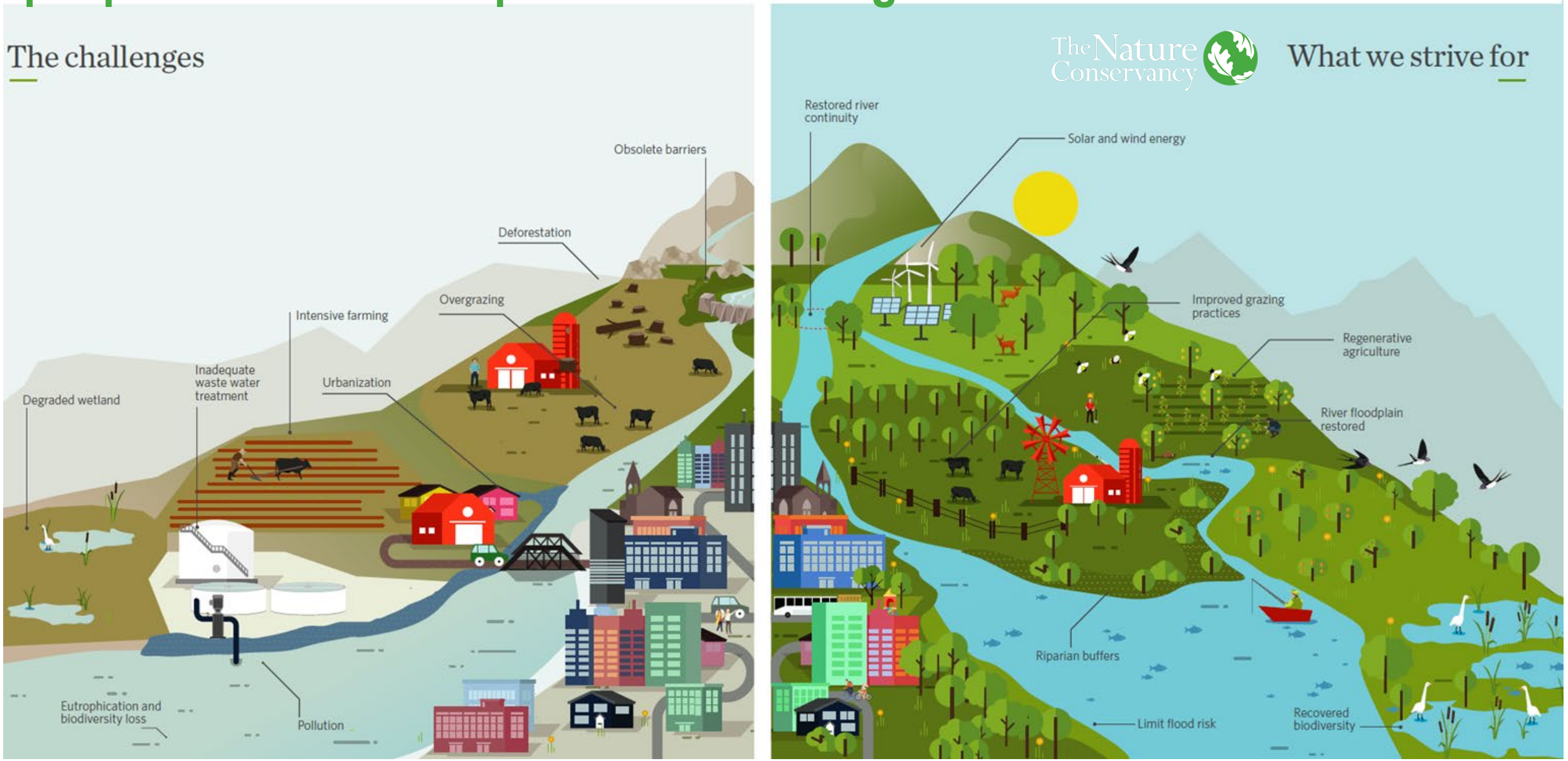
Nature-based solutions at scale to address nonpoint source water pollution: France & England

