River continuity in Europe

from Broken Rivers to Free-Flowing Rivers

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& the AMBER consortium

AMBER
LET IT FLOW

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Europe's Freshwater Fishes and the Biodiversity Strategy Targets
24-25 November 2022 – Brussels

Europe has some of the most endangered freshwater fish in the world…

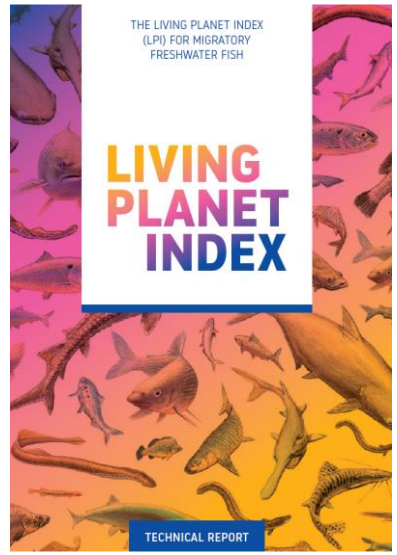
Terrestrial mammals -25%

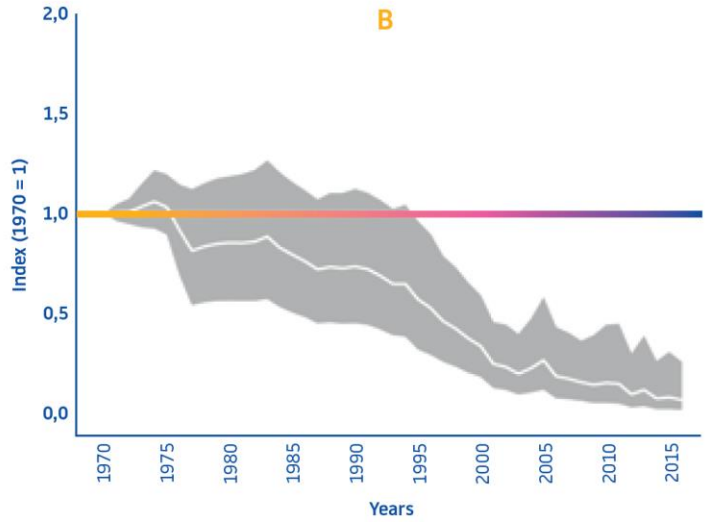
Marine fish -20%

Freshwater fish -65%

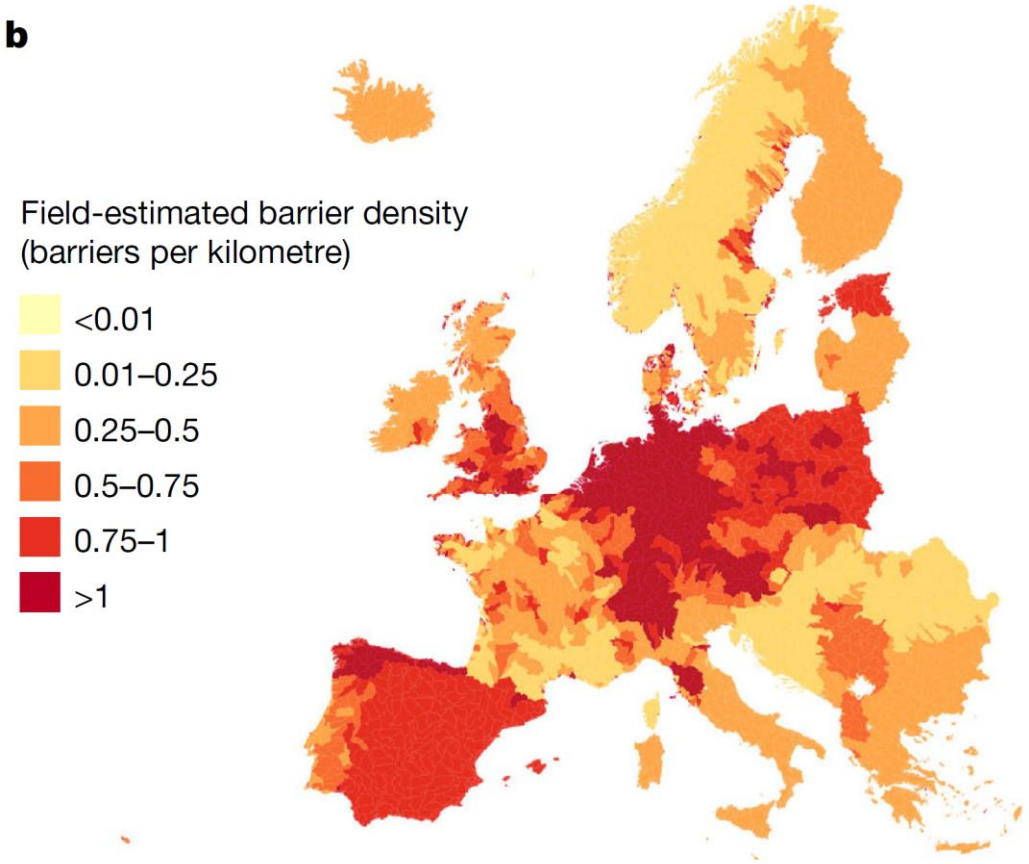
Freshwater migratory fish -76%

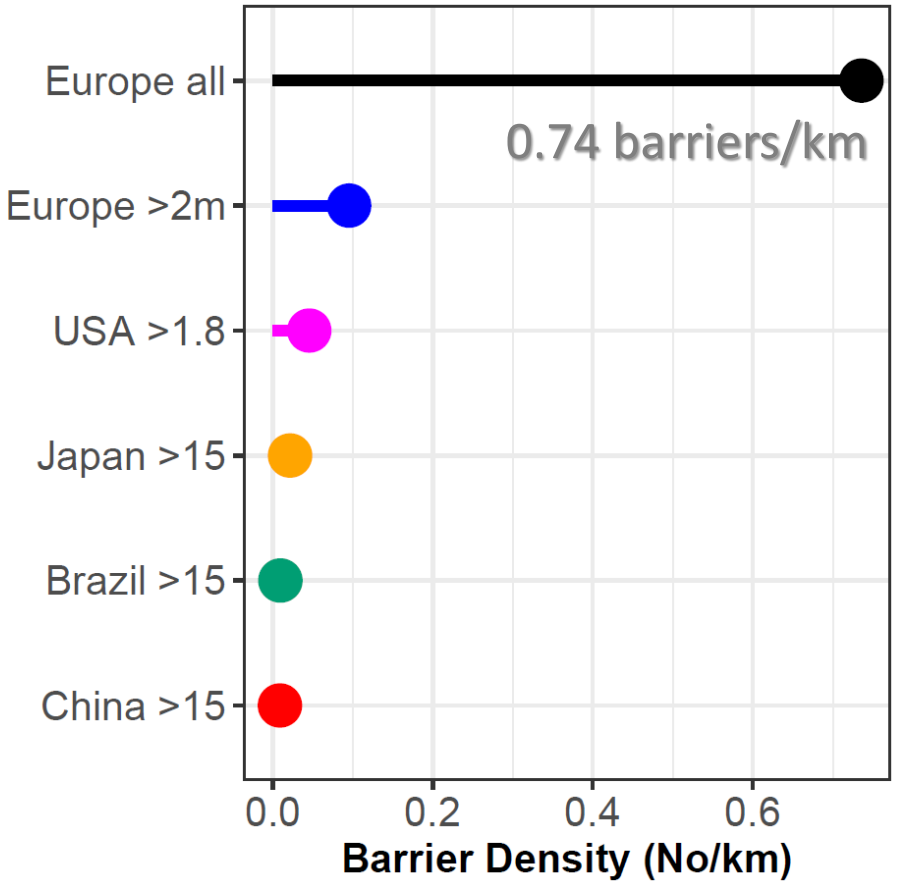
FW migratory fish in Europe -93%





