

Hydromorphology and Water Resources - Environmental standards for river flows to control water abstraction

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Sustainable management of water abstraction

Involves consideration of:

- 09 needs of society
- 09 protection of the water environment

“how much water or what flow should be left in a river to maintain a healthy ecology?”

Standards for setting flows given within WFD Quality elements :

- σσ Hydromorphology - physical habitat
- σσ Fish
- σσ Macrophytes - plants
- σσ Macro-invertebrates - insect larvae

- same ecological categories are considered within the Agency's Resource Assessment and Management (RAM) methods for setting river flow objectives

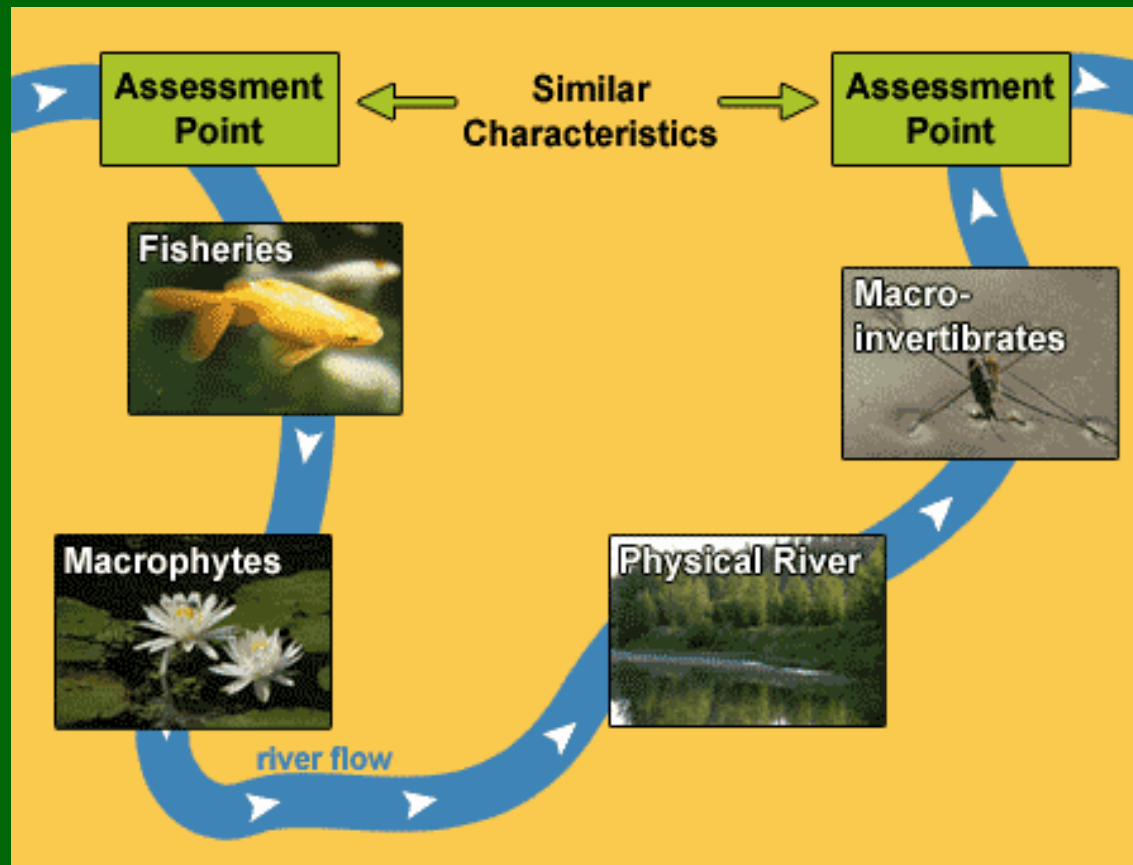
*Determine benchmark conditions:
flow and ecological indicators:*

*Score ecological sensitivity for
benchmark conditions*

*Use tables to give
River flow objectives*

*Divide flows into water available
for licensing and that to meet
river flow objectives*