Sophie Trémolet, The Nature Conservancy, 16th October 2023

TNC's vision for freshwater: restore and protect biodiversity, help people and nature adapt to climate change



Nature-based Solutions are "actions to **protect**, **sustainably manage** and **restore natural** or **modified ecosystems**, that **address societal challenges** effectively and adaptively, simultaneously **providing human well-being and biodiversity benefits**"
(IUCN, 2016)

NbS types for water security

	Examples
 **Protection** is an intervention that prevents, or greatly limits, overexploitation of natural resources to achieve the long-term conservation of nature.	National park designation, fencing, support for park guards
 **Restoration** is an active or passive intervention that involves returning degraded, damaged or destroyed ecosystems to pre-disturbance state.	Reforestation, grassland revegetation, riparian restoration, wetlands restoration, floodplain restoration, invasive species removal, barrier removal
 **Management** covers all natural resource management interventions beyond protection and restoration.	Agricultural best management practices, ranching best management practices, forestry best management practices, fire management
 **Creation** involves the establishment, protection or management of artificial ecosystems.	Artificial grasslands, created wetlands (not restored), urban green infrastructure (SUDS, bioswales, natural retention ponds)

NbS can improve water security & generate multiple co-benefits

WATER SECURITY

1. **Maintain or improve water quality**
2. **Maintain or improve river flows and aquifer recharge**
3. **Reduce impact of flooding**

CLIMATE CHANGE MITIGATION

1. Reduce greenhouse gases emissions
2. Carbon sequestration

CLIMATE CHANGE ADAPTATION

1. Reduce soil erosion
2. Soil quality improvement
3. Reduce frequency and intensity of forest fires, floodings and droughts