..probably because it has some of the most fragmented rivers……





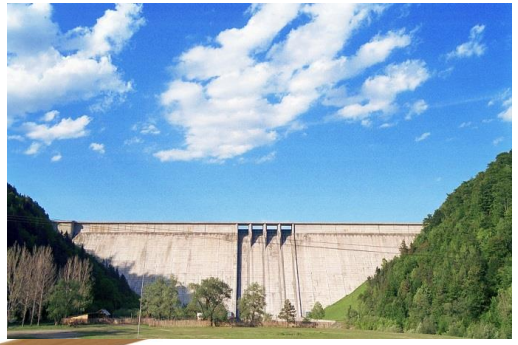
+1.2M barriers

Belletti et al (2020) *Nature*

We have been abstracting water for milenia...

Roman Aqueduct (Segovia, Spain)

0.1%



99.9%

dams are NOT our biggest problem….

In rivers [H] extinction is spelled with

H

Barriers

Habitat loss

Habitat degradation

Harvesting

[H]invasive sp

Heat

In rivers [H] extinction is spelled with

...but so is

ope

7 reasons to be cheerful

The biggest problem is not what we don't know, but what we *don't know we don't know*

Donald Rumsfeld
US Secretary of Defense

[the *unknown unknowns*]

1

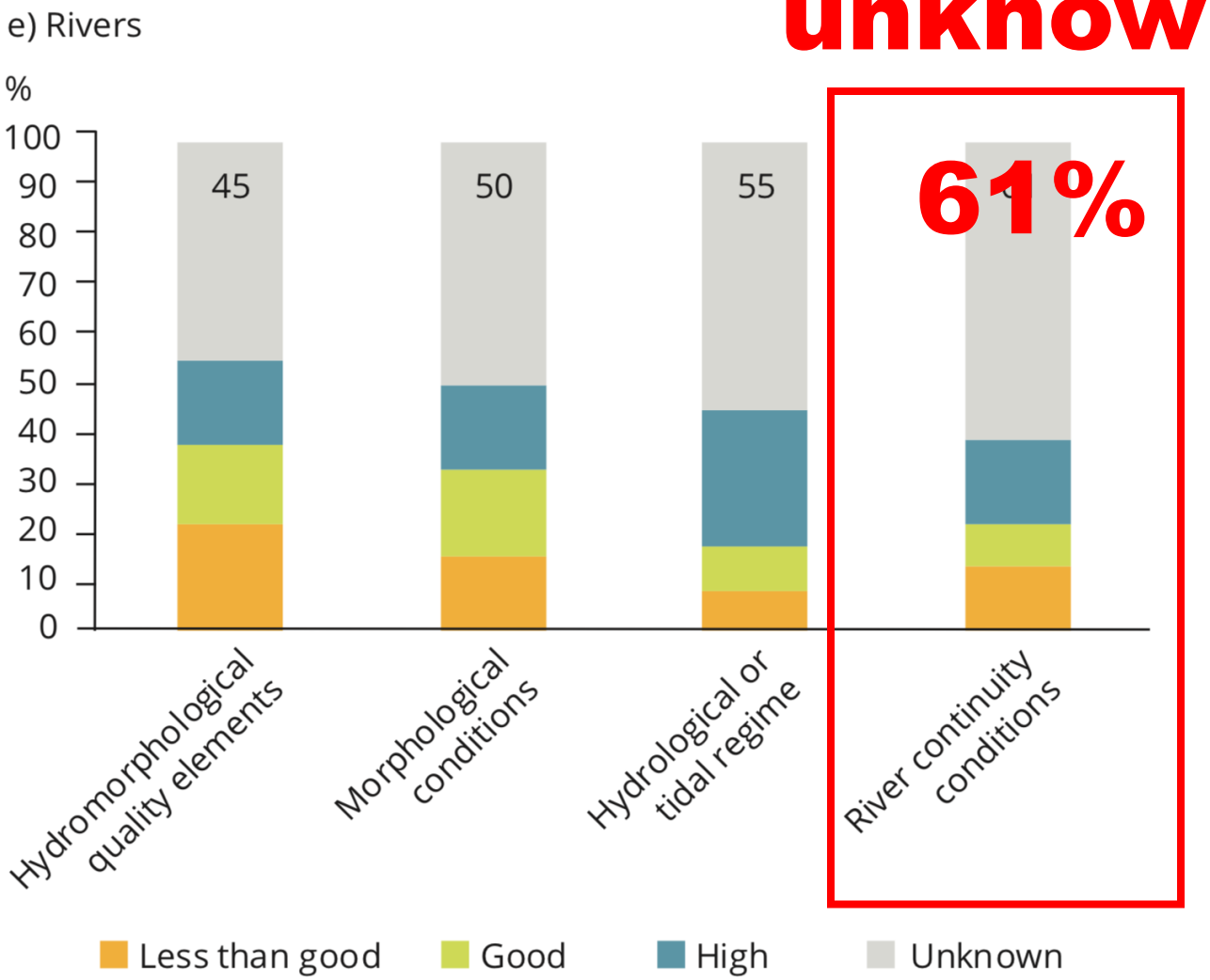
We know more...

