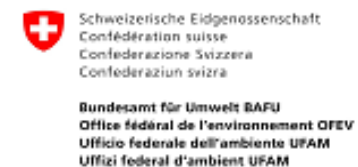




# Tackling climate change effects on aquatic ecosystems in the Rhine river basin

Adrian Schmid-Breton

International Commission for the Protection of the Rhine





# Ecosystem conservation and restoration at the core of our work - Framework of action

- Convention on the Protection of the Rhine (1999) between 9 countries
- EU directives (WFD: 3rd River Basin Water Management Plan of the Rhine basin available) and national legislations
- Rhine Programs: Assessment of Rhine 2020 and now Rhine 2040 (*“The Rhine and its catchment: Sustainably managed and climate-resilient”*)
- Increase knowledge/scientific basis (studies/reports must be update by 2025):
  - Climate change study with projections (2011)
  - CC ecological impact report (2013)
  - Water temperature and low water studies/reports (2014 and 2018), low water monitoring
  - CC adaptation strategy (2015)

# Negative effects of CC on aquatic ecosystems and adaptation measures



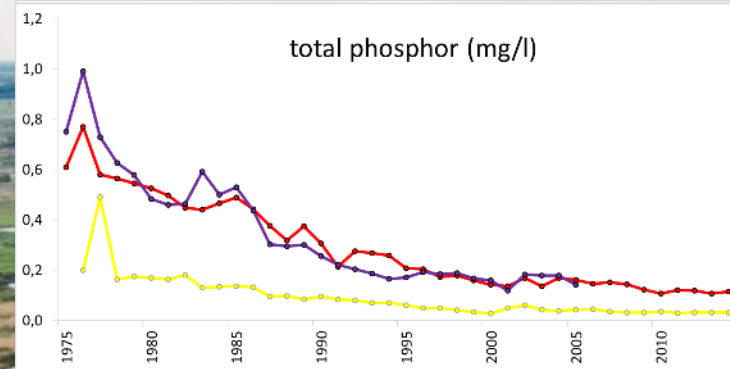
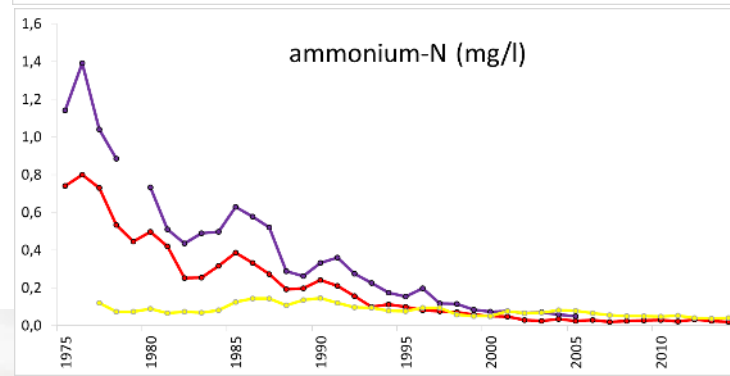
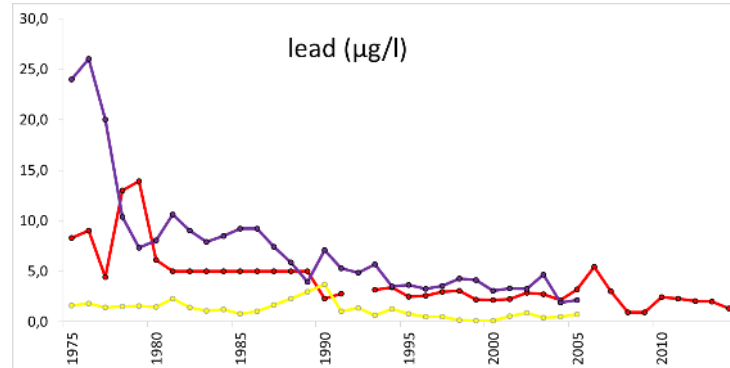
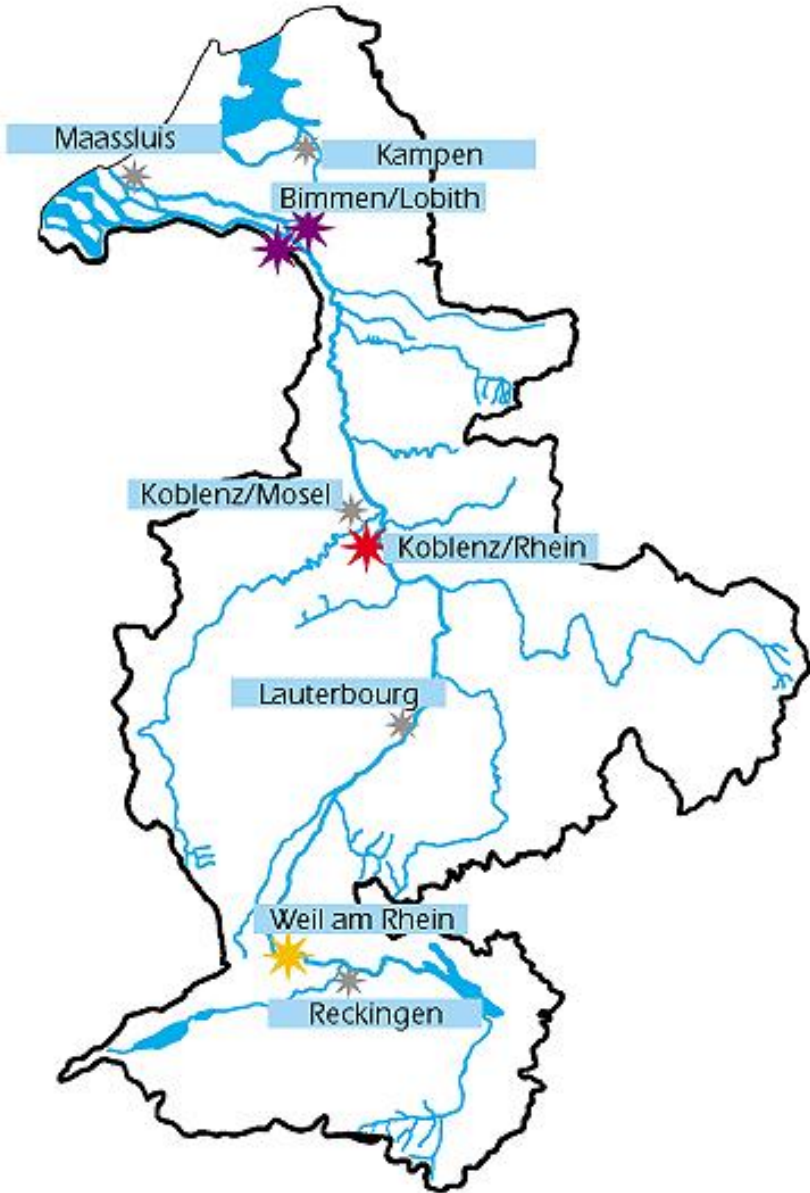
- **Additional stress factor** to various anthropogenic impacts (Rhine catchment is densely settled and heavily industrialized, with also intensive agriculture)
- **Low flow** with the **increase of water temperature** and **oxygen depletion & concentration** rise of **pathogens and chemical contaminants**
- Development of **invasive species** which tolerate higher temperatures

