



Rivers Self-Maintenance concept

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NATURAL RIVER PROCESSES AS A BASE FOR RIVER-RELATED
PROTECTED AREAS & RIVER RESTORATION
Coalition Clean Baltic, Expert workshop, 20.04.2023

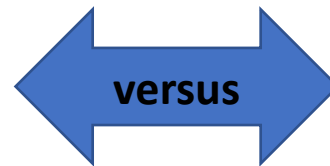


Why do we need Rivers Self-Maintenance concept? Example of Poland

- Because in Poland mainly the principle of “maintaining rivers in good technical condition” is applied
- The concept of “maintaining rivers in good technical condition” does not work in the context of modern drought and flood risk management principles and seriously hampers the achievement of environmental objectives for rivers
- An alternative to "maintaining rivers in good technical condition" is "rivers self-maintenance" based on natural processes



recently dredged river





- River should be kept in good technical condition
- There should be order on the river!

Maintenance of rivers in Polish law

Maintaining waters in the Water Law (Article 227) - almost exclusively activities with an adverse impact on nature and at the same time aggravating the problem of drought

Water maintenance is carried out by:

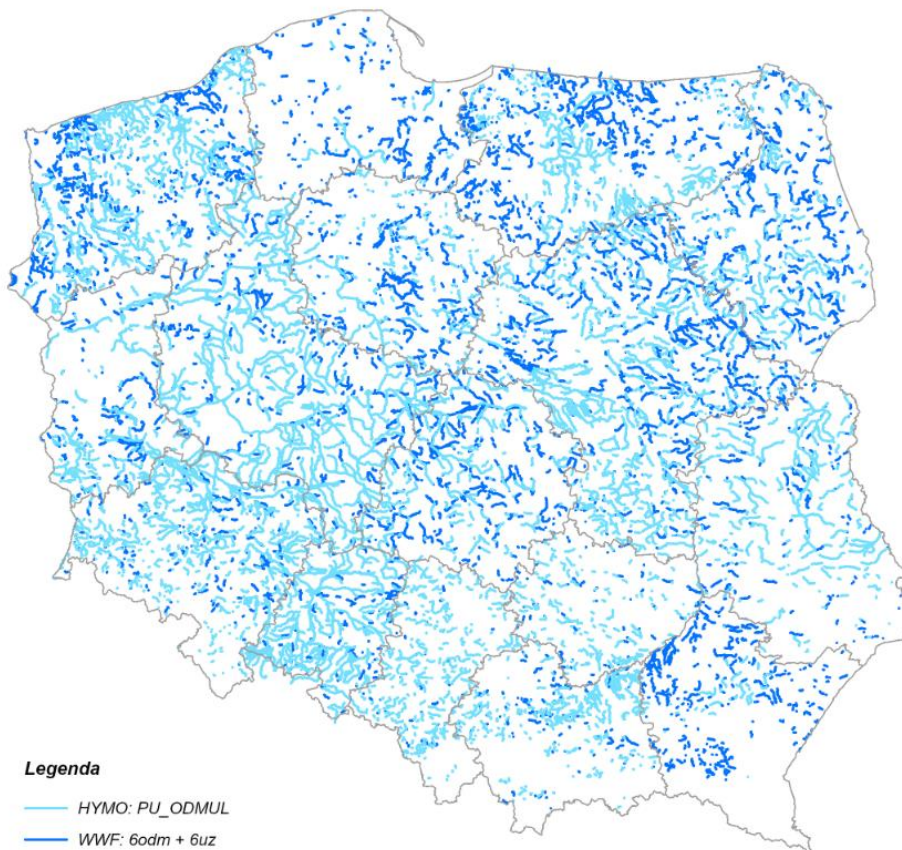
- 1) mowing plants from the bottom and shores of inland surface waters;
- 2) removal of floating plants and plants rooted in the bottom of inland surface waters;
- 3) removal of trees and shrubs growing on the bottom and shores of inland surface waters;
- 4) removing natural and **human-induced obstacles** from inland surface waters;
- 5) filling in gaps in the banks and bottom of inland surface waters;
- 6) **clearing inland surface waters by removing blockages that hinder the free flow of waters and removing silts and debris (dredging the river)**
- 7) renovation or maintenance hydraulic structures by the water owner:
- 8) **demolition or modification of beaver dams** and backfilling of beaver burrows in the shores of inland surface waters.