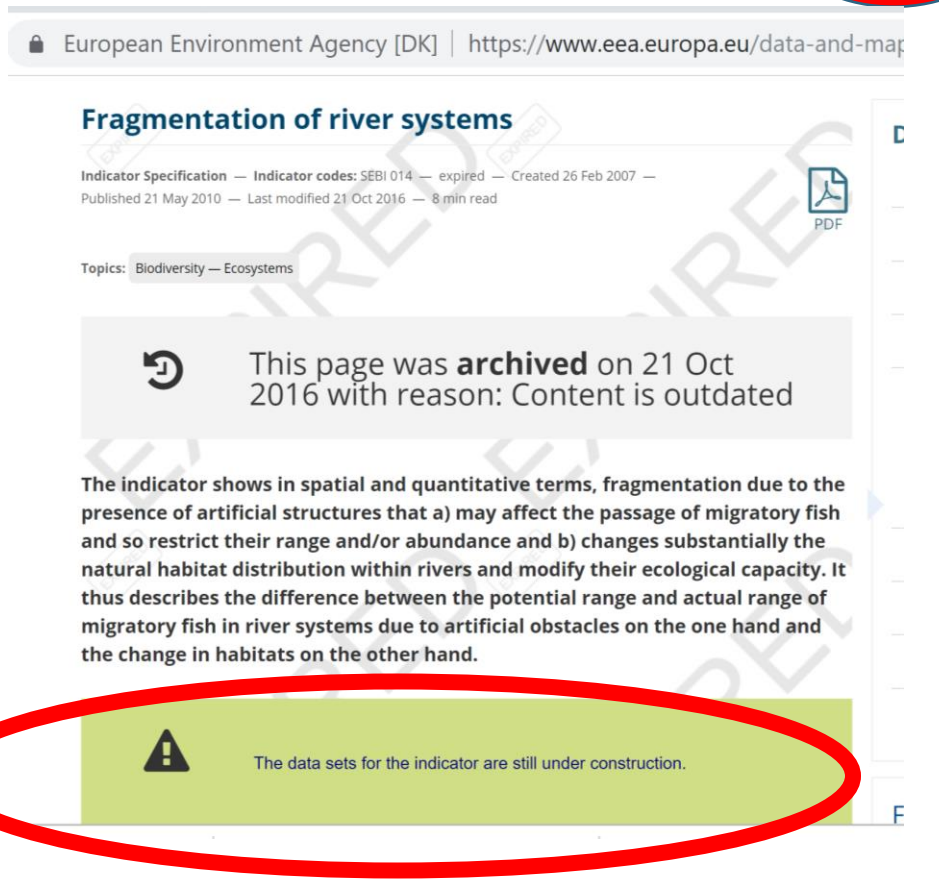
(including key unknowns)

River Continuity conditions

2018

unknown





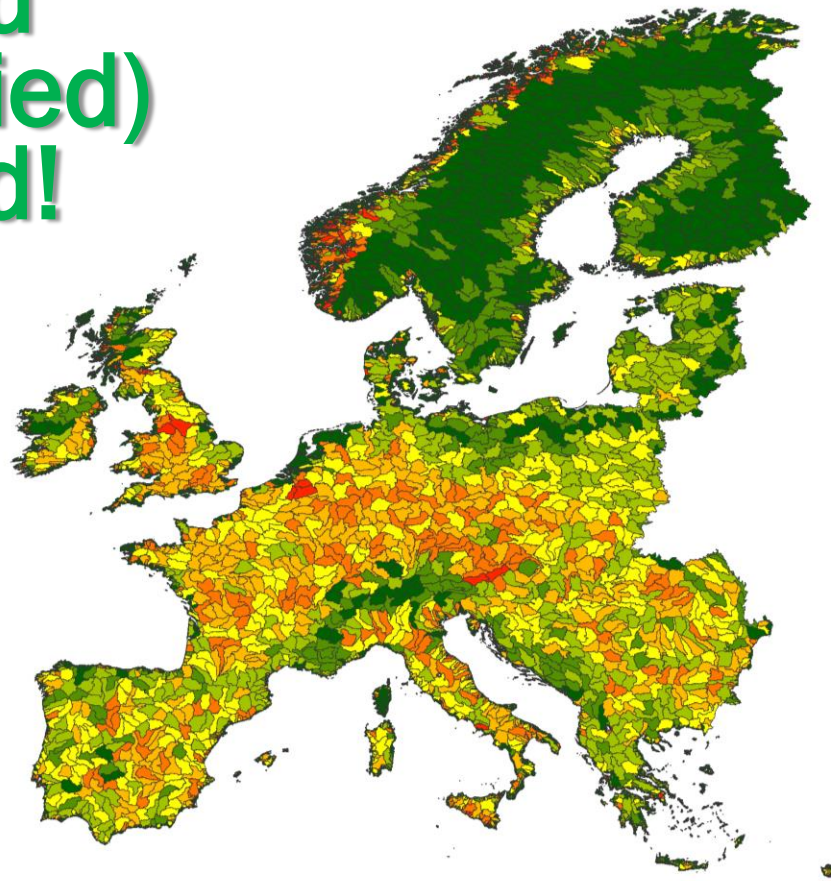
EEA (2018). European waters - Assessment of pressures and status. EEA Report 7/2018 ISSN 1977-8449

The first Barrier Atlas of Europe

2020

Most fragmented (but also best studied) rivers in the world!

+1.2M barriers



700K database

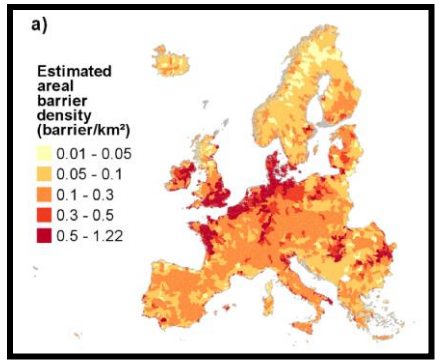
600K missing!

