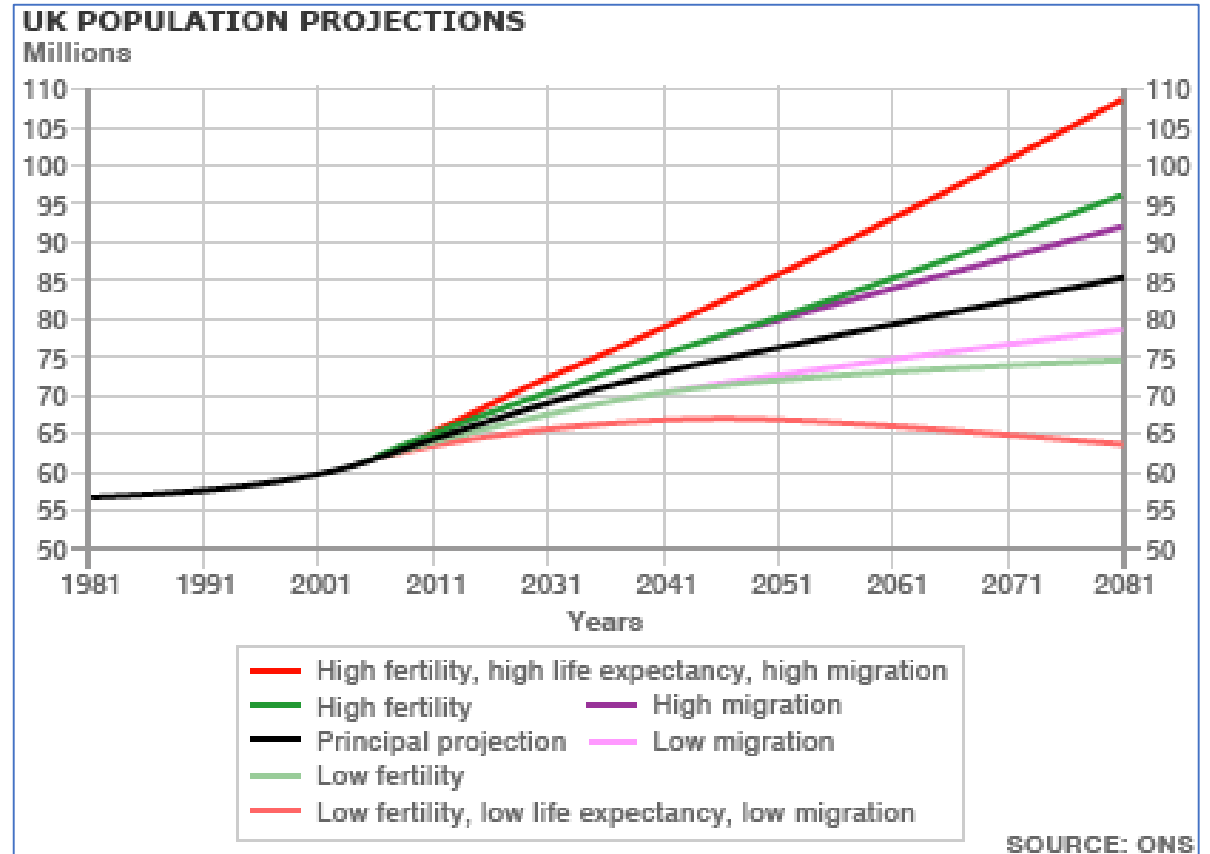