The scale of maintaining rivers in good technical condition

River dredging (to speed up drainage of the valley)

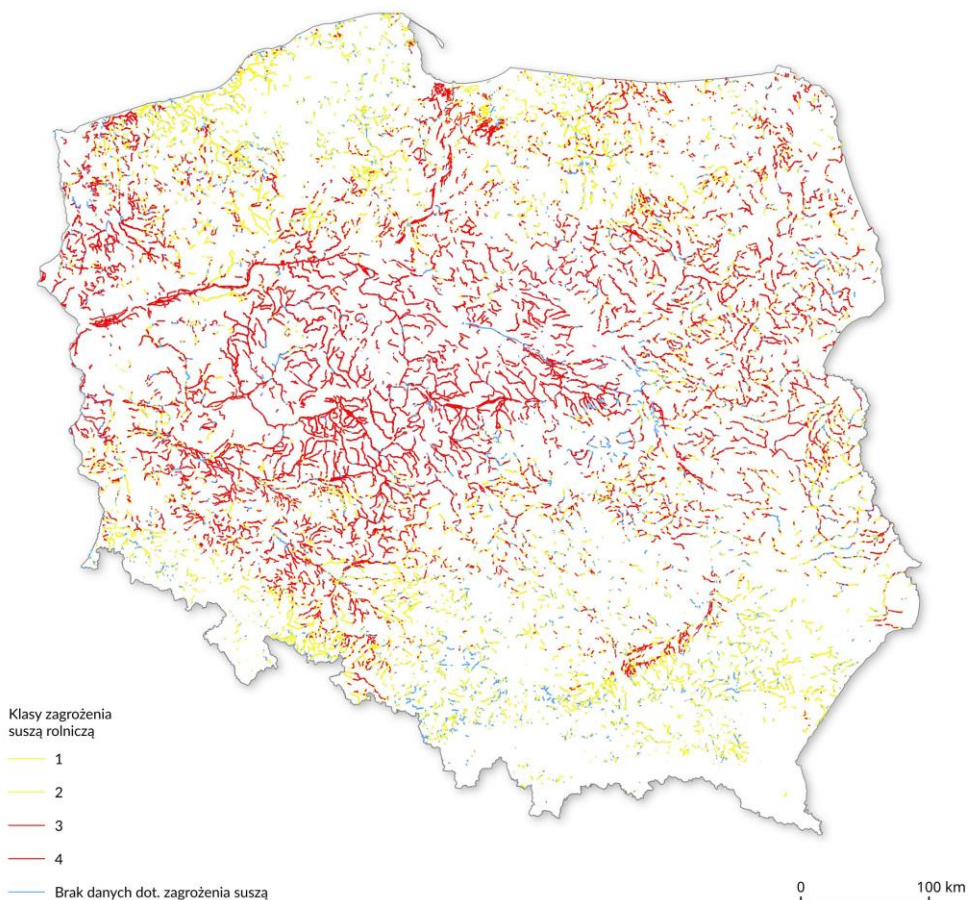
Prace utrzymaniowe: baza HYMO i dane WWF
Udrażnianie przez usuwanie namulów i rumoszu oraz usuwanie zatorów



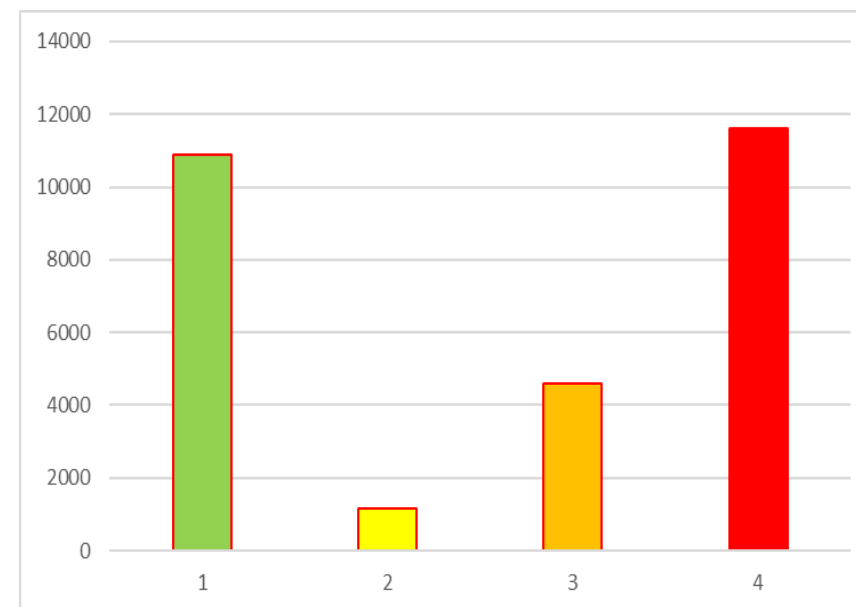
- 2010 – 2017 at least 37,450 km
- More than 50% of the length of the so-called rivers important for regulating the water regime for agriculture



Impact of the obligation to maintain rivers in good technical condition on drought risk management



57% of the of dredged watercourses in areas extremely and highly exposed to risk of the agricultural drought