AMBER

nature
International weekly journal of science

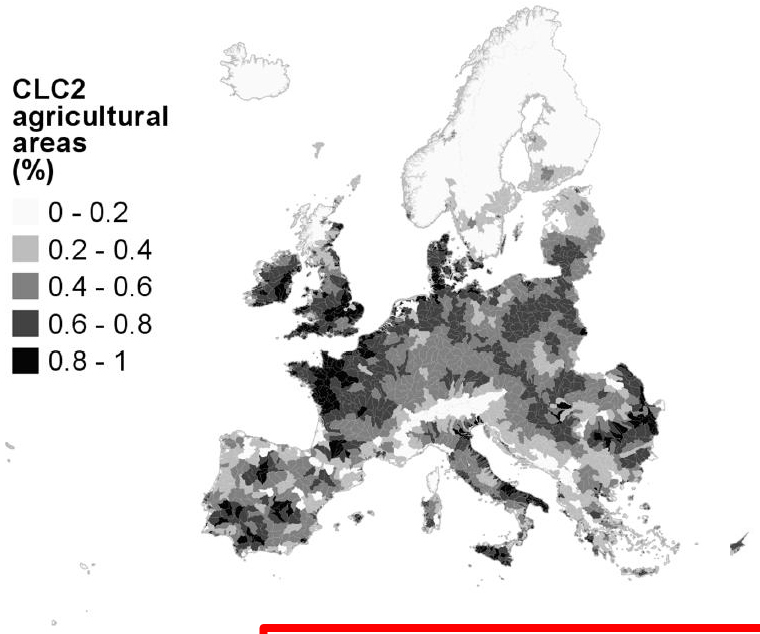
Belletti et al (2020) *Nature*

Drivers of river fragmentation

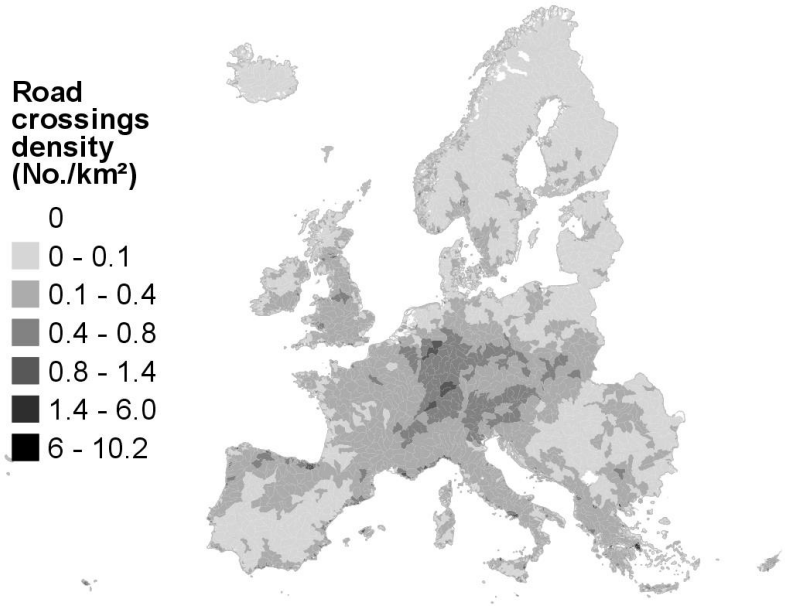


Belletti et al (2020)