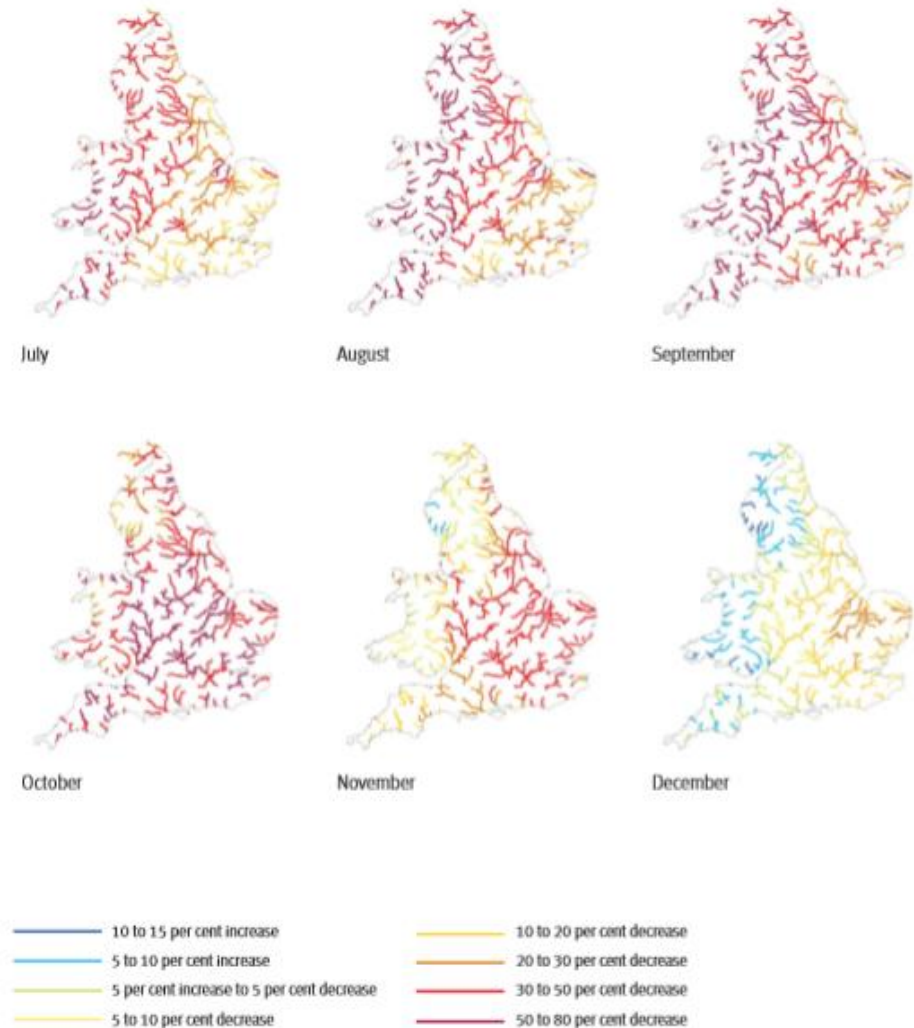
Groundwaters - England