*Therefore, ICPR mitigation actions and measures aim to:*

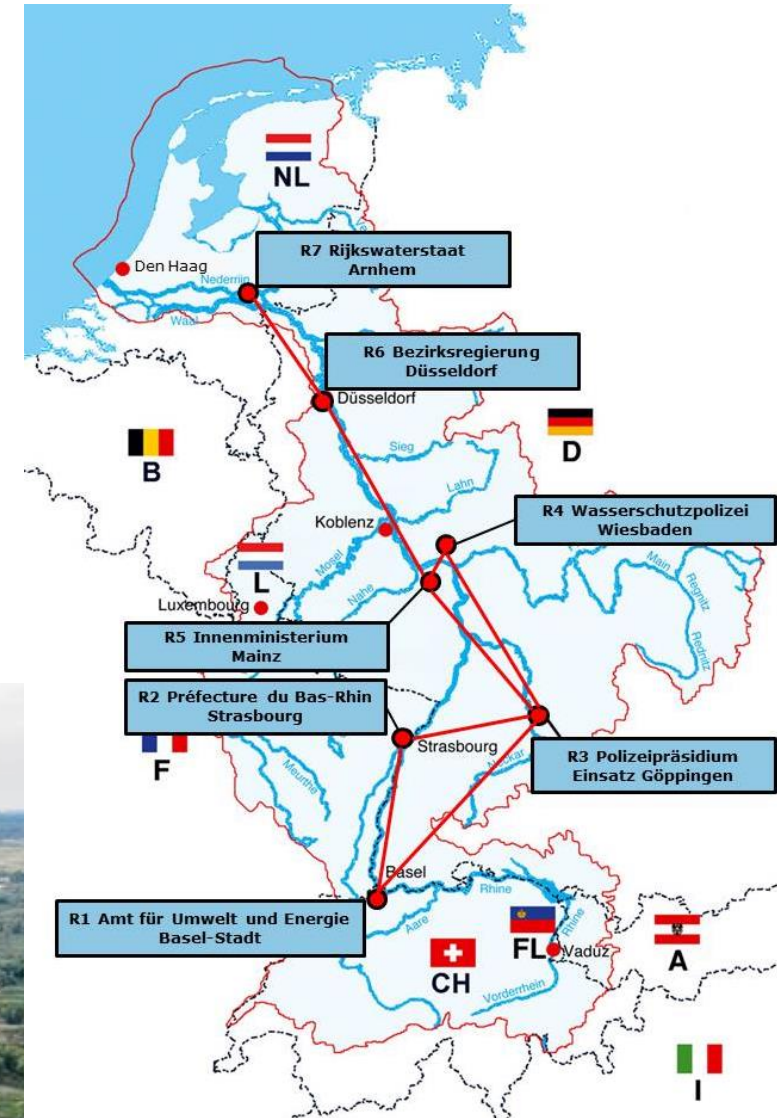
- **Improve water quality**, limit thermal discharges to a minimum
- Protect, restore, connect and **diversify habitats/biotopes** to enhance biodiversity and enable species to find refuge zones
- **Reconnect alluvial waters and floodplains**, improve hydromorphological conditions
- **Restore river continuity** (fish migration)