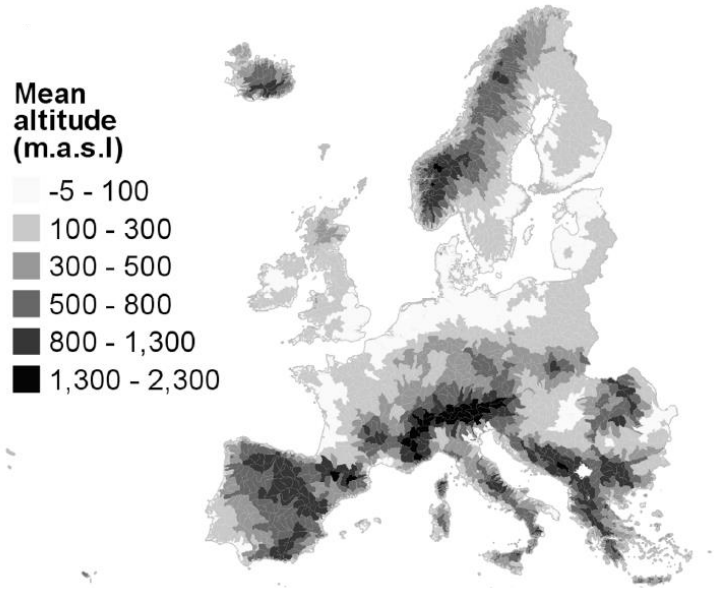
Agriculture



Roads



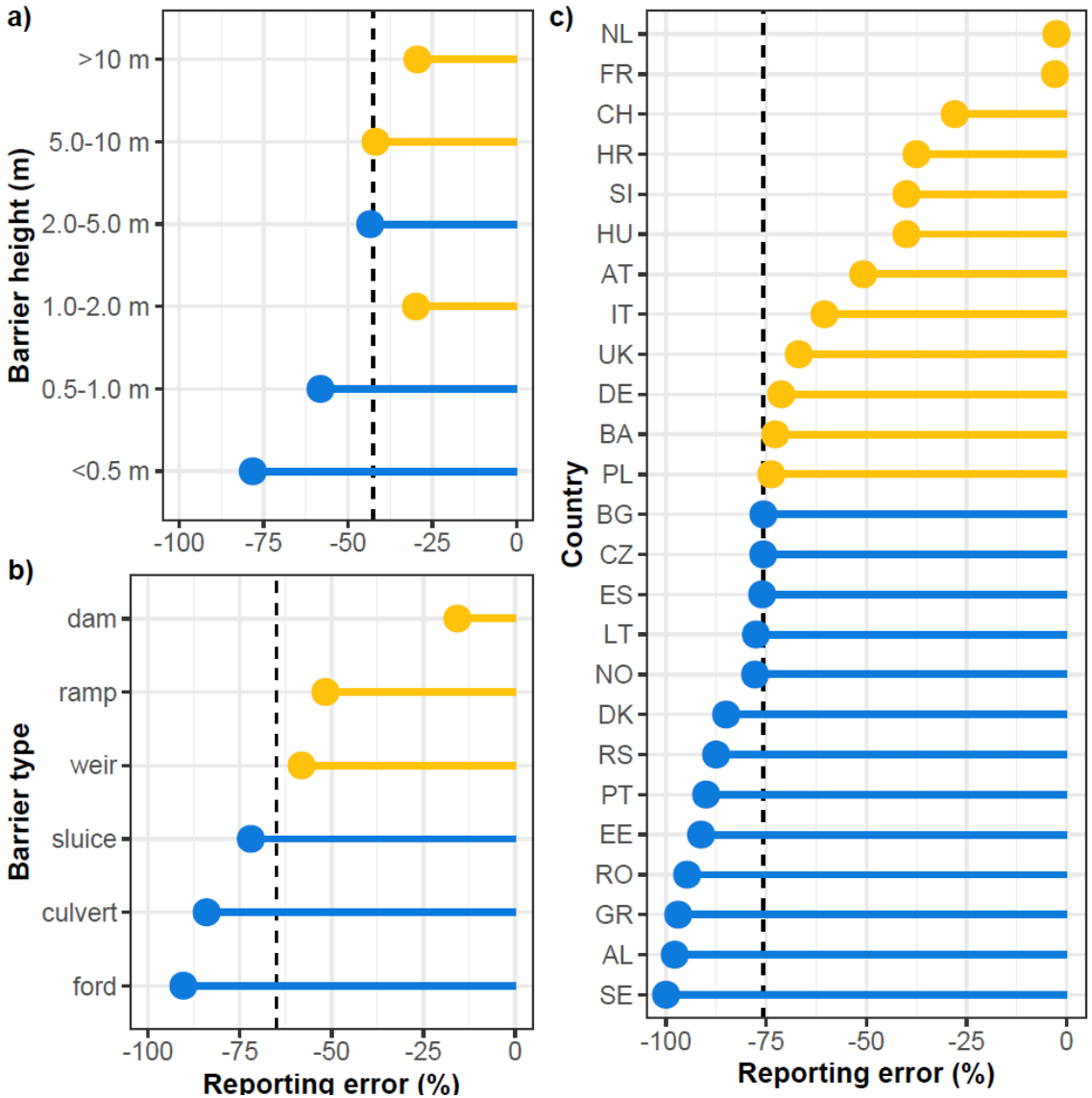
Altitude



Fragmentation largely mirrors other anthropogenic pressures on rivers

The known unknowns…

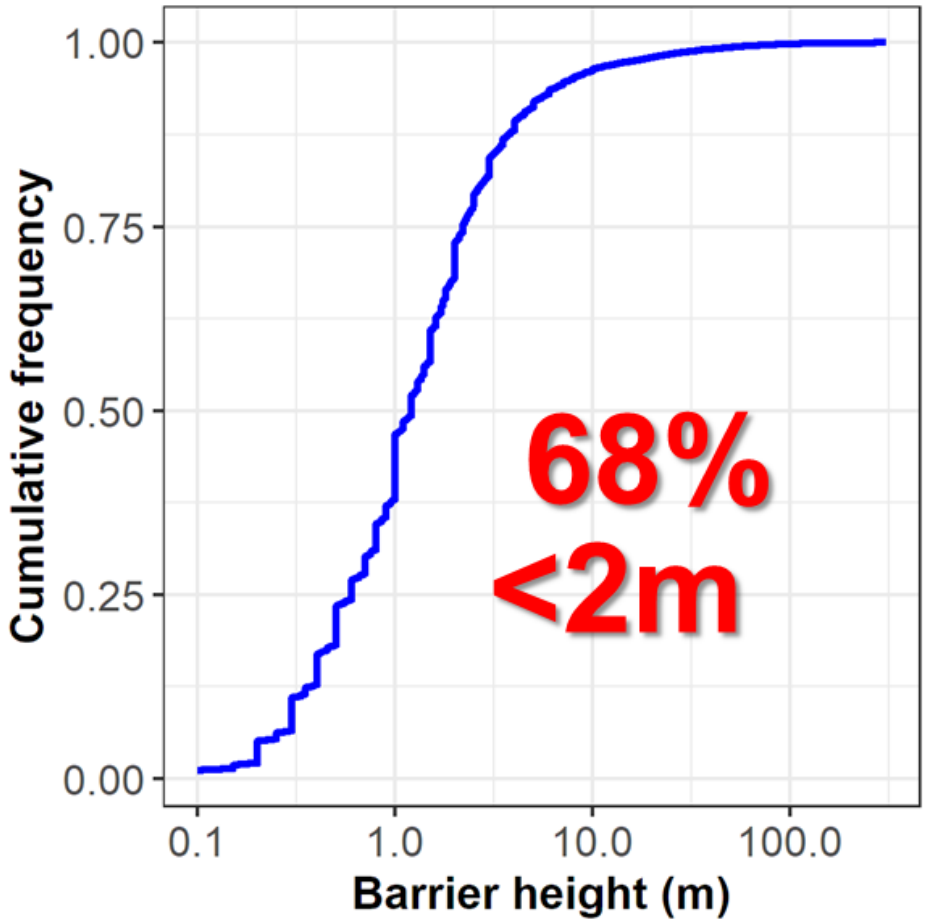
Belletti et al (2020) *Nature*