Environmental effects of maintaining rivers in good technical condition



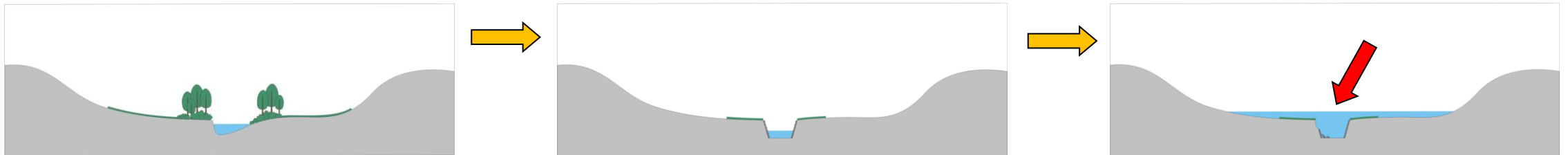
Significant and long-term deterioration of the environment:

- destruction of fish habitats, direct destruction of valuable habitats and individuals of plants and animals protected by Polish and EU law, e.g.:
 - Thick-shelled Mussel (*Unio crassus*)
 - Weatherfish (*Misgurnus fossilis*)
 - lamprey larvae
- permanent lowering of the hydromorphology status of the river by 3-4 classes

Maintaining rivers in good technical condition and public finances

The vicious circle of river maintenance costs:

- First, taxpayers' money is spent on:
 - training the river and removing the natural vegetation that strengthens the banks
 - dredging the river
- and then, taxpayers' money is spent on:
 - repairing hydraulic structures, which are regularly destroyed by the river
 - paying compensation for drought or flood





Maintaining rivers in good technical condition and public finances

The vicious circle of river maintenance costs:

- First, taxpayers' money is spent on:
 - cutting down trees that shade the riverbed
- and then, taxpayers' money is spent on:
 - mowing herbaceous vegetation lushly growing on the bank and in the riverbed thanks to access to light





What would Rivers Self-Maintenance consist of?

Leaving the river to natural processes *after determining the economic and social functions currently performed by the river, after assessing how these functions will change in the future* and after answering some questions:

- Can the *economic and social functions* be performed as well or better by a river which bed and riparian vegetation zone are shaped by natural processes?
- Is the river currently in a sufficiently good condition of hydromorphology for maintaining a *dynamic channel balance, acceptable due to the economic and social functions* of the river?
- If the river is transformed, does it have *the potential to reach an acceptable channel balance* shaped by natural processes in a reasonably short time?
- What *interventions in hydromorphology and natural processes will be necessary* due to the economic and social functions of the river?
- Does the self-maintaining river have the ability to effectively perform *other important functions*, e.g.:
 - Shading of the riverbed to prevent the water from heating up
 - Nutrients absorption (buffer zone function)



An important difference between small mountain and lowland rivers

- „The architect of mountain riverbeds is gravity and rocky and gravel ground”
- „The architect of lowland riverbeds is vegetation”
- Even small mountain rivers have *strength*, they don't take much time to recreate their natural channel, but they need a lot of free space, they are capricious



Stradomka River

Before riverbed training



After riverbed training



After flood

Source: guidelines "Good river maintenance practices" published by WWF Poland



An important difference between small mountain and lowland rivers

- Small lowland rivers are *weak*, they need a lot of time for spontaneous restoration or human help to speed up desired changes





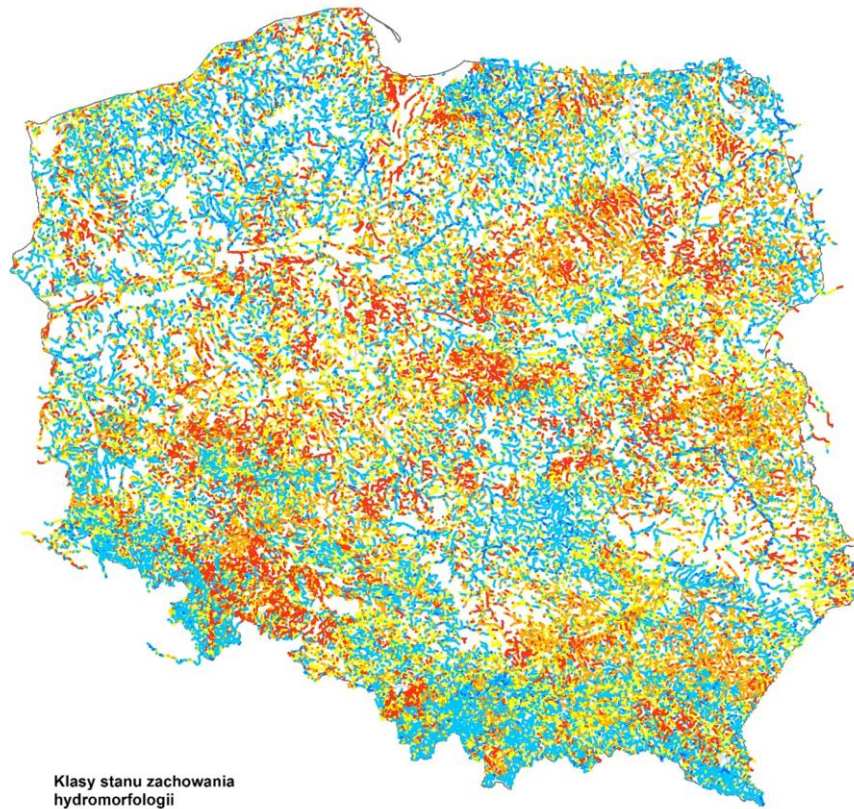
Criteria for selection of river sections best suited for applying the Rivers Self-Maintenance Principle