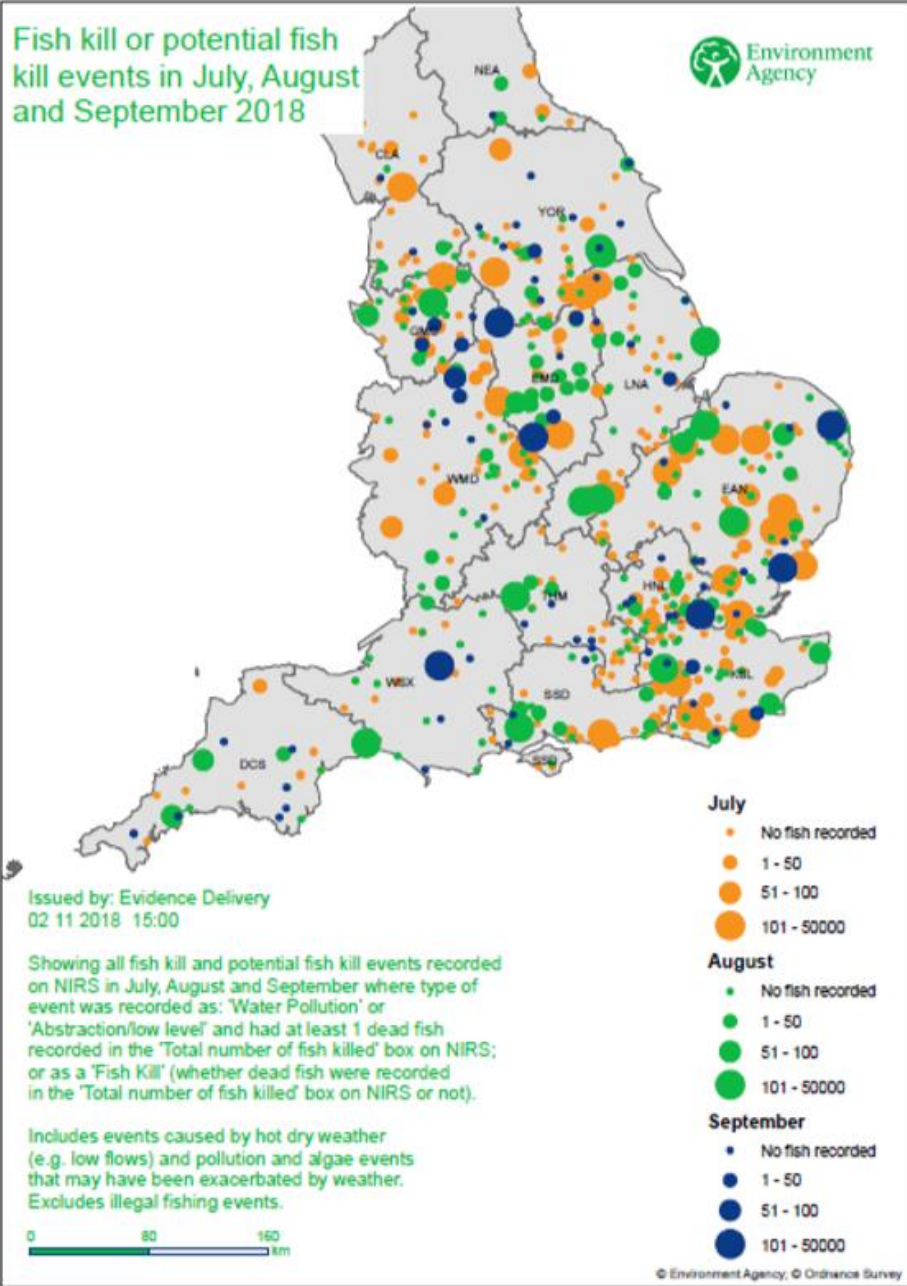
- By 2027 – the EA estimate we will be down to around 5% of surface waters unsustainably abstracted and 15% of groundwaters unsustainably abstracted

