



**Ministry of Environment  
of Denmark**

Environmental  
Protection Agency

# The Danish take on the WFD in Rivers

The Danish take on the Water  
Framework Directive in Rivers – Water  
Council and Restoration Case Studies

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## Outline

**Statistics – The Danish River Basin Management Plan (RBMP) in numbers**

**The water council**

**Implementation of mitigation methods**

### **Case studies**

- Gudenåen – 4 projects
- Elleskov Water Mill and successful stakeholder engagement





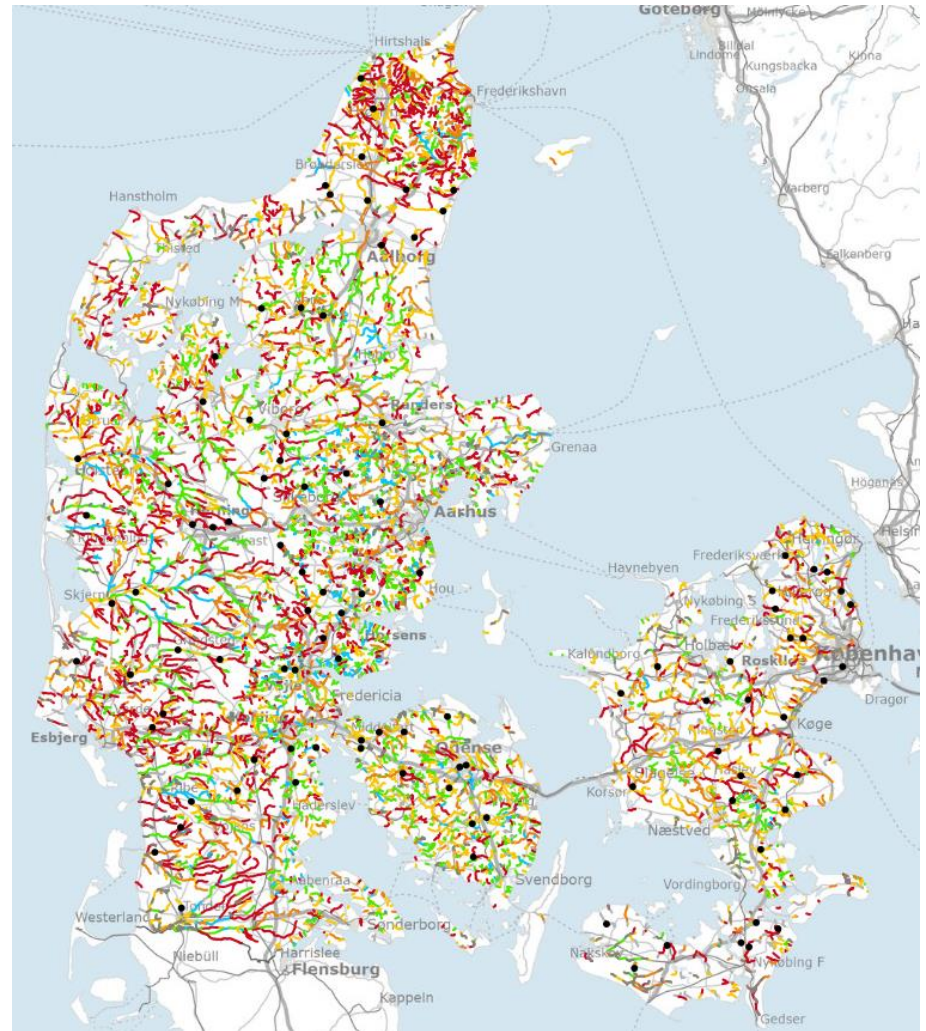
## Statistics

### 7400 (18,500km) river bodies in RBMP

- Catchment area >10km<sup>2</sup>
- <10km<sup>2</sup> if GES/GEP or physical potential to achieve GES/GEP
- >500m
- Approximately 10% are heavily modified and artificial water bodies

## Status

- Classified using biological quality elements – invertebrates, fish and plants. Phytobenthos applied in RBMP3
- Monitoring is carried out every 6 years
- 27% have achieved GES/GEP
- 65% have not achieved GES/GEP
- 7% have unknown ES



## **Water council**

Procedures and programme of work described in Danish law (BEK af lov om vandplanlægning and BEK om vandråd)

- Composed of local stakeholders, including local business owners, environmental organisations and recreative organisations
- Equal distribution of interests in water management
- Water council advises municipalities in river basin
- 1 secretariat municipality per river basin, facilitates, coordinates and reports to the Ministry of Environment
- Ministry of Environment in charge of final approval