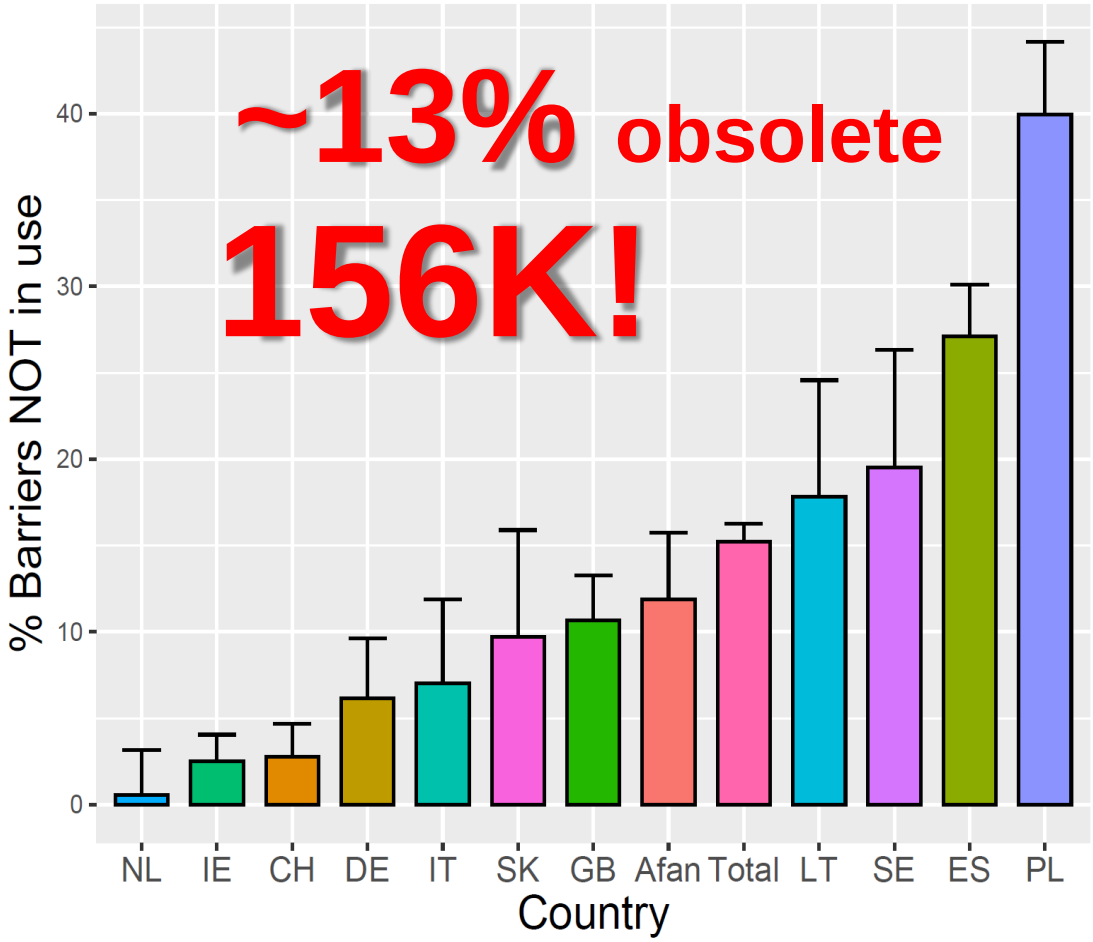


…we know *where* most of the missing barriers are

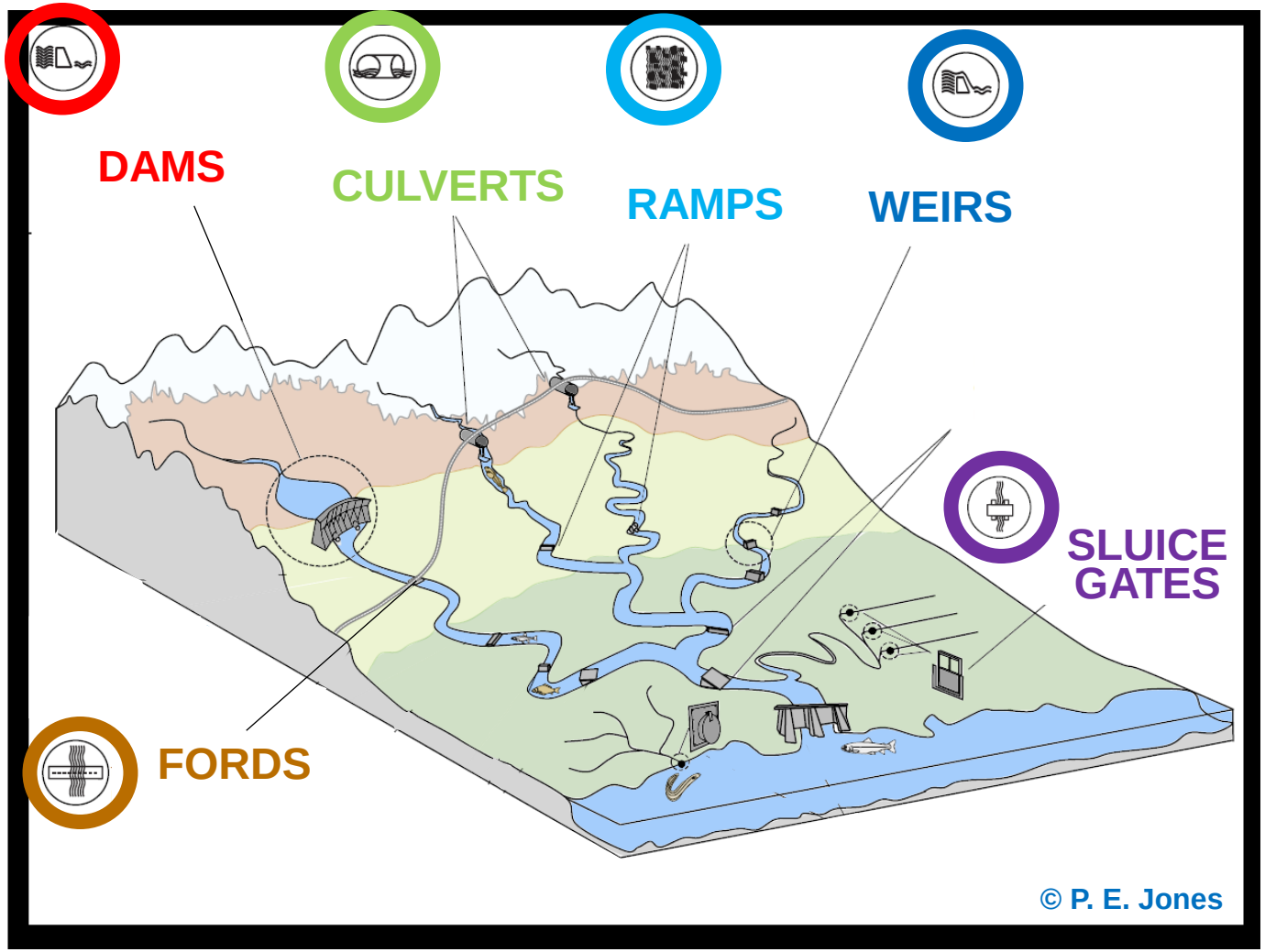
….and also *what type* they are

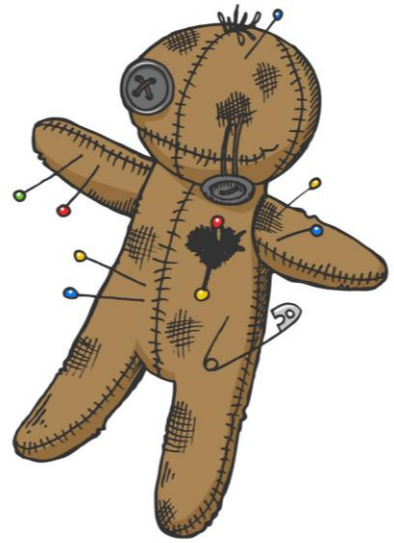
2 Most barriers are small, many obsolete