RAM environmental weighting

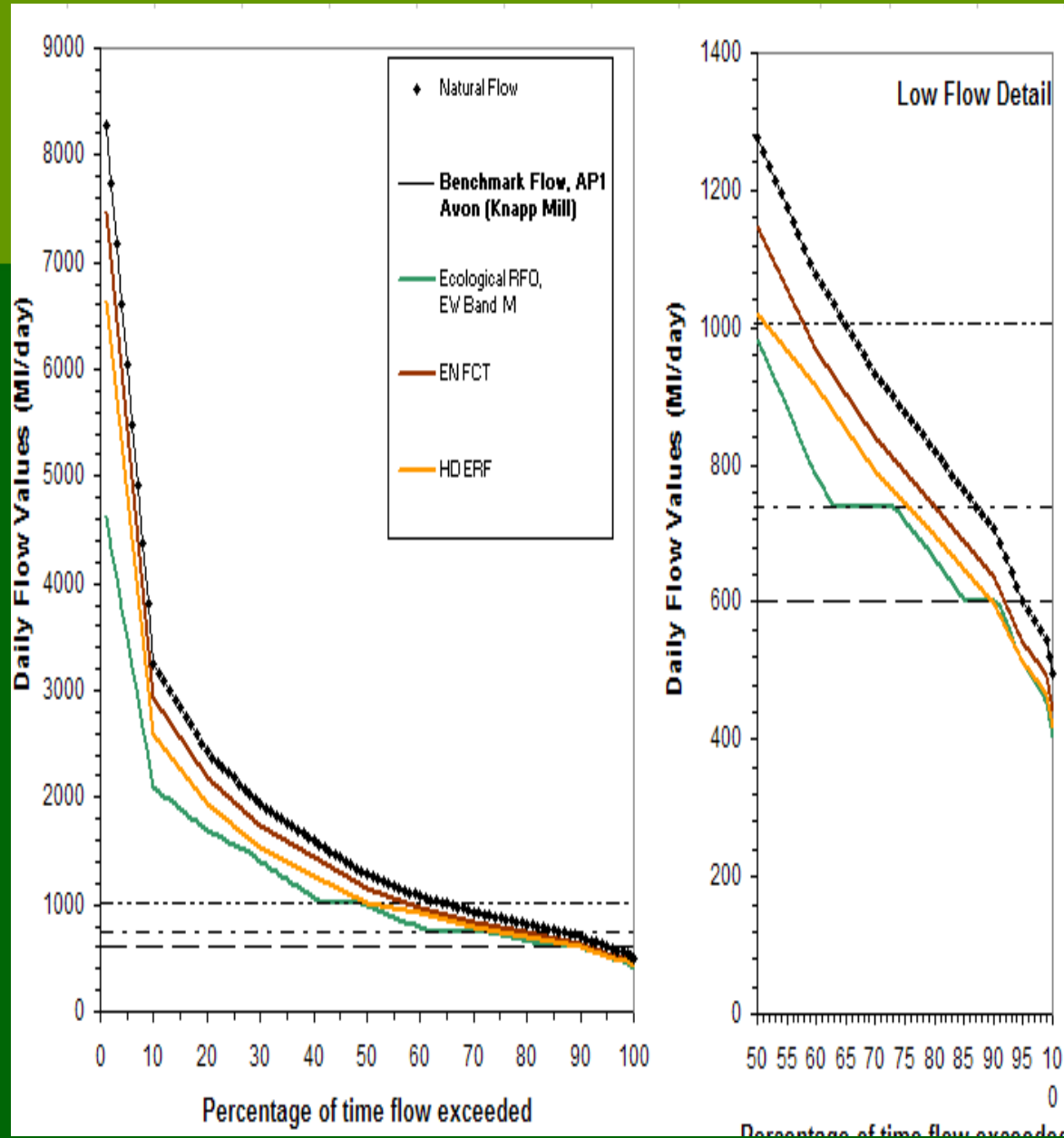


mean RAM score

Abstraction sensitivity

5.	Very high (VH)
4.	High (H)
3.	Moderate (M)
2.	Low (L)
1.	Very Low (VL)

EW Band	UNC (% of Q95)	INT between thresholds for variability			TAKE (% of INT)
		1	2	3	
VH	1-5	0.2	0.3	0.5	15%
H	5-10	0.2	0.3	0.6	25%
M	10-15	0.2	0.4	0.7	50%
L	15-25	0.2	0.5	0.8	75%
VL	25-30	0.3	0.6	0.9	75%
Other	?	?	?	?	?



Example 1

Very high sensitivity
to abstraction

If '*very high*' (VH) sensitivity then more water is allocated to protect the in-river ecology and a smaller proportion is allocated for abstraction.



TOTAL RESOURCE

Water allocated for abstraction

Water allocated for the environment

Example 2

Very low sensitivity
to abstraction

If '*very low*' (VL) sensitivity then less water is allocated to the in-river ecology and a larger proportion is allocated for abstraction.