2014: contribute to programme of mitigation measures for Danish rivers

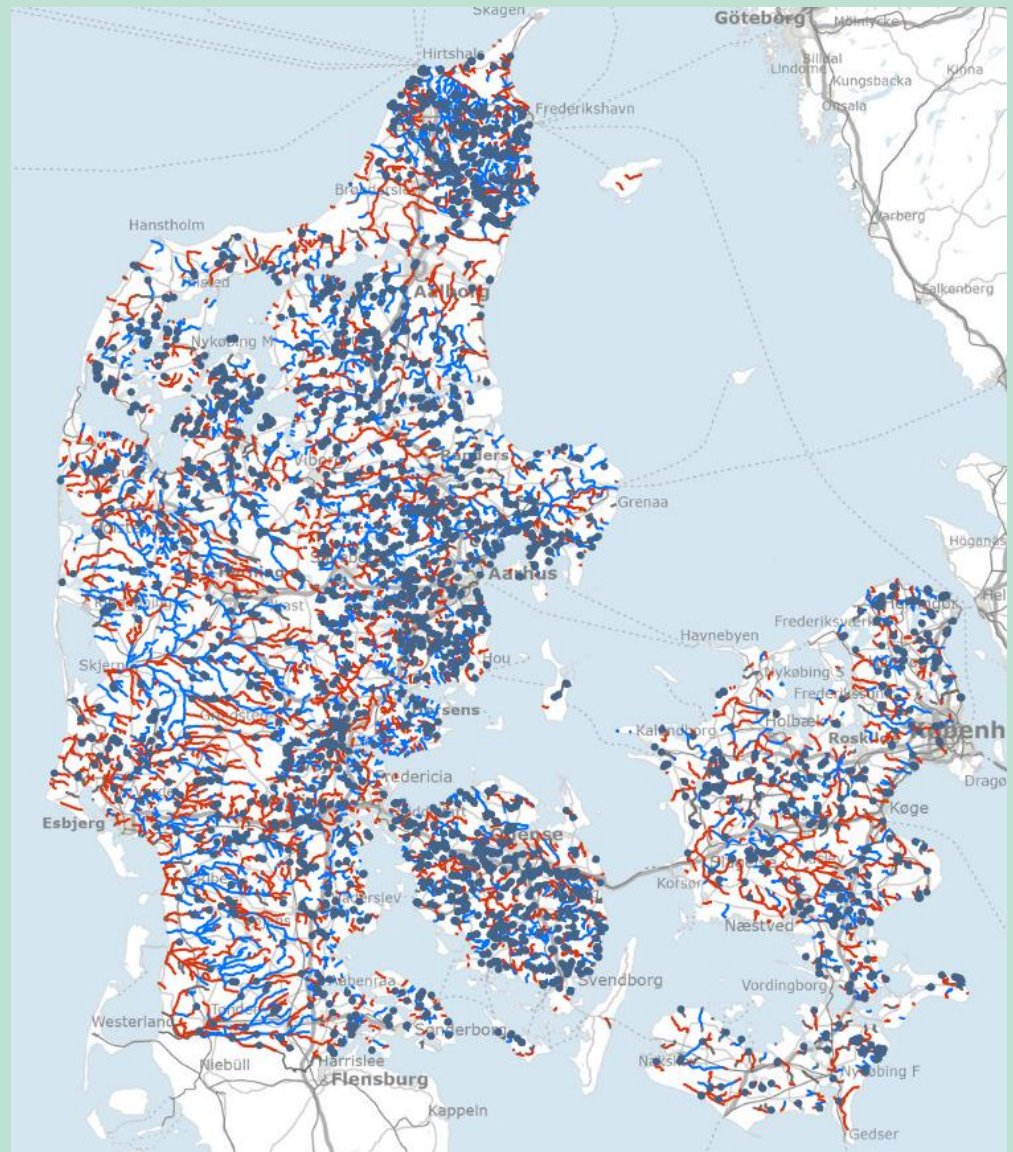
2017: verify water body boundaries and categorise artificial and HMWB for RBMP2