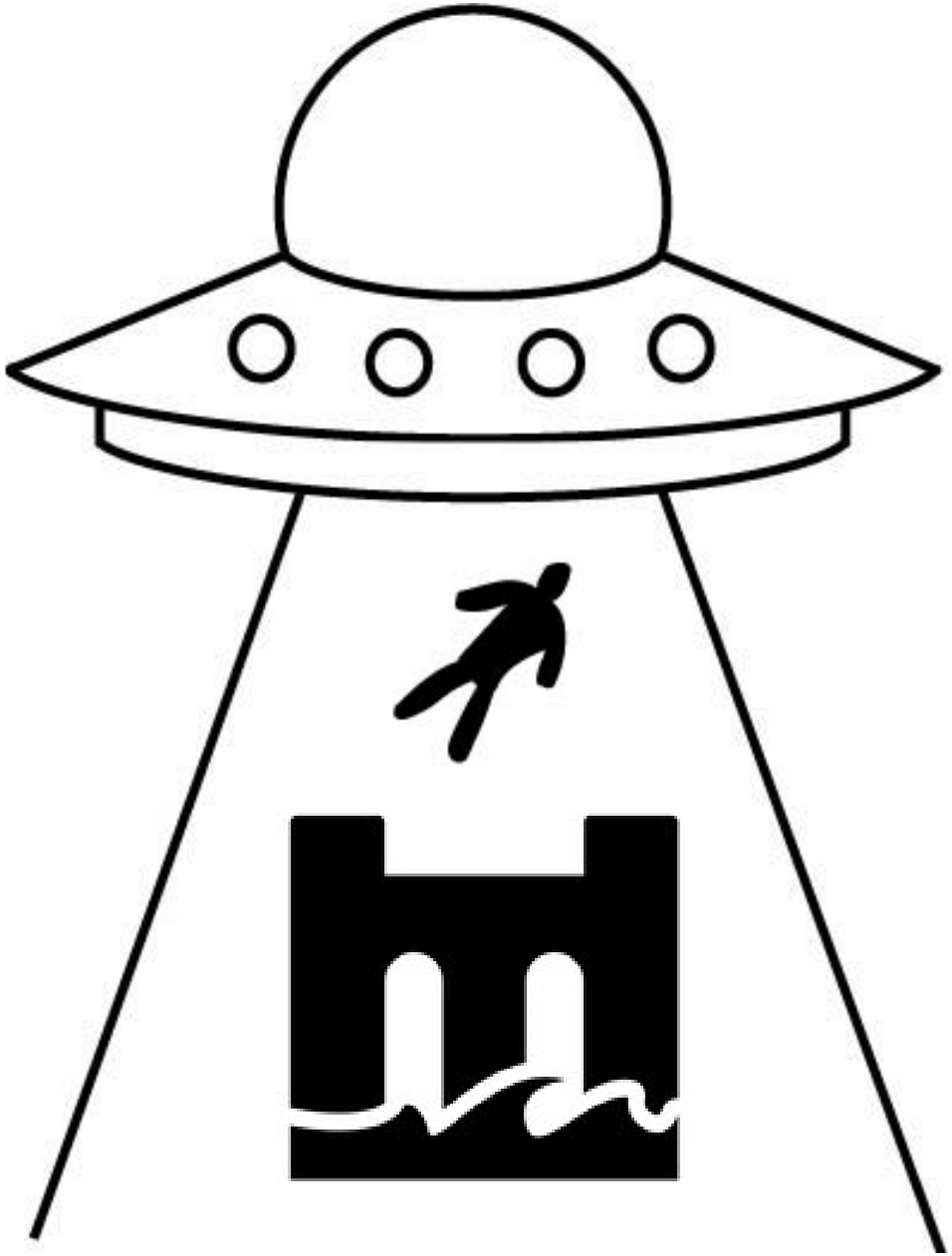
Death by a thousand cuts





Large dams get the attention...,

Small (unreported) barriers do most of the damage

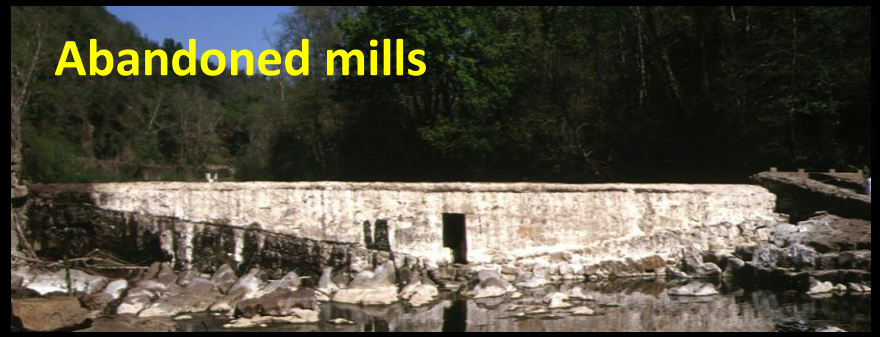


Unwanted

Fluvial

Objects

3 We know who the worst UFOs are...



4 ...this offers unprecedented opportunities for restoration

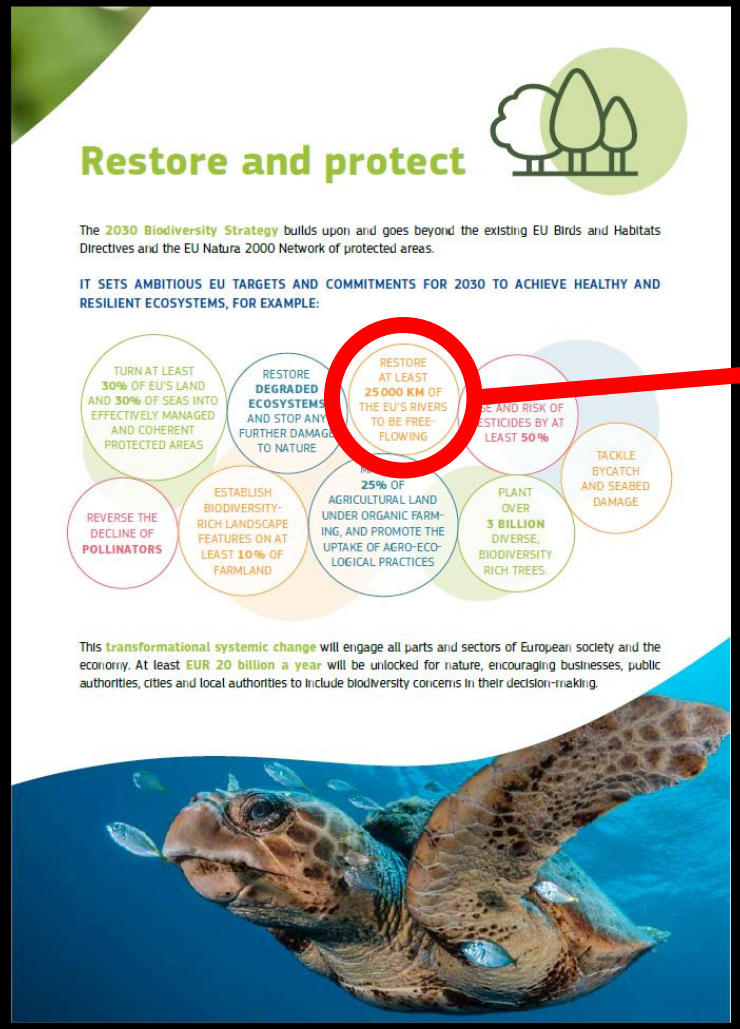
STOP fragmenting

+

Reconnecting

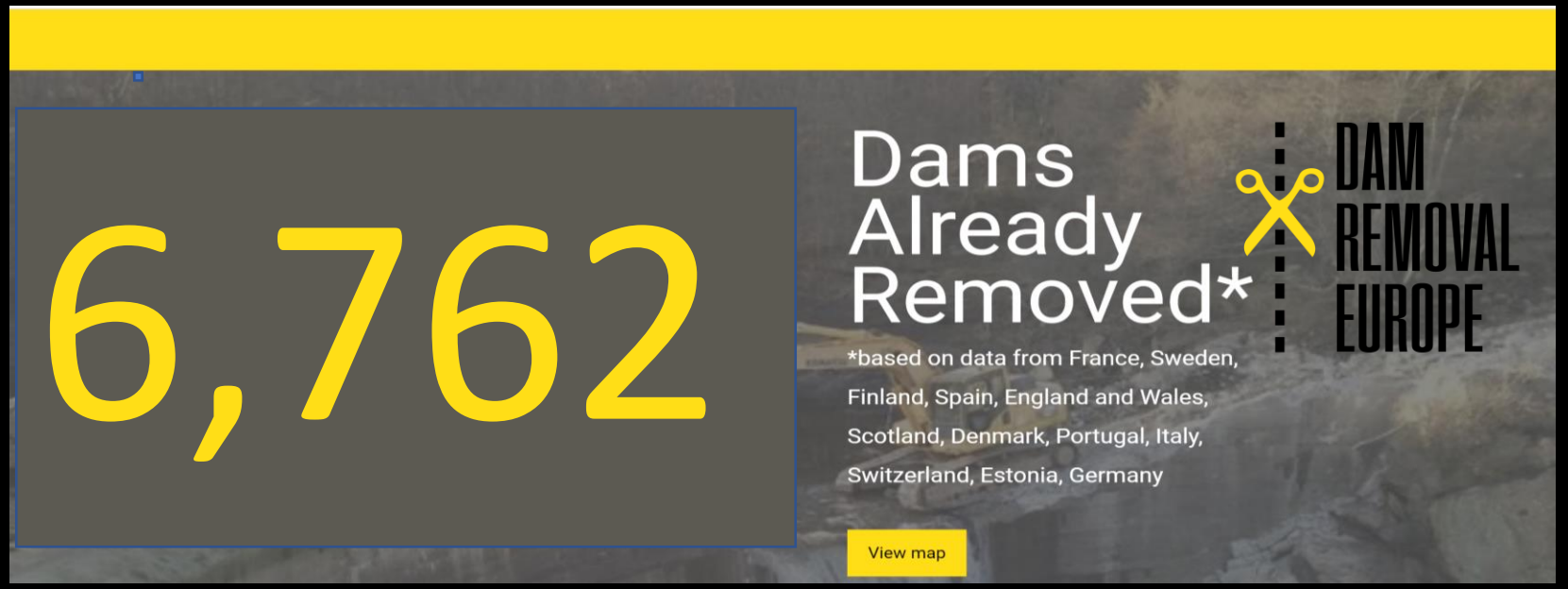
Targeting small UFOs is cheaper & socially more acceptable

5 ...we now have the legal instruments



