Hydropower - Position of BUND Naturschutz Bayern

BUND Naturschutz in Bayern e.V.

Hydropower – Good or Bad?

Unused barrage near Hörzhausen,
Foto: Schwäricke (2002)

Enviromental Scientist

Renate Schwäricke
Speaker of the
Work Group „Water“

BUND Naturschutz
in Bayern e.V.

3 of July 2013

Water and Life,
Vhs Schrobenhausen

Ecological Services of Natural Floating Watersystems

BUND Naturschutz in Bayern e.V.

„Rivers and their floodplains are the ecological backbone of our landscape“
Thomas Goppel (CSU), 1996

Paartal near Schrobenhausen, Foto: Schwäricke (2002)

To Nature

- living space with high dynamic potential
- high biodiversity
- creates, suplies and conects wetlands (floodplains, riversides, swamps a.o.)

To People

- natural flood prevention
- recreation
- groundwater developement
- source for drinking-water
- compensation in climate change
- source for food (spec. protein)

WFD-Inventory, State of Rivers

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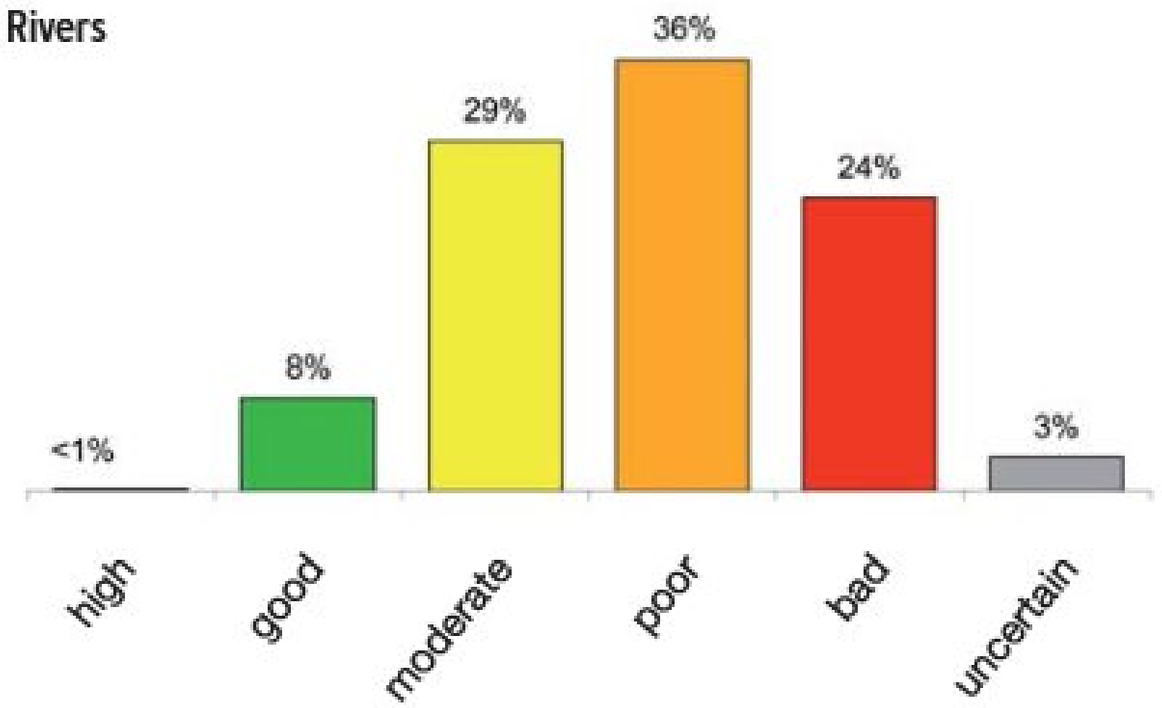
Ecological Status of Rivers in Germany