Things are likely to be much, much worse by 2050

Figure 1.4: Percentage change in mean naturalised monthly flows by 2050¹

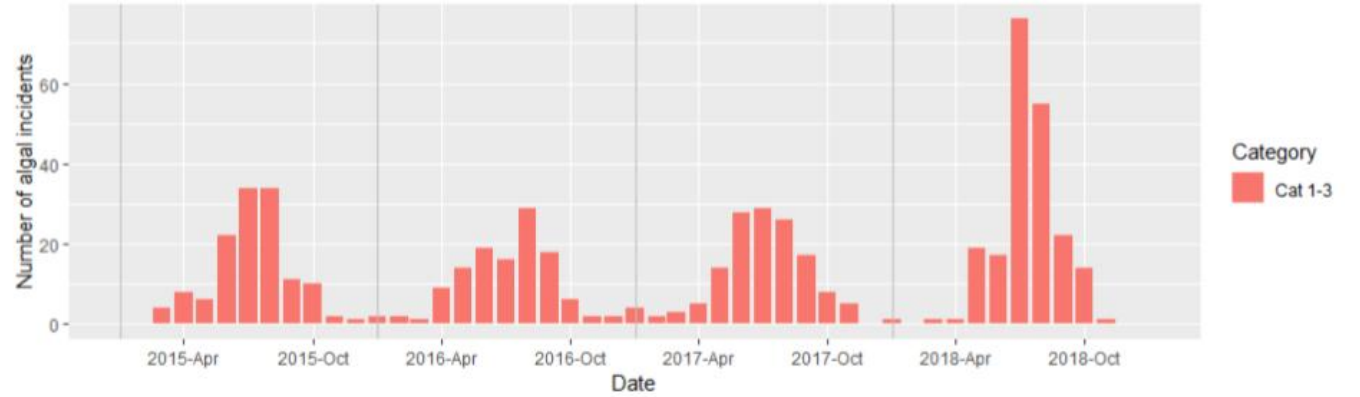


Fish kill or potential fish kill events in July, August and September 2018

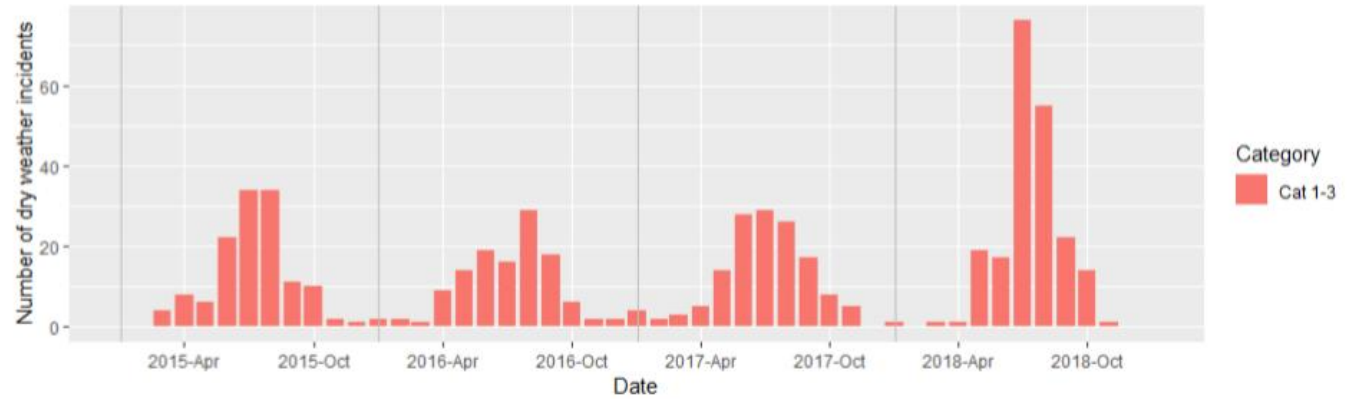


The 2018 “dry weather incident” – a taste of things to come?

Algal



All “dry weather”



Things are likely to be much, much worse by 2050

**% non compliance with the evolved WRE
EFI at the worst point in the hydrograph**

	2024 Baseline	2060 Baseline
River Glen	0	31
River Slea	0	24
River Nar SSSI	13	26
River Rhee	0	34
River Colne	61	75
River Gade	80	91
River Waithe	14	32
River Wensum SAC	0	6

In all future scenarios we cannot meet future demand and meet the environmental needs.