HUMAN HEALTH AND WELL-BEING

1. Improve food security
2. Reduce exposure to polluting substances
3. Amenity value and recreational benefits

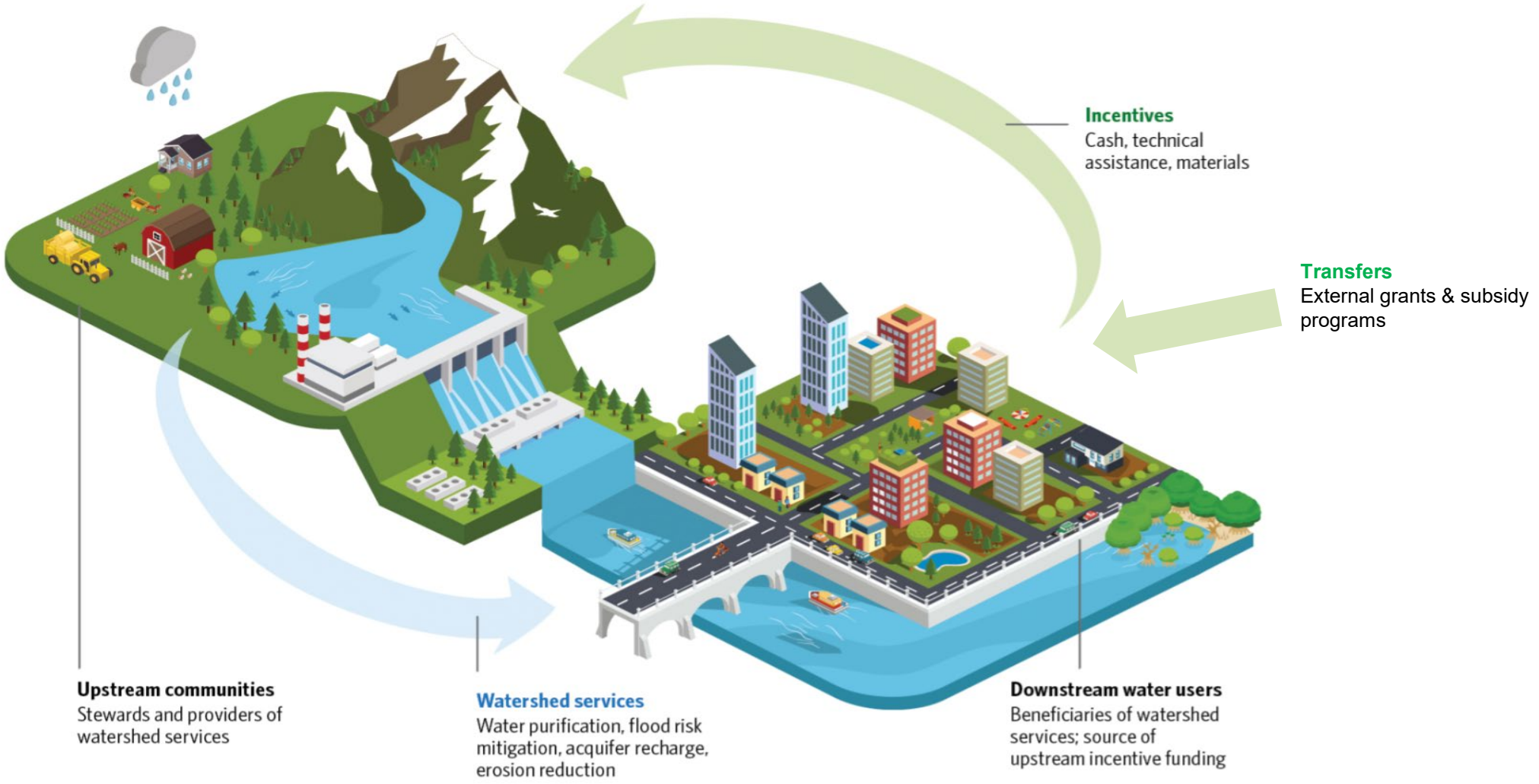
BIODIVERSITY CONSERVATION

1. Landscape diversity
2. Protect and expand natural habitat
3. Limit expansion of invasive species

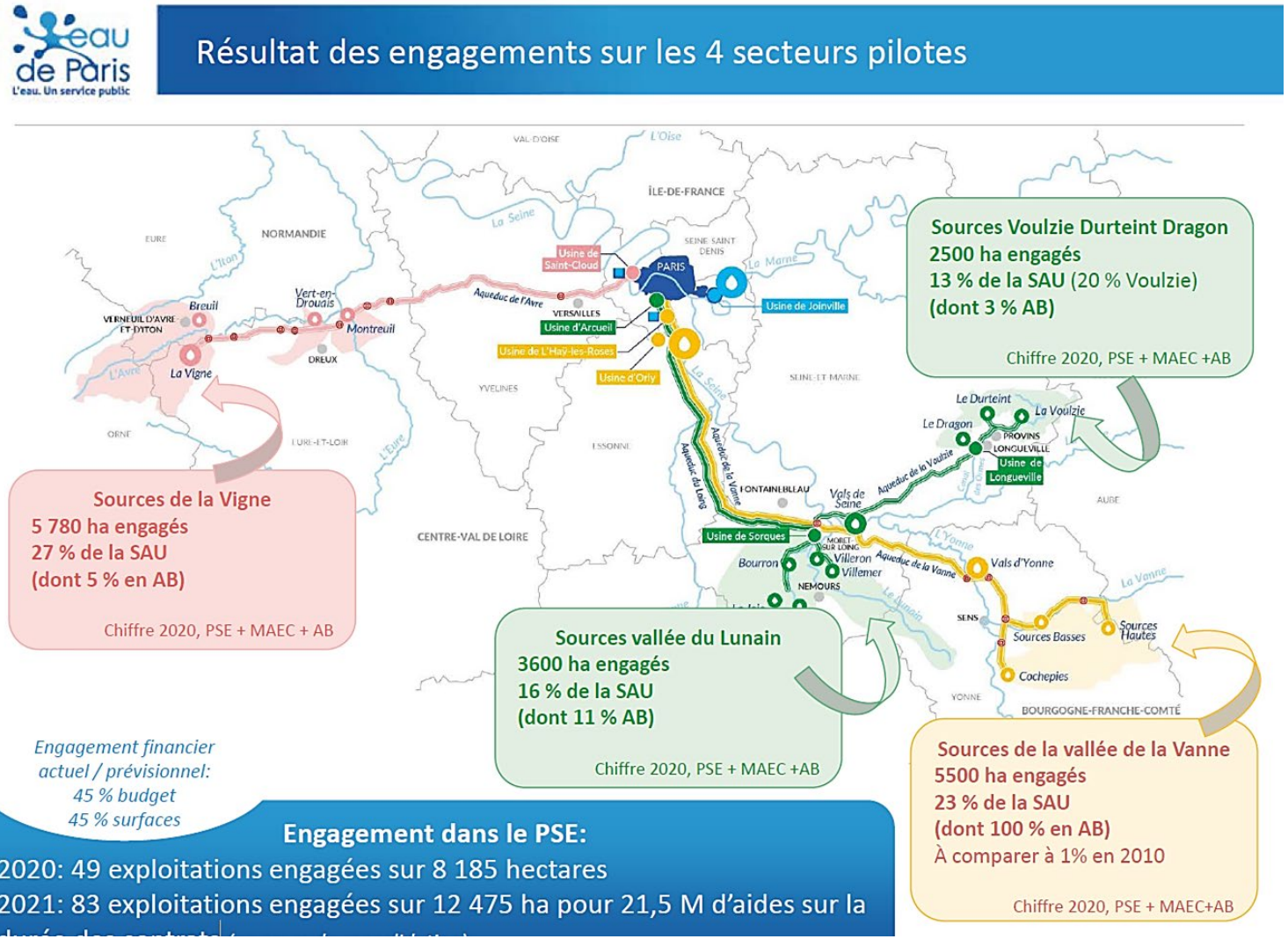
JOBS AND SOCIAL COHESION

1. Create jobs particularly in rural areas
2. Promote urban-rural solidarity

Mobilising funding from downstream beneficiaries can be essential to support investment upstream in the watershed



NbS for drinking water quality: Eau de Paris



Production and distribution of drinking water to 3 million people in Paris *intra-muros.* Production from spring water catchments (located up to 150 km from Paris, transported to Paris by 470kms of aqueducts) and treated surface water in the Paris region (Seine and Marne rivers). Most wells are located in farming areas, affected by diffuse agricultural pollution (nitrates, pesticides)

- **Source water protection programme initiated in 2008**, with objective to change farming practices to protect water supplies
- **NbS implemented**: Improved agricultural practices:
  - Reducing the use of pesticides and fertilizers
  - Conversion of arable land to pasture
  - Land purchases with long-term agreement with farmers