Source: Portal Wasserblick/ BfG; last updated 22 March of 2010

WFD-Inventory, State of Rivers

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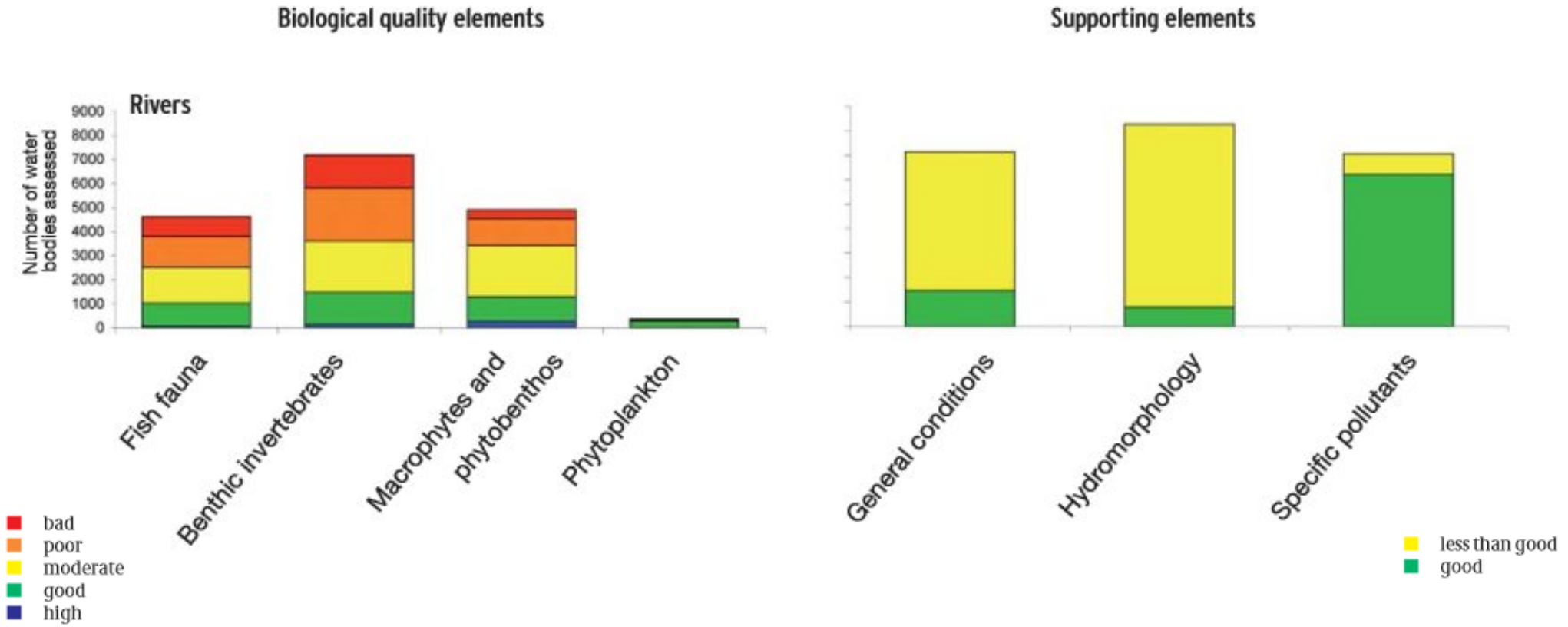
Quality Element Status for Rivers in Germany



Source: Portal Wasserblick/ BfG; last updated 22 March of 2010

WFD-Inventory, State of Rivers

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Canal of power unit Fa. Leipa Schrobenhausen Foto: Schwäricke (2002)

Major Problems

- hydromorphological degradation
  - disrupted river contiunity
  - river bank construction
  - inadaquatly structured river beds
- eutrophication and sedimentation
- decline in fish stocks

Disarranged River Contiunity

- in around 60.000 barrages, 4250 hydroelectric plants, most of them impassable for fish and bedload
- measures are expensive and because of the private water rights difficult to enforce

Flowing Waters Good Structure
WFD – Indicator - Fishes

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How Hydropower Affects Fish

- migration barriers
- death and damage by passaging the turbine (killing rate up to 90%)
- sedimentation destroy spawning ground
- aggregation of the riversoil (loss of fisch feed, benthic invertebrates)
- loss of bedload
- monotone riverbed
- change in range of species

Brown trouts after the passage of a hydropower turbine
Source: Rückbau einer Kleinwasserkraftanlage, Landesfischereiverband Bayern e.V. (2006)

94% of fish species in Bavaria are endangered or lost!