# Successfully improving water quality



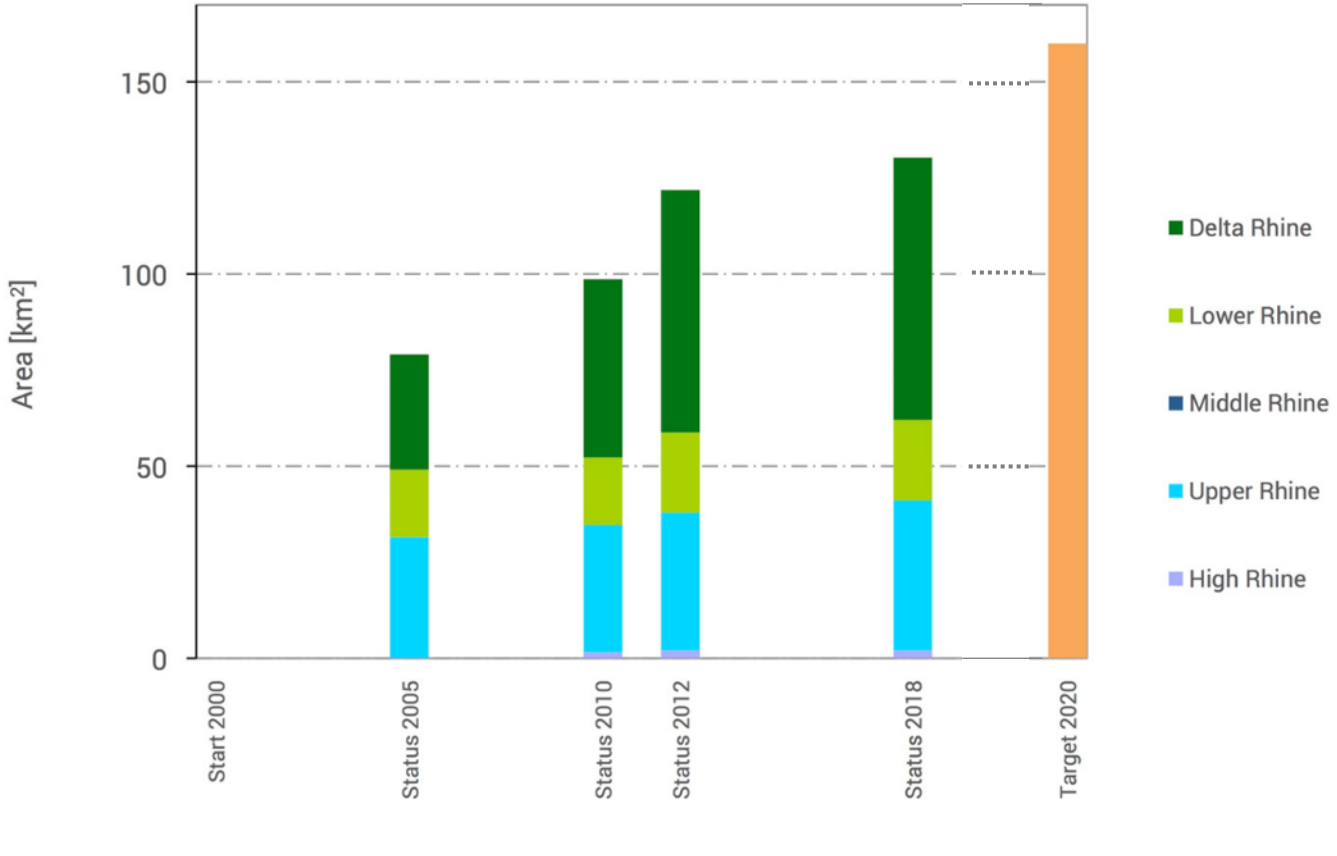
# Warning and alert plan



# Win-win measures enhancing the aquatic ecosystem while mitigating the impacts of negative effects of CC on flora and fauna

## Reactivation of floodplains

**140** km<sup>2</sup>  
of floodplains have been reactivated



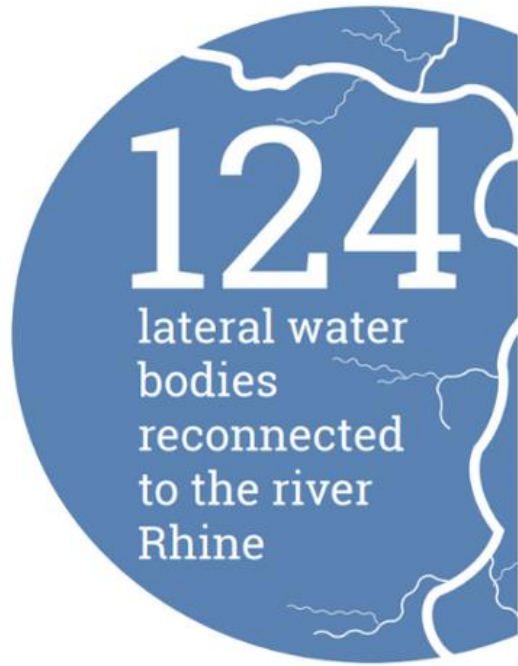
ICPR has identified various regional projects applying synergies between flood prevention/protection and ecological restoration

*Restore another 200 km<sup>2</sup> by 2040*



# Re-connection of lateral water bodies to the Rhine

## Improvement of hydro-morphological conditions



**124**  
lateral water  
bodies  
reconnected  
to the river  
Rhine



Structural  
diversity along  
**166** km  
of riverbanks has  
been increased

Still existing big deficits in riverbank restoration/diversity because of the various use of the Rhine