In nearly all rivers the extent of failure gets significantly worse

IF WE DON'T ACT

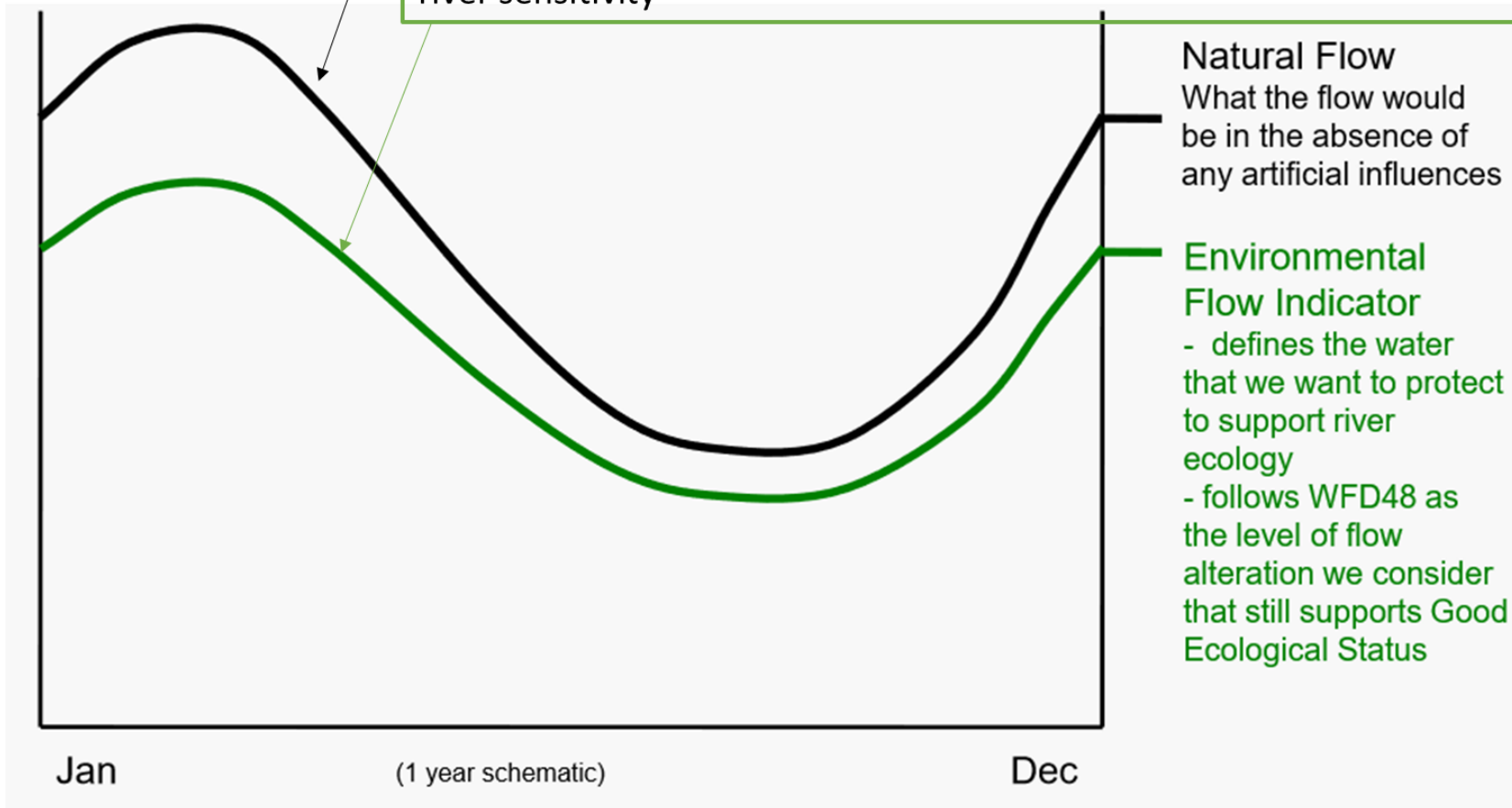
Getting fit for 2050

1. Ensuring the abstraction management system is fit for the future
2. Getting more joined-up in our water resource planning
3. Investing in the environment to improve water sector resilience

1. Ensuring the abstraction management system is fit for the future

The natural flow used in abstraction management is based on 17 years of data (1990-2007)

The EFI line sets the water regime we want to protect to support river ecology and is based on a set deviation from natural flow which varies with river sensitivity