2019-2020: prioritise mitigation measures by applying local knowledge

Evaluation in 2014, indicated success

## Implementation of mitigation measures

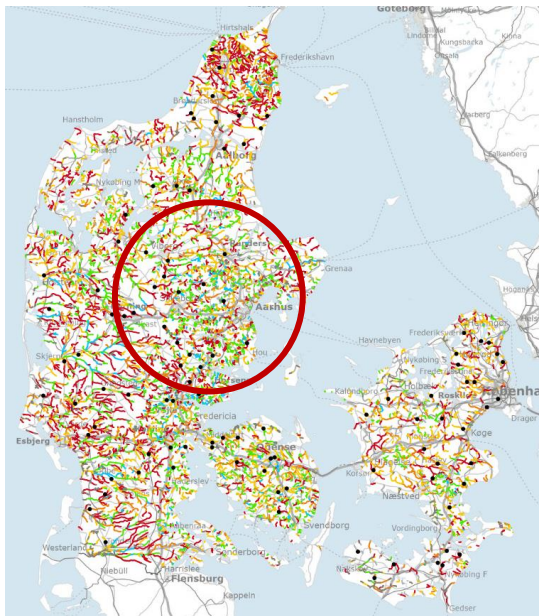
- 41% are at risk of not achieving GES/GEP
- Mitigation measures are applied to rivers at risk
- River continuity is prioritised
- A sum of money is designated to each municipality
- Use catalogue of mitigation measures
- Water councils distribute available mitigation measures focusing on achieving GES/GEP and cost-efficiency
- Mitigation plans are approved by Ministry of Environment for RBMP3
- Municipalities implement measures: projects are approved by the Danish EPA and once completed, municipalities are refunded using national or EU funding



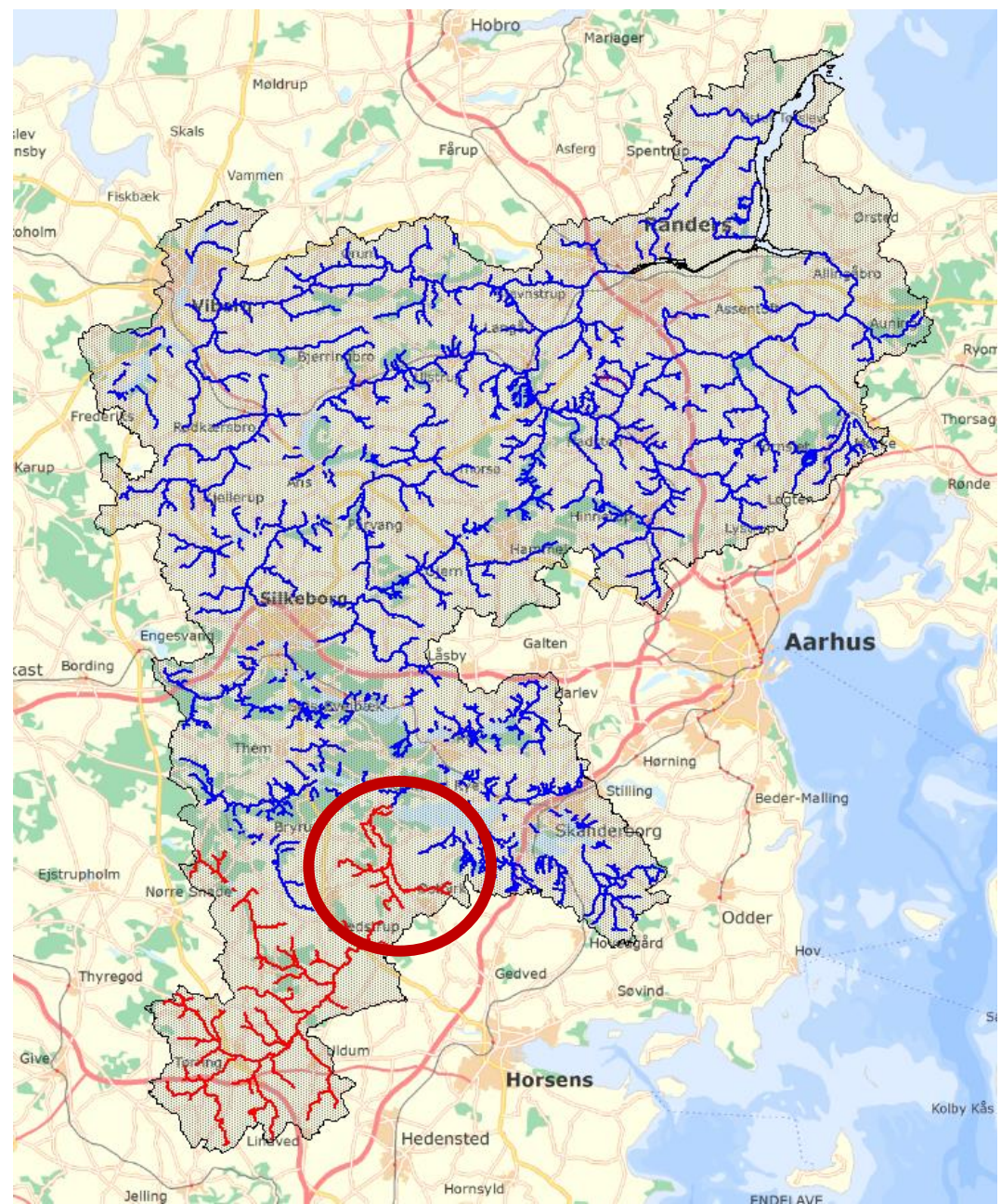
# CASE STUDIES – Restoration of Danish Rivers