- **Funding:** Was initially reliant on support from River Basin Agencies and PAC subsidies but these were too blunt, not sufficiently targeted and often late
- **In 2020:** obtained the authorisation from European Commission to design and implement own Payment for Ecosystem service scheme

NbS for water security on a regional scale: Norfolk Water Strategy Programme

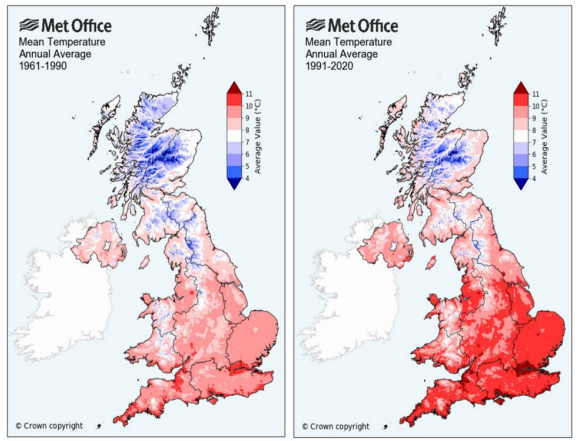
Unique ecosystems and water assets, notably rare chalk streams, lowland peat, heathland, salt marshes and wetlands

Important pressure on water resources already:

- **Water deficit** for agriculture and agriculture supply by 2050;
- **Significant quality issues** from urban and rural runoffs (especially N and P) that impact nature and human activities (housing development is currently on hold);
- **Increasing flooding risk**

Increasing pressures:

- **Climate change**
- **Population growth**



Source: Met Office

Growth 4-17%
(2018-2028)

Wendling Beck : A flagship project transforming farmland management in Norfolk

Ambition

Landscape-scale project to transform **748 ha of farmland by restoring rivers and creating/improving grassland, woodland and other habitats**. It should generate an improvement in the quality of water, soil, air and biodiversity + involvement of local communities.