Restore at least **25 000 km** of EU's rivers to be free-flowing by 2030

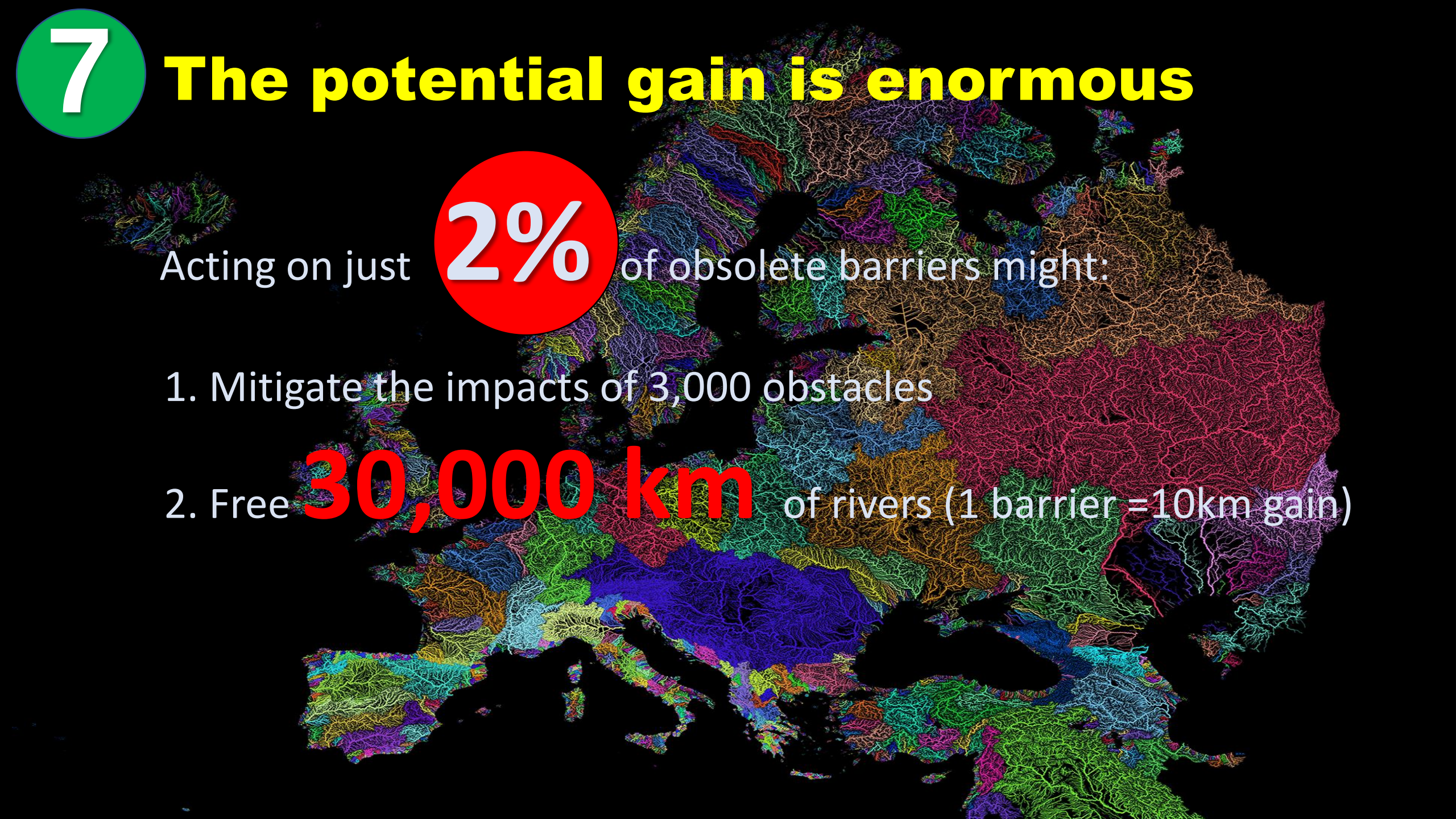
6 Barrier removal is becoming mainstream



OPEN RIVERS PROGRAMME

€42.5M

7 The potential gain is enormous



Acting on just **2%** of obsolete barriers might:

1. Mitigate the impacts of 3,000 obstacles
2. Free **30,000 km** of rivers (1 barrier =10km gain)

IMAGINE

when the barriers are gone

1. [Some] rivers without walls, tubes or fences

2. …with more plants, fish and water

3. Better rivers than we had ever known before…


Many thanks
Any Questions?