- Randers Fjord catchment is a 1,870km river system
- 225km upstream Klostermølle water mill at Mossø (in red)
- 4 projects to establish river continuity (circled in dark red) in Gudenåen







Agency

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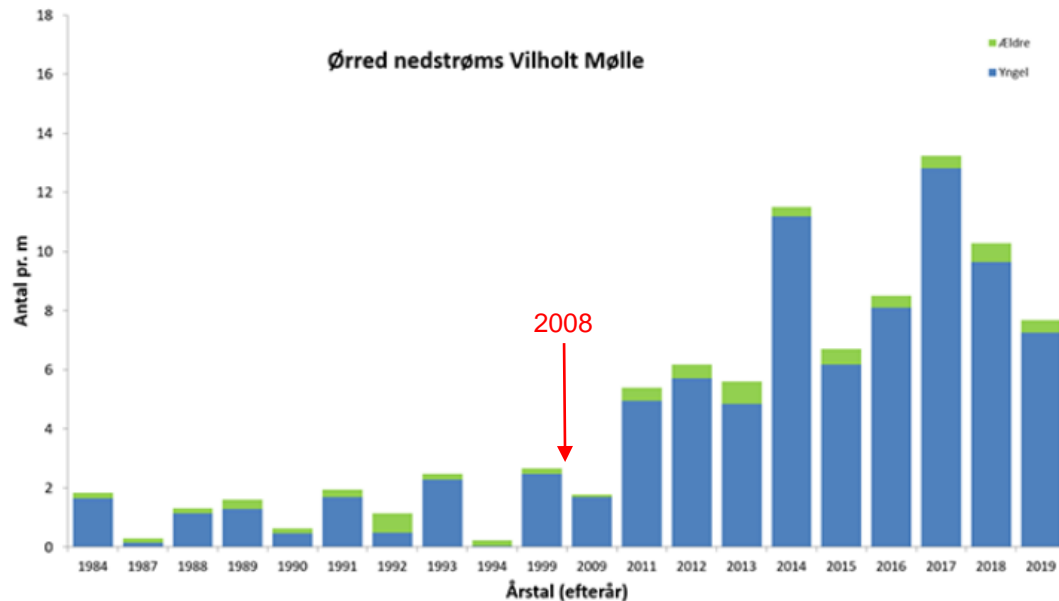




## Vilholt Mill

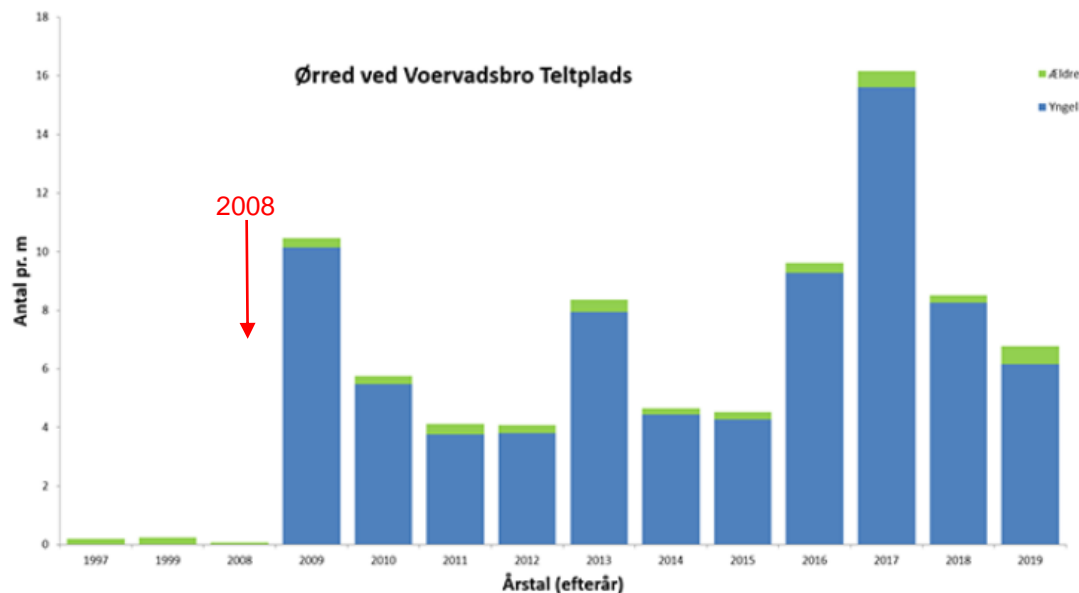
- Weir and mill pond removed in 2008
- New riffle stretch with stone and gravel substrate





Figur 1: Tætheden af ørred på en 600 meter lang strækning ved Vilholt opdelt i yngel og ældre. Den gennemsnitlige tæthed af ørredyngel i perioden fra 2009-2019 er 7,2 pr. meter vandløb.