Revenue streams

Sale of credits for ecosystem services: Biodiversity units sold to local infrastructure developers and the government; other credits: nutrients, carbon, flood risk.
Public subsidies (ELMS, replacing CAP)
Income from organic farming
Philanthropy (incl. TNC)

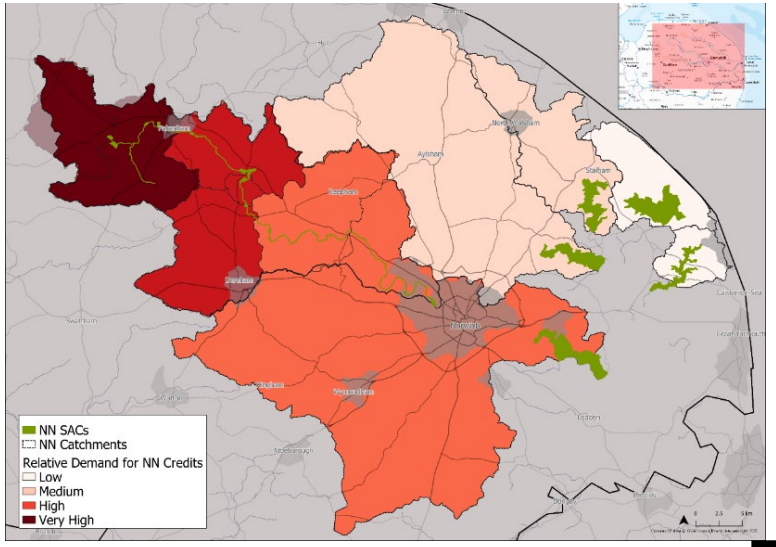
https://www.wendlingbeck.org/

WENDLING BECK

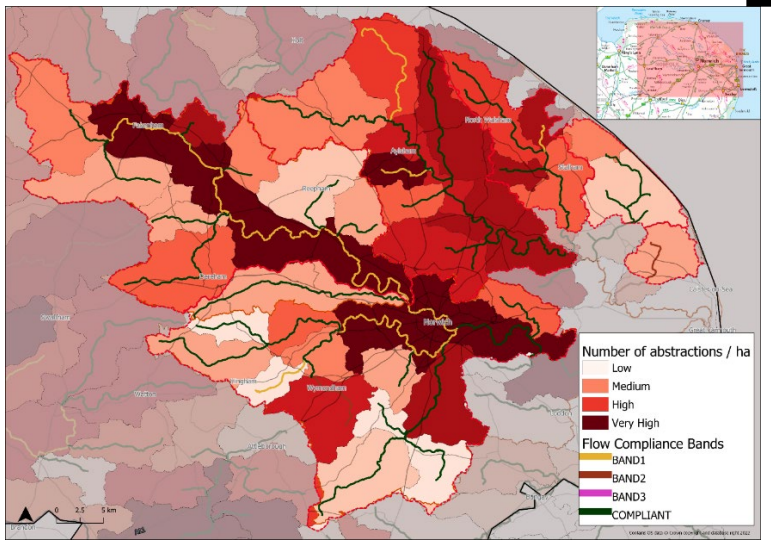
Norfolk Water Fund – identifying potential revenue streams and matching those with project pipeline

NORFOLK WATER STRATEGY PROGRAMME

Nutrient Neutrality £12-25m



Flow Regulation ?



Biodiversity Net Gain £5-10m

Anglian Water (utility) £25m (needs regulatory approval)

Public money £100m+

Philanthropy / CSR £?

Wetlands

Buffer strips

River Restoration

Regen Agriculture

Habitat creation

Runoff attenuation