

Eel Regulation and Low-Head Hydropower

What happens when new regulations and guidance are enforced without consultation or robust supporting evidence

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EU Eel Directive 2007

- “measures for the recovery of the European eel”
- at least 40% of the potential production of adult eels should be returning to the sea to spawn

UK Eel Regulations 2009 (England & Wales)

Measures that require (by 2015):

- **the installation of eel-passes at obstructions**
(*“at costs of the order £100 - £1000”*)

and

- **screens at abstraction and discharge points**

“The impact on businesses will be minimised by prioritising those obstructions and abstraction/discharge points that are critical to the passage of eels”

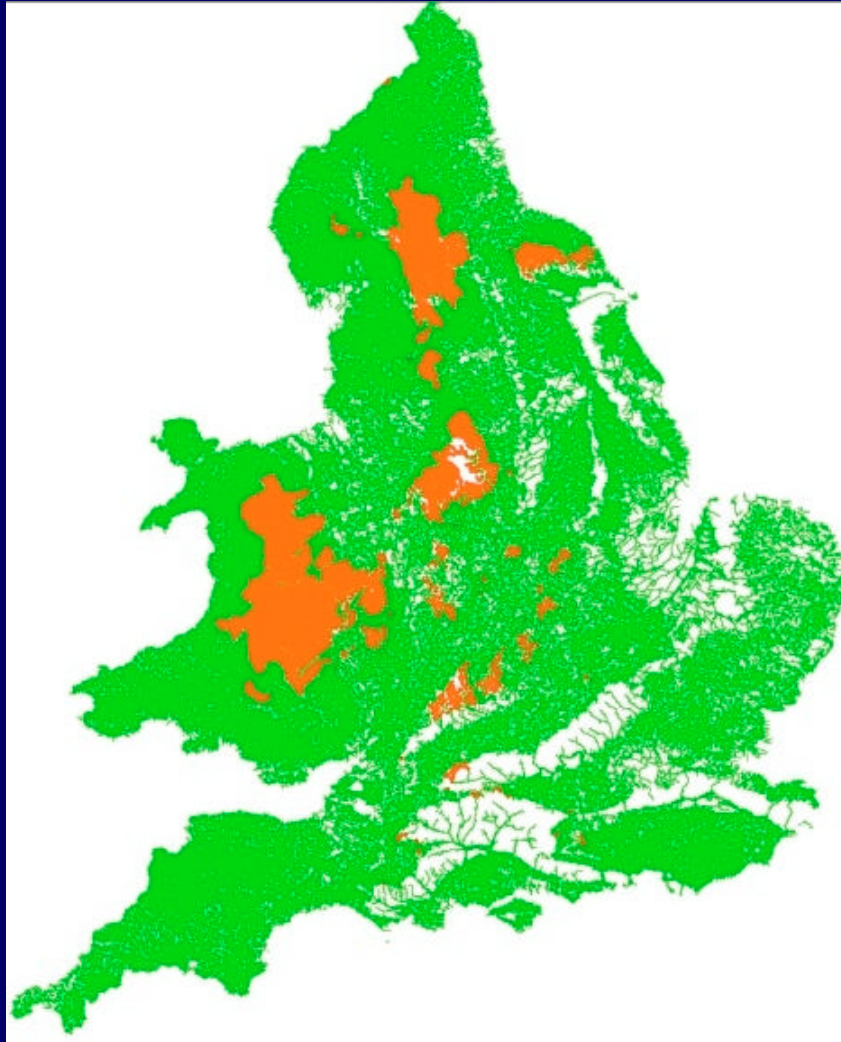
Eel Manual 2011

Screening at intakes and outfalls: measures to protect eel

- **Issued without industry consultation**

Eel life stage (minimum size protected)	Mesh size/bar spacing for exclusion (mm)	
	Screen angle $\Phi > 20$ deg	Screen angle $\Phi \leq 20$ deg
Elver/glass eel	1-2*	1-2*
Yellow (14cm)	3	3
Yellow/silver eel (30 cm)	9	12.5
Silver eel (50cm)	15	20

Eel Risk Map



Derwent *HYDRO*

Big Problem for:

- Existing or proposed

low-head Francis, Kaplan, or Crossflow projects

within 30km of the Tidal limit

- 2mm screening required

BHA Questions to the EA

- **What is the evidence base to justify 2mm screening ?**
- **Where are the dead juvenile eels ?**
 - **Do upstream migrants move downstream into hydropower intakes in significant numbers ?**
 - **Are they deterred by an existing screen that they don't have to go through ?**
 - **Are they actually damaged by a Francis or Kaplan turbine?**

EA Responses

- **Some juvenile eels may move downstream, so could be in danger**
- **Eels are weak swimmers, so might not be able to swim away**
- **Knights (1982) measured the skulls of farmed juvenile eels hence 2mm aperture**
- **Eels in a bucket can drop through small holes in a perforated plate**
- **You're unlikely to find evidence of dead eels once they've passed through a turbine**
(Do they evaporate, dissolve or combust ??)
- **er... the precautionary principle...er...**

EA Evidence Review 2016 #1

A rapid review of evidence underpinning the eel guidance

Conclusions:

- *"This rapid review found little evidence in the referenced literature to our eel screening guidance for damage / mortality of elver and small yellow eel in HEP turbines*
- *or even for entrainment of these groups in installations in the first place."*
- *"We found no records in our National Incident Reporting System (NIRS) of damage to fish or eels directly from HEP installations"*

EA Evidence Review 2016 #2

Screening for small eels at hydropower sites: A review of evidence and gaps

“The principal evidence gaps identified are:

- *the magnitude of downstream movements by small eels,*
- *the effectiveness of behaviour exclusion for small eels at existing screens,*
- *the mortality rate suffered by small eels entrained in turbines*
- *a fundamental lack of understanding about eel population dynamics”*

Appeal : Itteringham Mill

- Propeller turbine with 20mm screen
- Operating since 2006 with no issues or complaints
- New abstraction license - must implement 12mm screen (by 2017) then 2mm screen (by 2021); an eelpass would also be required.



Appeal Conclusions

- 2mm screening is not reasonable or necessary
- No evidence of eel entrainment
- It was not “disproportionate & unreasonable” to expect the EA to obtain such evidence
- No evidence that the scheme was other than “low risk”
- Increased cost and maintenance for 2mm screens not justifiable for no known benefit
- EA’s claimed benefit-cost ratio of 83 dismissed as unsubstantiated
- However the requirements to install a 12mm screen and an eelpass were upheld.

IN CONCLUSION

- **There is no evidence to support the EA's eel-screening guidance for juvenile eels.**
- **Always ask for the evidence-base behind a regulatory decision.**
- **Appeal inspectors will focus on tangible evidence, reasonableness, and cost-benefit**
- **Hiding behind the Precautionary Principle is not compatible with “achieving sustainable development”**
- **Regulation without consultation leads to bad regulation**