Hydropower Facts Germany

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- 20 TWh electricity generation from hydropower annually
- 4% of Germany‘s total energy demand
- in around 7600 hydropower-plants (HPP):
  - 354 middle and big HPP (>1MW installed output) generates 91% of the hydropower
  - 7300 small HPP (<1MW) generates only 9%
  - most in the southern states (in Bavaria 4250 HPP)
- share of small hydropowerplants in generation of totaly produced electricity: 0,3%,
- this corresponds to a CO_2-avoidance of 0,09%.

➔ ***There is no need to enforce the number of small HPP***

Hydropower and Climate Change

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Future Changes Caused by Climate Change:

- change in the hight and intensity of precipitation, increase of droughts
  - change of water availibility
  - extended period of low water, also more frequent floods
- melting of the glaciers

What are the Consequences for Hydropower?

- loss of energy generation 1- 4% in near future, - 15% in the more distant future
- especially in periods of low water, there is an ecological demand for more residual water (from „Potentialermittlung für den Ausbau der Wasserkraftnutzung in Deutschland“, BMU 2010)

Hydropower and Greenhouse Gas

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Free of Carbon Dioxid Isn`t Free of Greenhouse Gas!

- 1990: first proof for Methane (CH_4)-developing process from waterplant in Brasil:

  „The methane-emissions produced by the sediment of the Curuá-Una-Reservoir are 3,5x higher than generating the same quantity of energy from oil“

  Philip Fearnside, Brasilianisches Institut for Amazonas-Reseaerch in the „New Scientist“
- 2010: proof for CH_4- developing process in a suisse reservoir
- 2012: initial research contract for a german university (Koblenz-Landau) and the BfG: proof for massive CH_4-formation and outgassing from barrages in the river (Saar)
- 2013: the results are confirmed by further investigations at the river Main

CH_4: greenhouse effect is 25 times stronger than CO_2

Hydropower and Climate: Conclusion of BUND Bayern

BUND Naturschutz in Bayern e.V.

Climate Protection with Hydropower as Renewable Energy:

- **small HPP: contribution is insignificant by causing big ecological damages, responsible for problems in reaching the goals of WFD** (Umweltbundesamt, Hrsg.: „Umweltverträglichkeit kleiner Wasserkraftwerke – Zielkonflikte zwischen Klima- und Gewässerschutz“. UBA Texte 13, 1998)
- **big HPP: methane-formation isn‘t considered in the climate balance, the latest studies have shown that the emissions are very high** (Forschungsauftrag der Bundesanstalt für Gewässerkunde und der Universität Koblenz/ Landau seit 2012)

Measurement of upcoming methane-bubbles in the river Main by Universität Koblenz-Landau

Hydropower isn‘t good for climate protection!

Hydropower and WFD: Conclusion of BUND Bayern

BUND Naturschutz in Bayern e.V.

Restoration of the Continuity of Watercourses as an Integral Element of WFD :

- restoration at the highest level at existing HPP
- with new HPP at weirs we can‘t achieve river-contuinity, but more risk for fish because of the turbine
- fish pass upstream doesn‘t work for all sizes and species
- fish pass downstream still needs a lot of research

„Fish-Stairs“ in Mittelfranken, Foto: Schwäricke (2009)

With Hydropower we wouldn‘t achieve the good ecological status of our rivers!

Hydropower isn‘t a Green Energy

BUND Naturschutz in Bayern e.V.

Living Rivers Need Their Energy for Themselves!

The Ammerschlucht, view from Echelsbacher Brücke
Source: Infobroschüre Ammer-Allianz „Für eine naturnahe Ammer ohne neue Wasserkraftwerke!“ (2008)

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