- High degree of naturalness of the channel,
- A well-developed zone of trees and shrubs along the banks, domination of semi-natural habitats in the river valley
- Slope of the riverbed - information about the potential for spontaneous reconstruction of the natural route of the riverbed





Rivers self-maintenance - the scale of challenges and opportunities



Klasy stanu zachowania hydromorfologii

I klasa	IV klasa
II klasa	V klasa
III klasa	odcinki jeziorne, nie uwzględnione w waloryzacji
granice Polski	

0 37.5 75 150 km

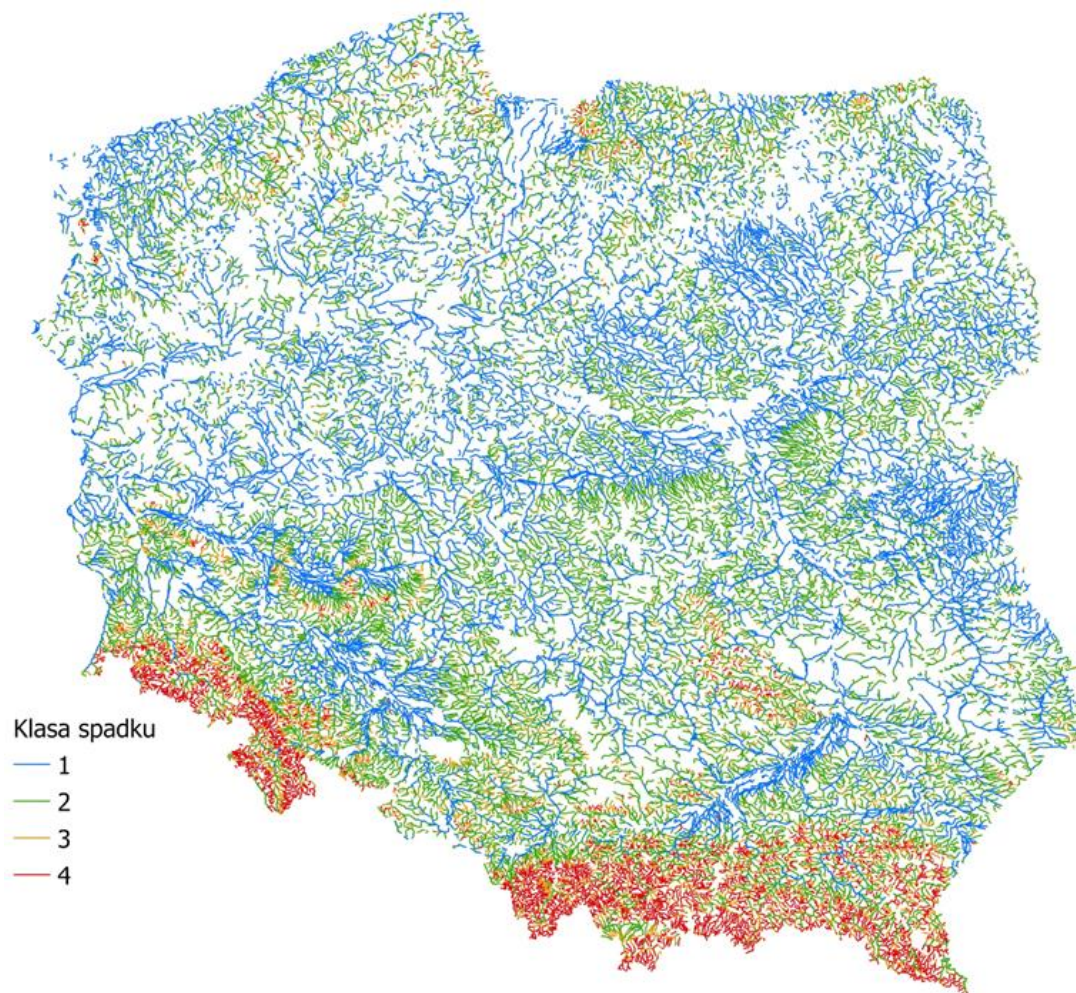
High-resolution hydromorphology assessment is necessary