Removal of barrier in 2008 resulted in immediate increase in trout population downstream (Figure 1) and upstream (Figure 2)



Figur 2: Tætheden af ørred på en 160 meter lang strækning ved Voervadsbro Teltplads opdelt i yngel og ældre.

Den gennemsnitlige tæthed af ørredyngel i perioden fra 2009-2019 er 7,2 pr. meter vandløb.

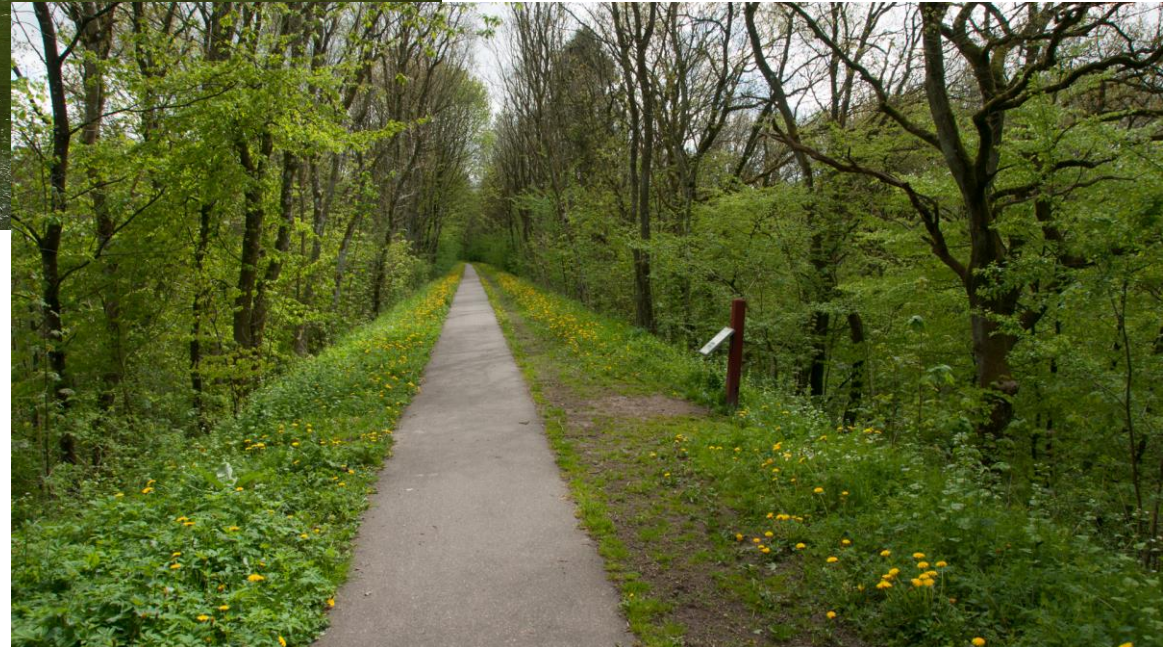
Source: Data from DTU Aqua



Before 2014, the majority of Gudenåen flowed through Vestbirk Hydropowerplant







The remainder flowed through a historic railway dam, on top of which a bicycle path was built.

Approximately 80 years earlier, a steel bridge transversed the river...