TOTAL RESOURCE

Water allocated for abstraction

Water allocated for the environment

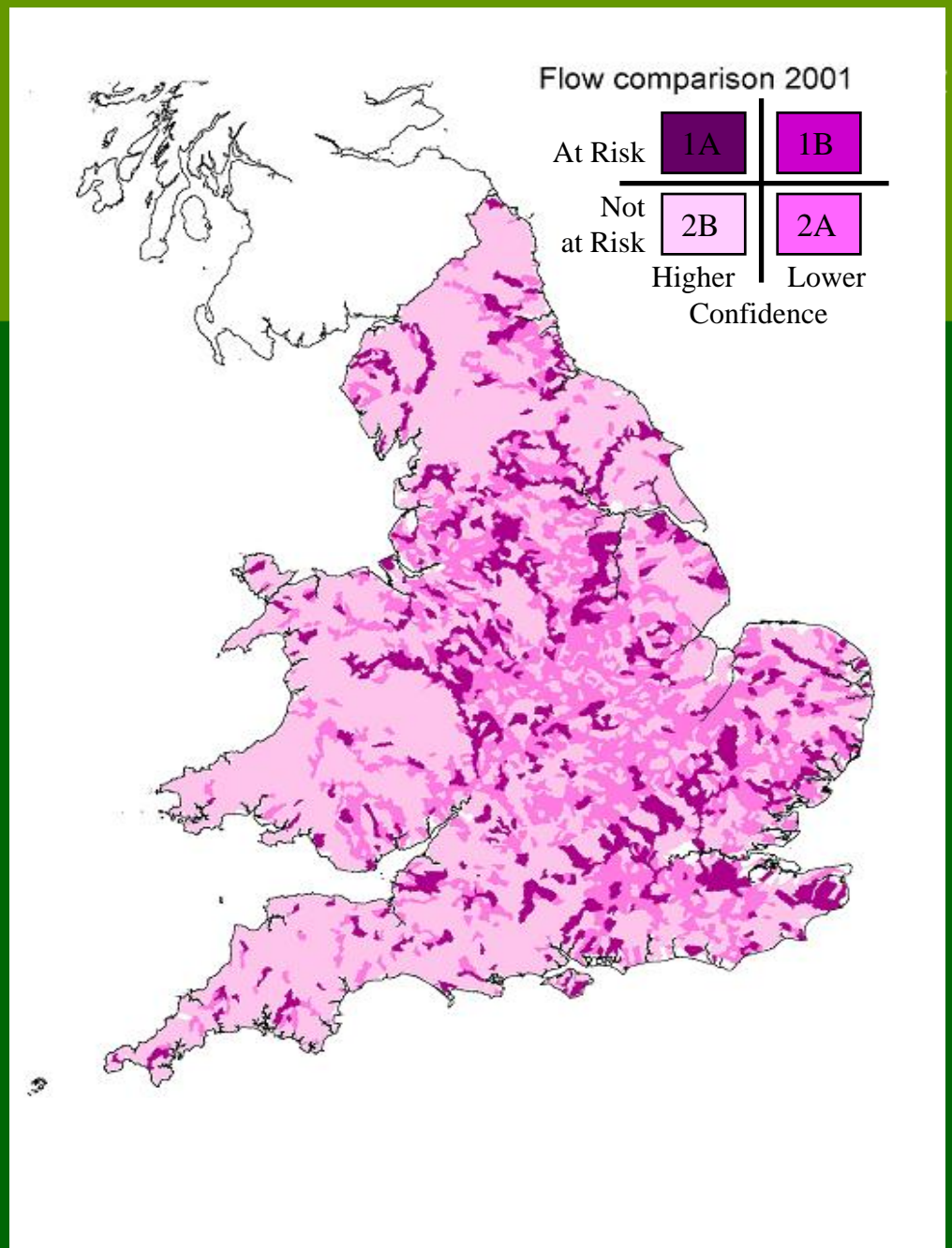
Can we afford to be complacent about the use of RAM river flow standards?

Review of the Effectiveness of RAM flow standards

RAM results from 2001 to date includes a comparison of:

- Observed ecology.....from macrophyte, invertebrate samples with
- Expected ecology.....under conditions of no abstraction.

WFD Initial Characterisation: Pressures on river flows



WFD Initial Characterisation maps

- 09 Effectiveness of existing flow standards?
- 09 Scale... how do the 1,000 RAM assessment points relate to 6,000 WFD river water bodies?

UKTAG: Report WFD 48

Development of Environmental Standards

supports RAM approach....but includes:

- σ UK wide approach..... EA, SEPA, DoENI
- σ water body scale.....8,000+ river stretches
- σ use of wider expert opinion in setting flow standards

Need for standards for other WFD water bodies

- 09 Lakes.....levels or flows?
- 09 Estuaries.....freshwater flows to tide
- 09 Minor aquifers
- 09 Wetlands...esp. groundwater fed
- 09 HMWB....reservoirs & water transfers

Review of RAM environmental standards to meet WFD requirements

- 09 modification where necessary
- 09 consideration of all water bodies

RAM II river flow standards for use in 2nd cycle of CAMs 2007-2013.