The Initiative "The most valuable rivers and streams of Poland" by WWF Poland and Poznań Life Science University

- year 2016, the first, preliminary hydromorphology evaluation, to be comparable with Habitat Quality Assessment of RHS method
- 2 km long river sections
- 80,832 river sections assessed



Rivers self-maintenance - the scale of challenges and opportunities

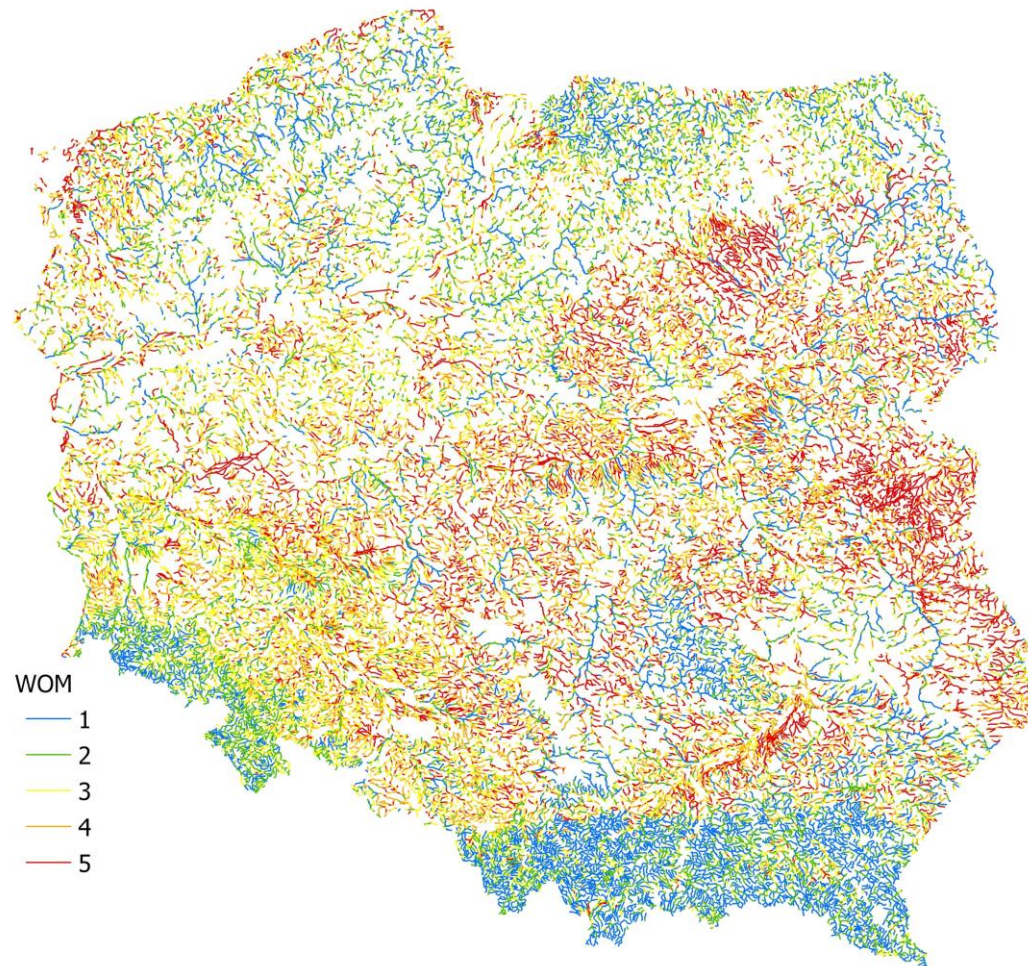


The Initiative "The most valuable rivers and streams of Poland" by WWF Poland and Poznań Life Science University