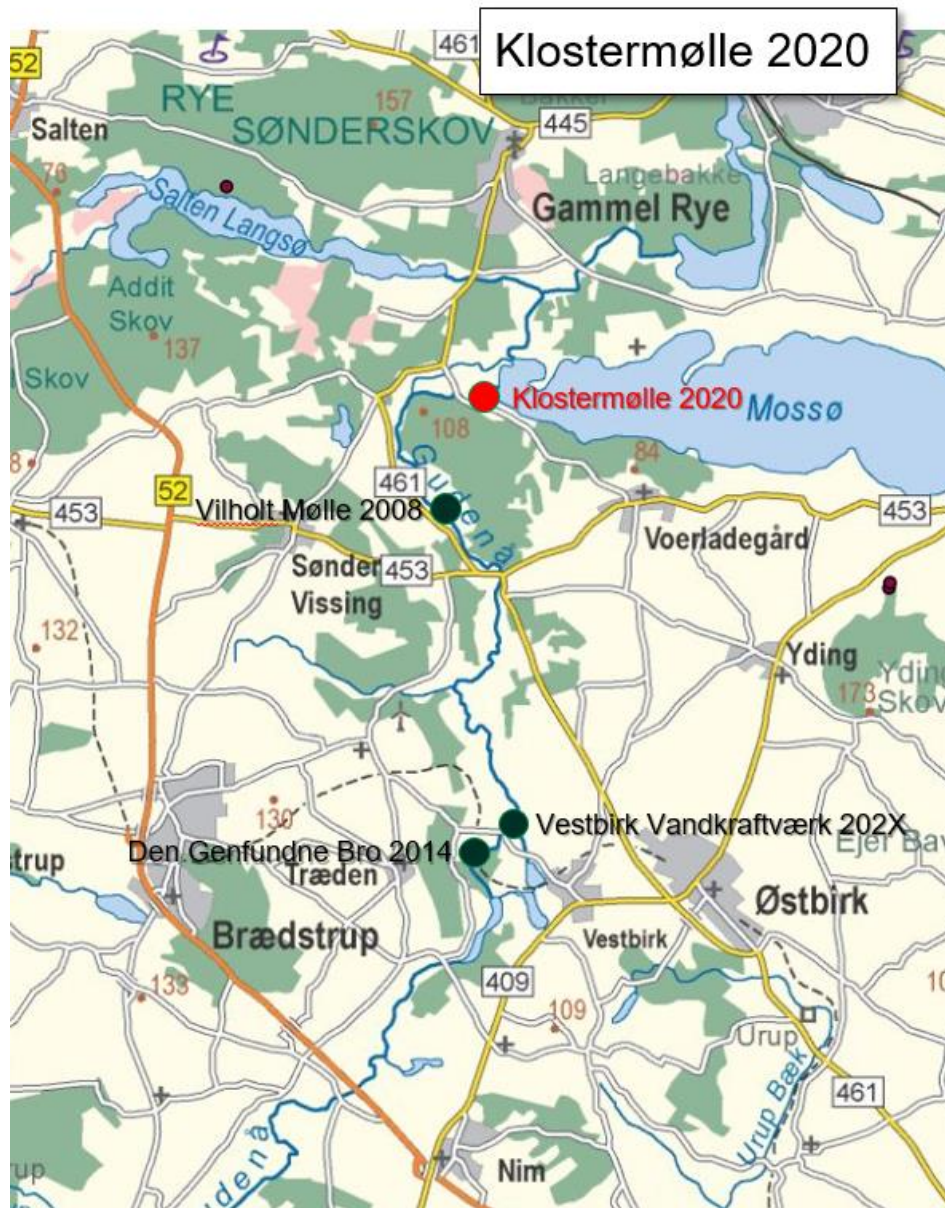


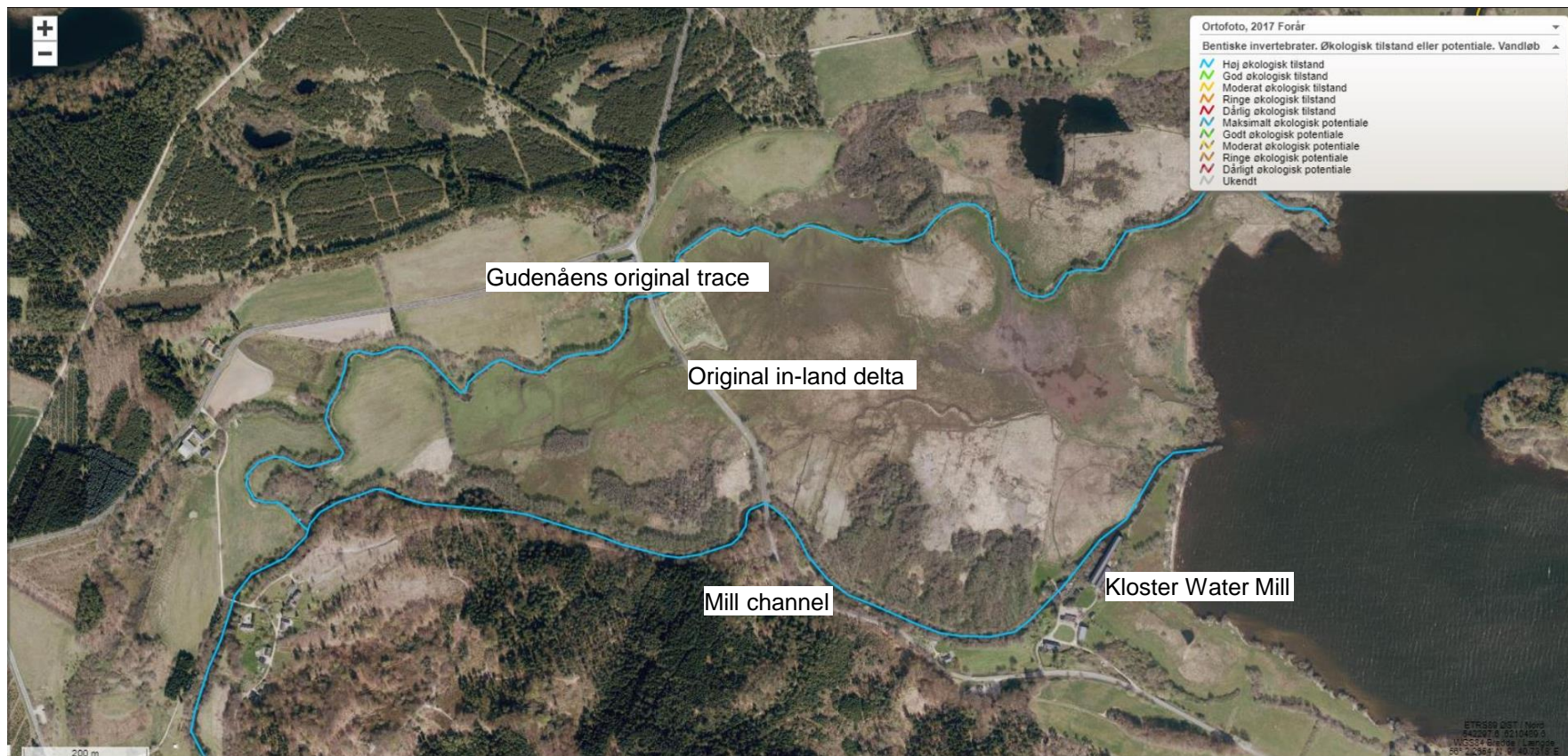
## The Uncovered Bridge

The largest tourist attraction in the area

















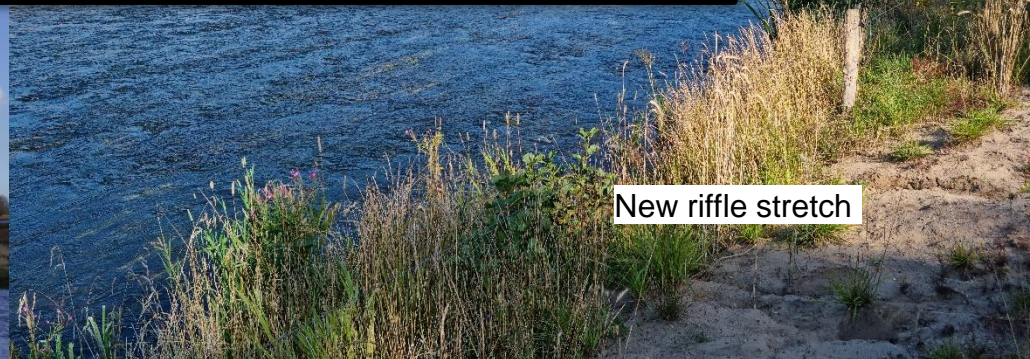
Flow to mill channel reduced



For the first time in 1000 years, Gudenåen flows in its original course



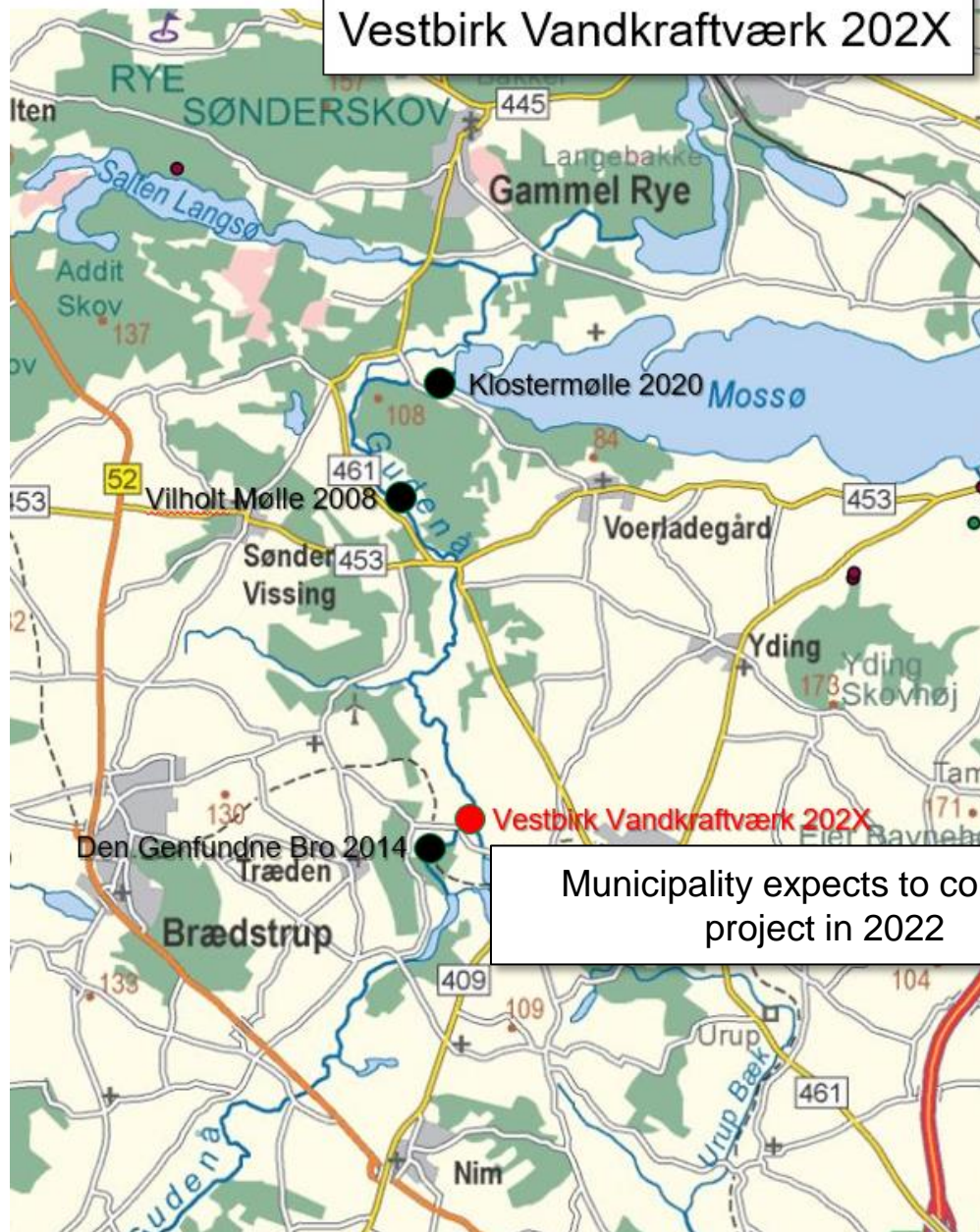
Inlet to inland delta reestablished



New riffle stretch



## Vestbirk Vandkraftværk 202X



Municipality expects to complete project in 2022