EFI is a useful screening trigger but :

- Based on past flows
- More hydrological than hydro-ecological
- Expert opinion not modelled relationships
- Difficult to tailor it locally
- **Hard to use predictively**

1. Ensuring the abstraction management system is fit for the future

We need better tools

That enable us to relate different future flow + morphology + abstraction scenarios to likely ecological response – **DRIEDUP?**

WIREs Water 2014, 1:207–217. doi: 10.1002/wat2.1012

Focus Article

Developing hydroecological models to inform environmental flow standards: a case study from England



Megan J. Klaar,^{1,2*} Michael J. Dunbar,³ Mark Warren⁴ and Rob Soley⁵



2. Getting more joined in our water resources planning

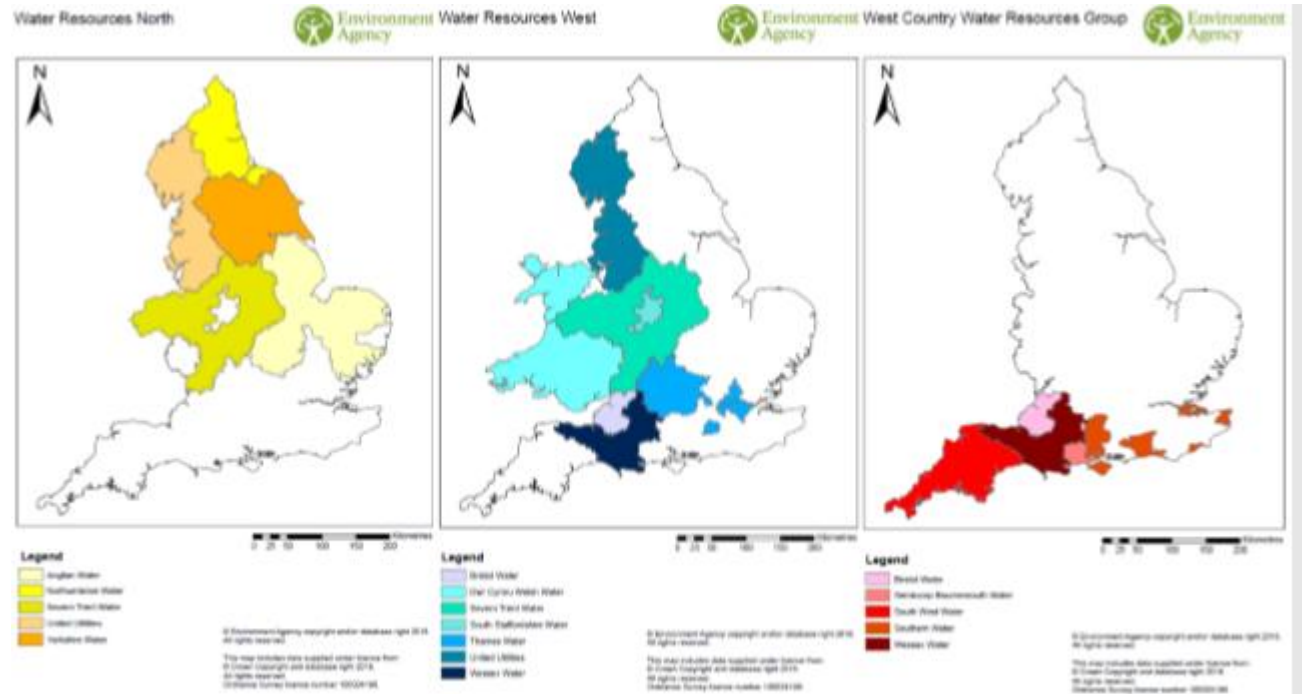
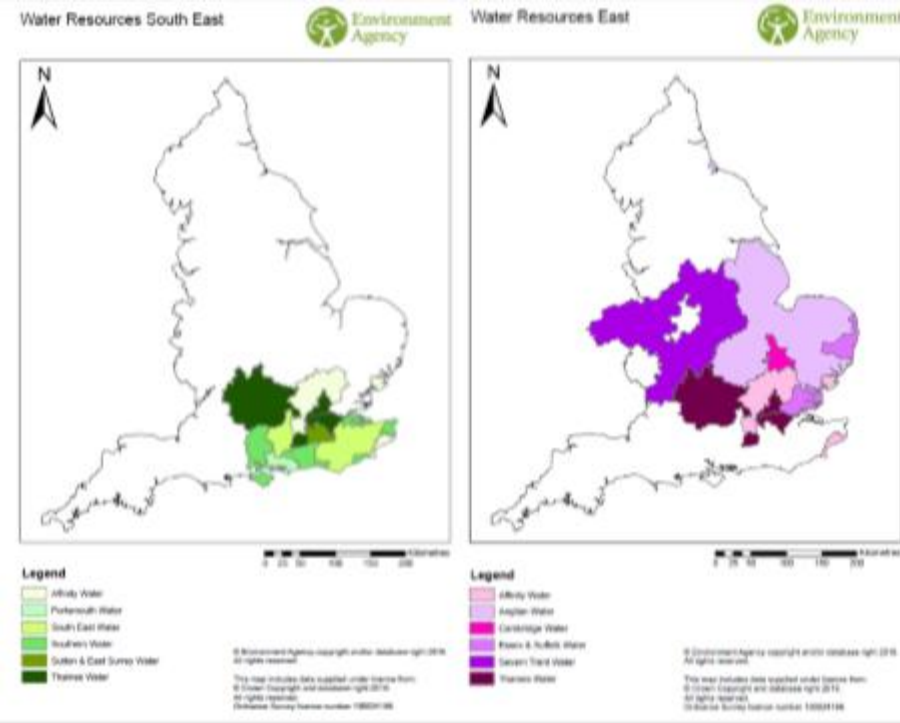
- Need a much clearer **line of sight** from national to regional and company scale wrt need/options – the plans just didn't join up! Not sure we ended up with the right options.
- Need stronger linkages to the challenges and **needs of other sectors** (agriculture, energy, environment) – ensure multiple benefits aren't missed
- Address disconnect between water resources and **water quality** management