- The **slope of the riverbed** for sections of rivers with a length of 2 km



Rivers self-maintenance - the scale of challenges and opportunities

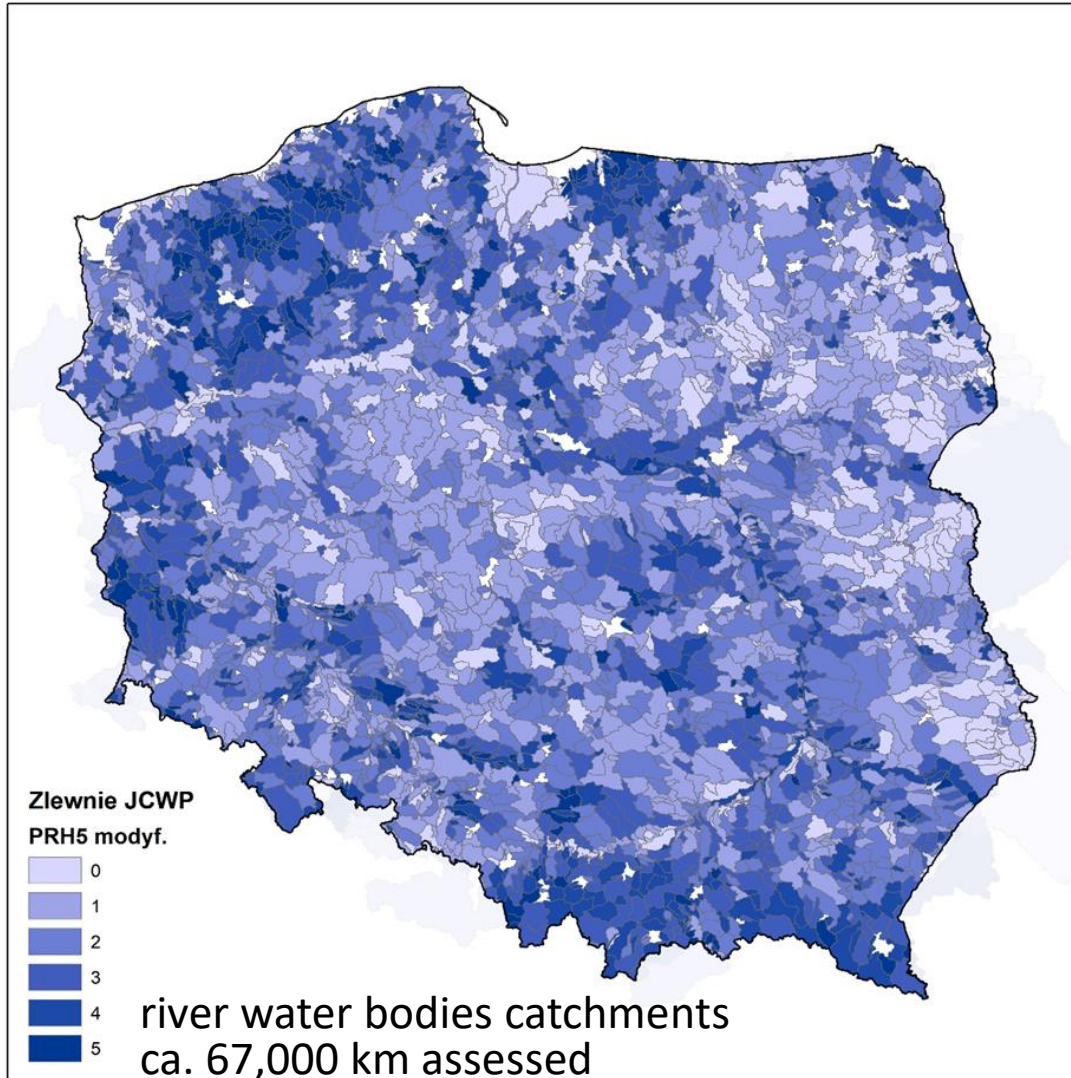


The Initiative "The most valuable rivers and streams of Poland" by WWF Poland and Poznań Life Science University

- Assessment of the degree of **naturalness of the riverbeds - WOM tortuosity index** (distances between meanders)



Rivers self-maintenance - the scale of challenges and opportunities

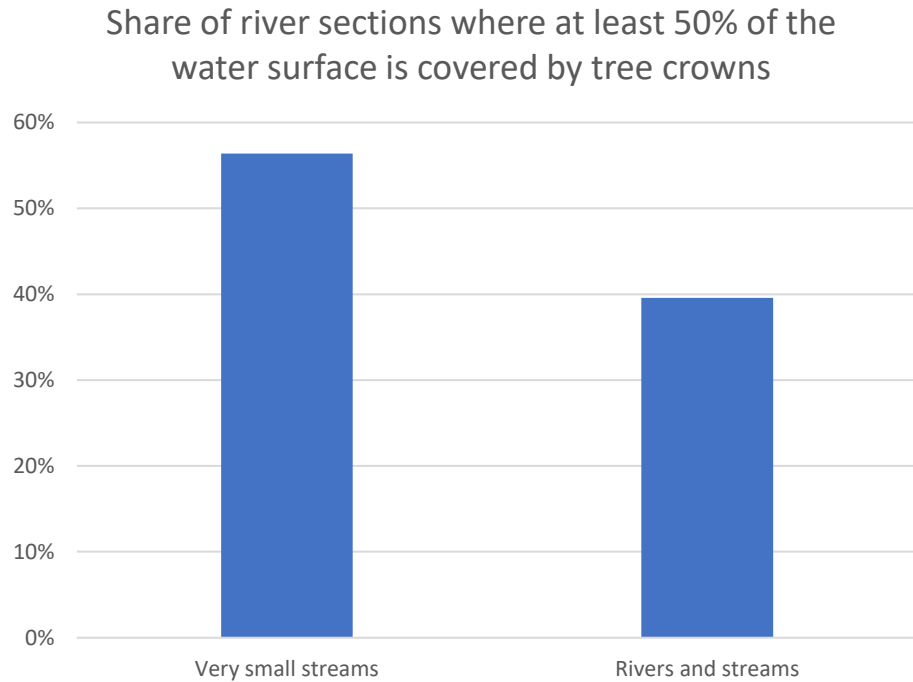


The Initiative "The most valuable rivers and streams of Poland" by WWF Poland, Poznań Life Science University, Warsaw University of Technology and company MGGP Aero