*Increase structural diversity of 400 km bank by 2040*

*Reconnect another 100 oxbow lakes by 2040*



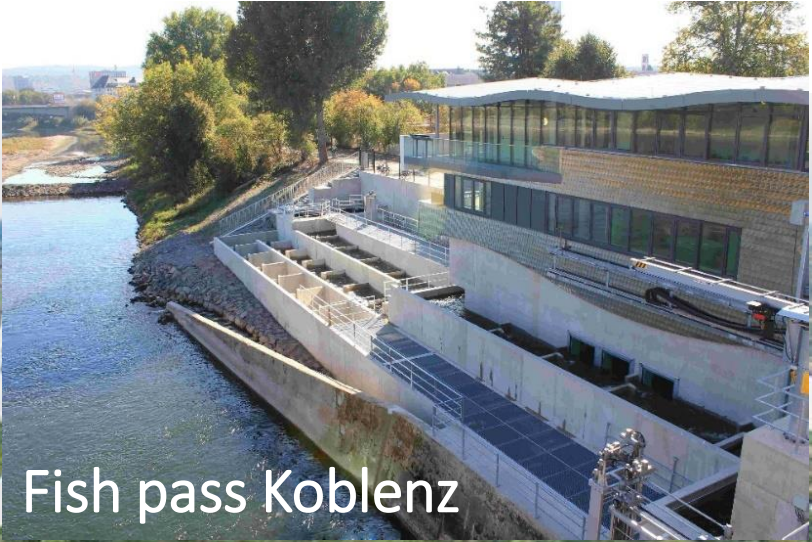
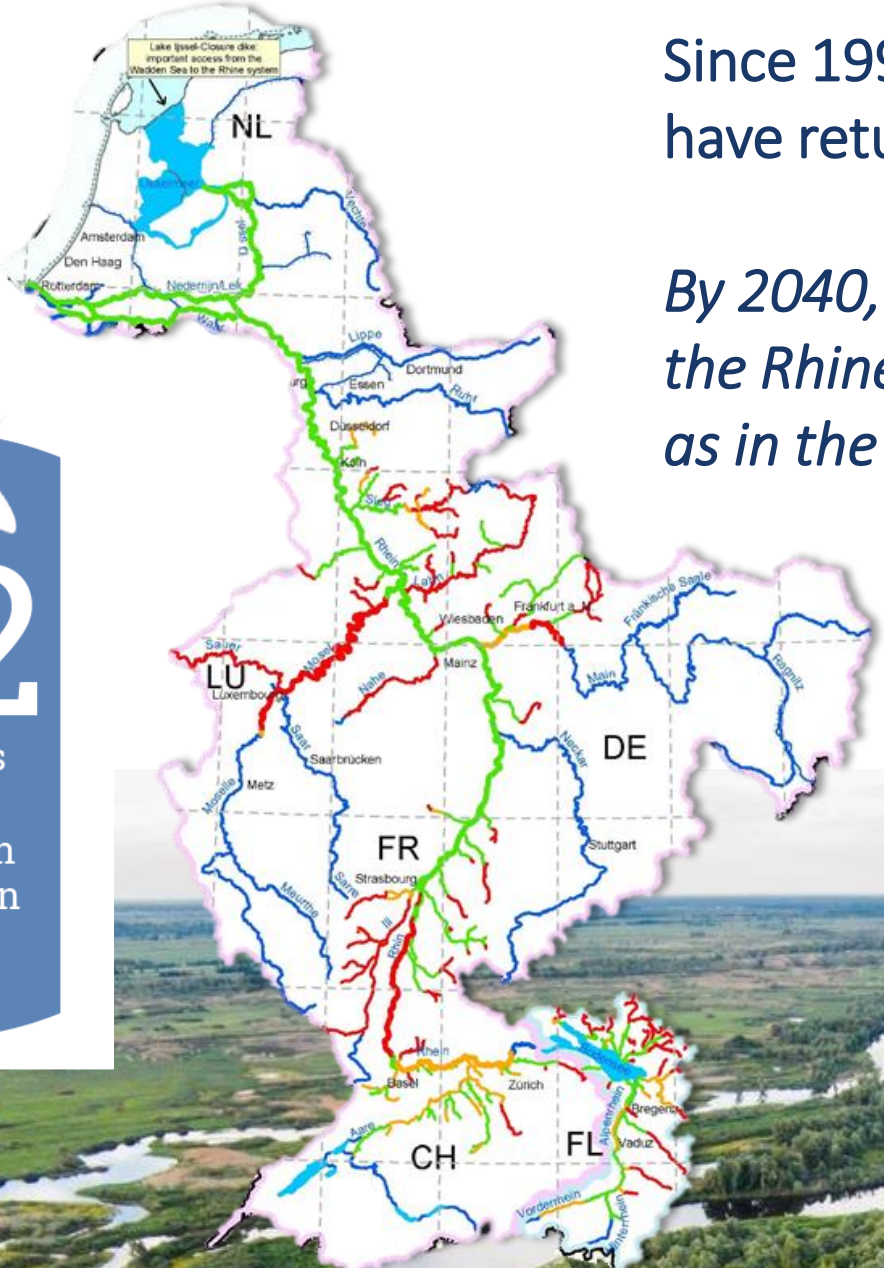
# Restoration of river continuity



Since 1990 : more than 9500 salmon have returned to the Rhine!

*By 2040, restoration of the ecological passability of the Rhine from the mouth to the Rhine Falls as well as in the catchment*

592  
obstacles  
to  
migration  
have been  
made  
passable



Fish pass Koblenz

# Thank you



Email address: [Adrian.Schmid-Breton@iksr.de](mailto:Adrian.Schmid-Breton@iksr.de)



Website: [www.iksr.org](http://www.iksr.org)



Twitter: <https://twitter.com/ICPRrhine/>