The emerging **National Framework** will help.....

.....but....

we need the **National Framework** and the **Regional Water Resource Planning Groups** to consider future environmental needs as well as water supply needs



3. Investing in the environment to improve water sector resilience

Low Water Sector Resilience

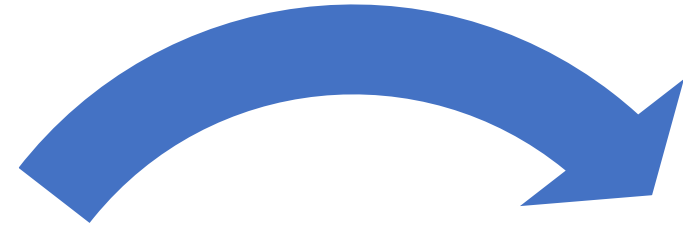
- pollution incidents, CSOs
- drought permits
- sewer flooding

Low Environmental Resilience

- risks to drinking water resources
- restrictions on abstraction
- increased flood risk

Environmental
Resilience

Water Sector
Resilience







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Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind



An index to track the ecological effects of drought development and recovery on riverine invertebrate communities

Richard P. Chadd^{a,*}, Judy A. England^b, Drew Constable^c, Michael J. Dunbar^d, Chris A. Extence^a, David J. Leeming^c, John A. Murray-Bligh^d, Paul J. Wood^f

^a Environment Agency of England, Stepping Stone Walk, Winfrey Avenue, Spalding, Lincolnshire, PE11 1DA, UK