- Evaluation of the **tree stands along main rivers** in water bodies



Rivers self-maintenance - the scale of challenges and opportunities



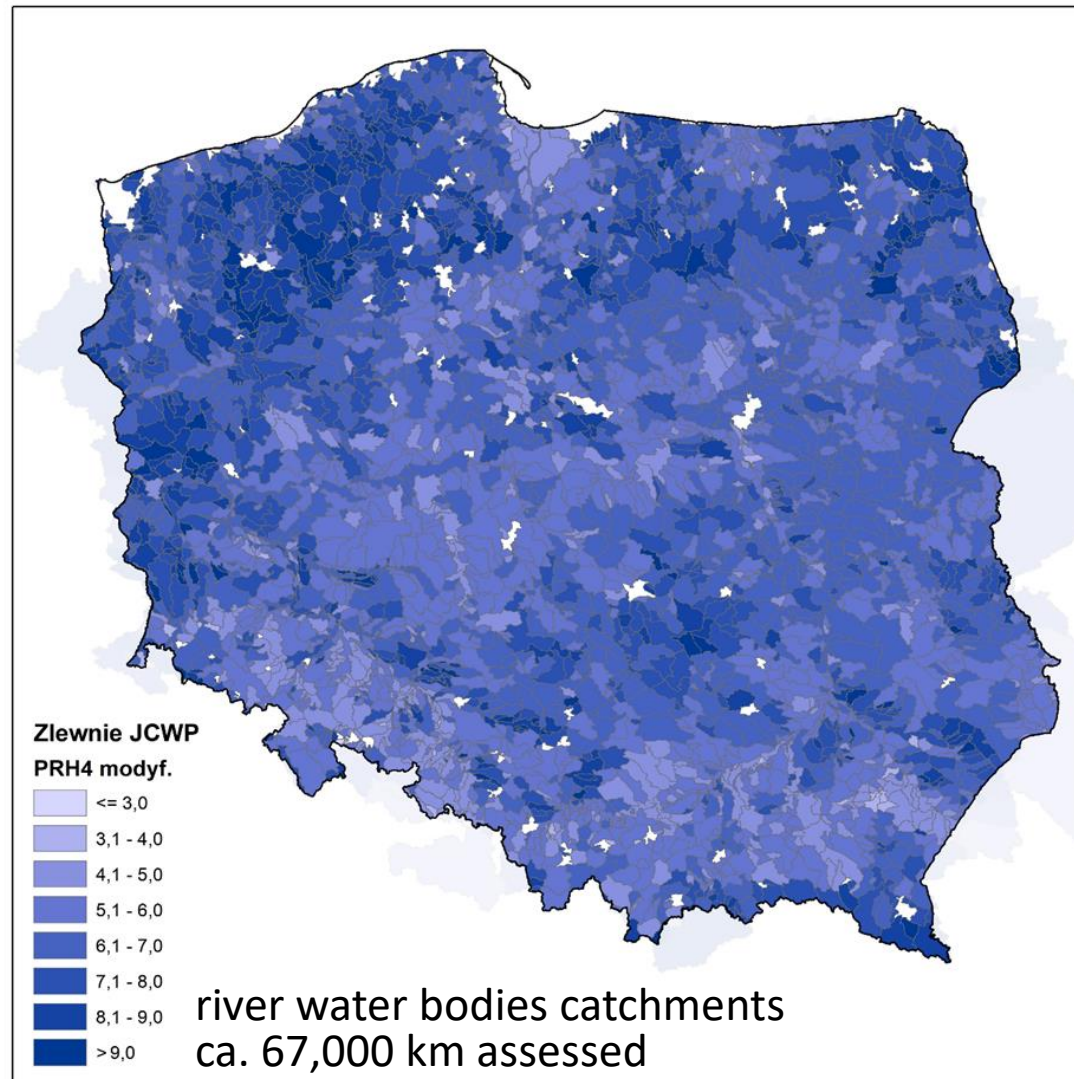
N=2672 of 2 km long sections of the riverbed

The Initiative "The most valuable rivers and streams of Poland" by WWF Poland, Poznań Life Science University, Warsaw University of Technology and company MGGP Aero