# Elleskov Mølle

## Succesful stakeholder engagement



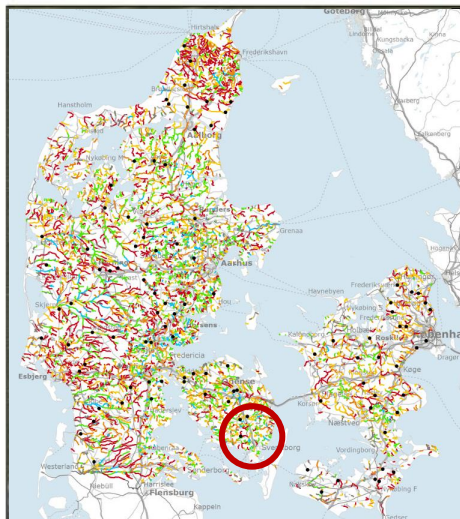
Projekt  
Vandløbsrestaurering  
Elleskov Mølle

Bilag 1  
Projektforslag

### Signaturforklaring

- Vandløb
- Station Hundstrup A
- Særring Elleskov Mølle
- Matrikel
- Projekttiltag**
- Regulering og forlængning af Hundstrup A med bundbredde 4,5 m
- Erosionssikring af svingprofil
- Ny bro
- Midlertidig omlægning af Hundstrup A
- Midlertidig blokering
- Blokering af forløb
- Jord til opbygning af skræningsanlæg

Mål: 1:1.000 (A3)  
Kotesystem: DVR90  
Dato: 21-11-2019  
Udarbejdet: CV  
Kontrol: LGB  
© SDFE





Barrier: 1m drop and funnelling



Reduce slope upstream







### **Stakeholder engagement:**

- Property owners involved in design of bridge and landscaping
- Property owners encouraged to visit similar projects



# Thank you for your attention!

## Any questions?

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