^b Environment Agency of England, Apollo Court, 2, Bishops Square Business Park, St. Albans Road West, Hatfield, Herts, AL10 9EX, UK

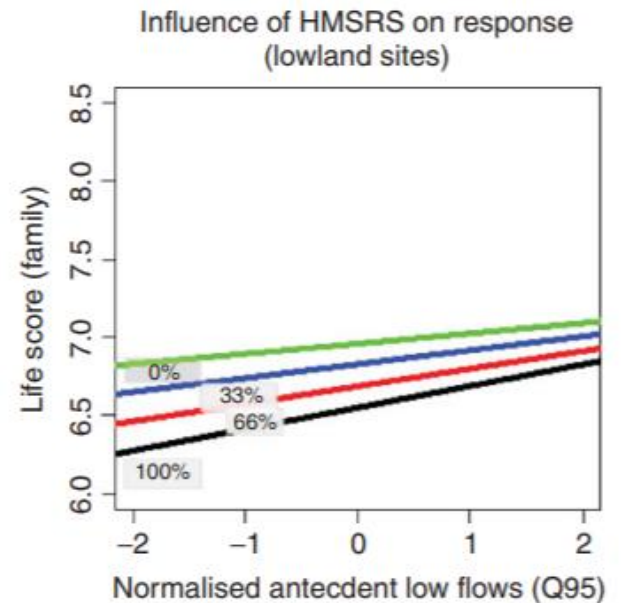
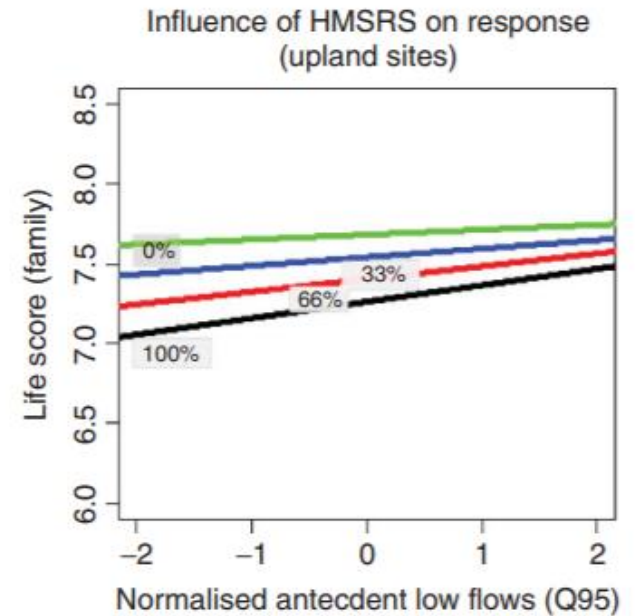
^c Environment Agency of England, Bromholme Lane, Brampton, Huntingdon, Cambridgeshire, PE28 4NE, UK

^d Environment Agency of England, Manley House, Kestrel Way, Exeter, EX2 7LQ, UK

^e DJL Ecologists, UK

^f Loughborough University, Department of Geography, Centre for Hydrological and Ecosystem Science, Loughborough, UK

“Addressing morphological degradation is a widely accepted approach in adapting to climate change to help protect our rivers from extreme events including drought (Henriques et al., 2015; Orr et al., 2015), increase ecological resilience (Dunbar et al., 2010a, 2010b; Dokulil, 2016) and protect ecosystem services (Zalewski, 2014)”.



Conclusions

- **We aren't fit for 2050; we are struggling with current challenges. But we know that the 2050 challenge is significant and shared beyond the water sector**
- We need a much clearer view on what the future water challenge looks like for our environment, as well as for other sectors
- We need to embed this understanding into our forward planning on water - abstraction management, water supply and demand management
- Then we can explore solutions that can deliver multiple benefits across sectors.....including investing in improving ecosystem resilience to improve the resilience of the water sector



Thanks for listening

nathan.richardson@rspb.org.uk