- **Assessment of river shading**
Pilot calculations for the Bóbr River catchment by MGGP Aero



Rivers self-maintenance - the scale of challenges and opportunities



The Initiative "The most valuable rivers and streams of Poland" by WWF Poland and Poznań Life Science University

- Assessment of the **naturalness of habitats in the river valley**



The first examples of the practical application of the "Rivers self-maintenance" concept

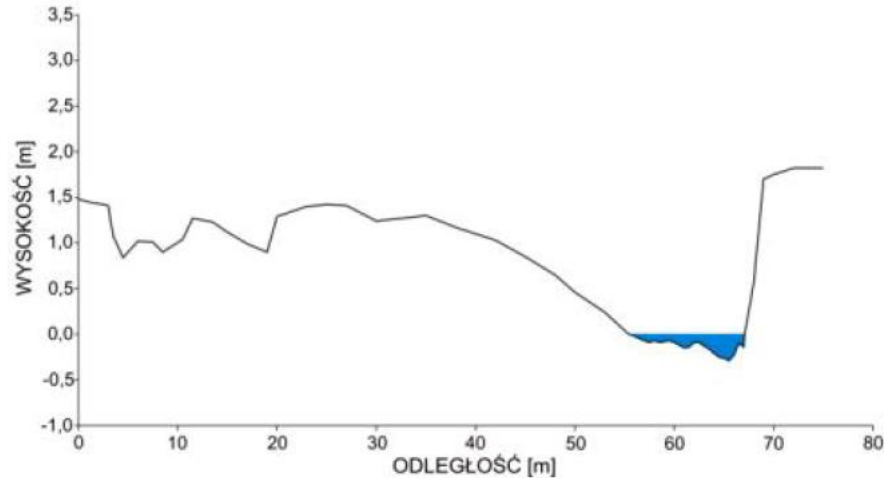


Border meanders of the Oder River Initiative of WWF Poland

- concept of the erodible river corridor: acceptance of the natural dynamics of the river
- instead of reinforcing the riverbed, a free river migration corridor was created
- the need to change the course of the border between Poland and the Czech Republic was accepted
- promoting the border "living meanders" as a tourist attraction



The first examples of the practical application of the "Rivers self-maintenance" concept



The corridor of free migration of the Biała Tarnowska River

Project implemented by Regional River Management Authorities (RZGW) in Krakow, WWF Poland and Institute of Nature Conservation of the Polish Academy of Sciences

- purchase of ca. 20 ha "for a free river"



The first examples of the practical application of the "Rivers self-maintenance" concept



The project "Spawning grounds of the upper Raba"

a project implemented by Foundation Ab Ovo and Regional River Management Authorities (RZGW) in Kraków

- ca. 2 km long corridor for free migration of the riverbed



Proposals for the use of natural processes for the maintenance of rivers in the *National program for restoration of surface waters*

Catalogue of restoration activities for surface waters (rivers included)

- Restoration modifications as part of maintenance works
 - U0 - Leaving to natural processes
 - U1 - Abandonment, limitation or modification of mowing plants from the shores of inland surface waters
 - U4 - Abandonment, limitation or modification of the removal of trees and shrubs growing on the bottom and shores of inland surface waters
- Additional actions as part of normal water management
 - D1- Planting trees and shrubs in the coastal zone
 - D2 - Shaping vegetation in the flood zone and on the banks of waters



SUMMARY

- **The Rivers Self-Maintenance concept is similar to Passive Conservation in terms of expected ecological results (dominance of natural processes, human intervention in hydromorphology and natural processes limited to a minimum)**
- **Gives economic benefits (reduction of river maintenance costs)**
- **Potentially, it can be easily implemented as part of the code of good river maintenance practices used by river management institutions**
- **Maintaining the river in *good technical condition* should aim at achieving the state of *river self-maintenance*, as quickly as possible and wherever possible**
- **In Poland, perhaps at least 20% of small rivers and streams (ca. 40,000 km) could be dedicated to self-maintenance, mainly in the north, west and south-east and included into National River Restoration Plan**



Let's leave the rivers alone, let them take care of themselves!

... especially having in mind ideas for river maintenance works for upper Drawa River included in the Water Maintenance Plan (WMP) for the years 2016 - 2021



Threats to the river according to WMP (requiring maintenance work):

- I - bottom and bank erosion,
- II - accumulation of dragged material;
- III - overgrowing of the riverbed with vegetation rooted in the bottom and banks;
- IV - overgrowing the banks with bushes and trees;
- VII - beaver dams and wild animal burrows.



Thank you for your attention!

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Naszą misją jest powstrzymanie degradacji środowiska naturalnego i budowanie przyszłości, w której ludzie będą żyć w harmonii z naturą.

razem możemy więcej

wwf.pl

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