

# Bottlenecks for fish migration in the Rhine

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**Expert Group FISH**



Internationale  
Kommission zum  
Schutz des Rheins

Commission  
Internationale  
pour la Protection  
du Rhin

Internationale  
Commissie ter  
Bescherming  
van de Rijn

**International  
Commission  
for the  
Protection of  
the Rhine**

# Historical salmon waters in the Rhine river basin

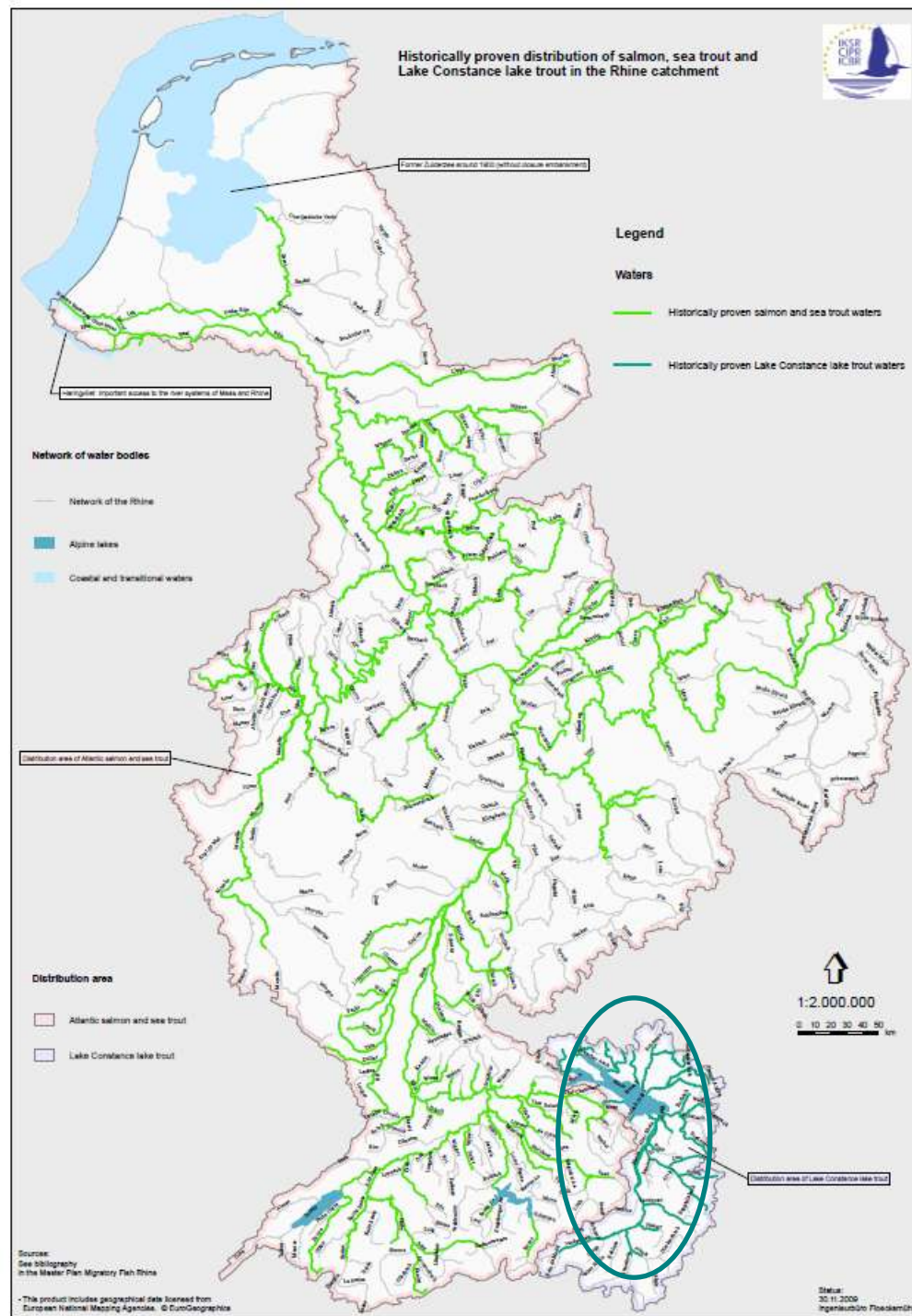


*Salmon* Foto: J. Schneider



*Lake Constance trout*

Photo: P. Rey



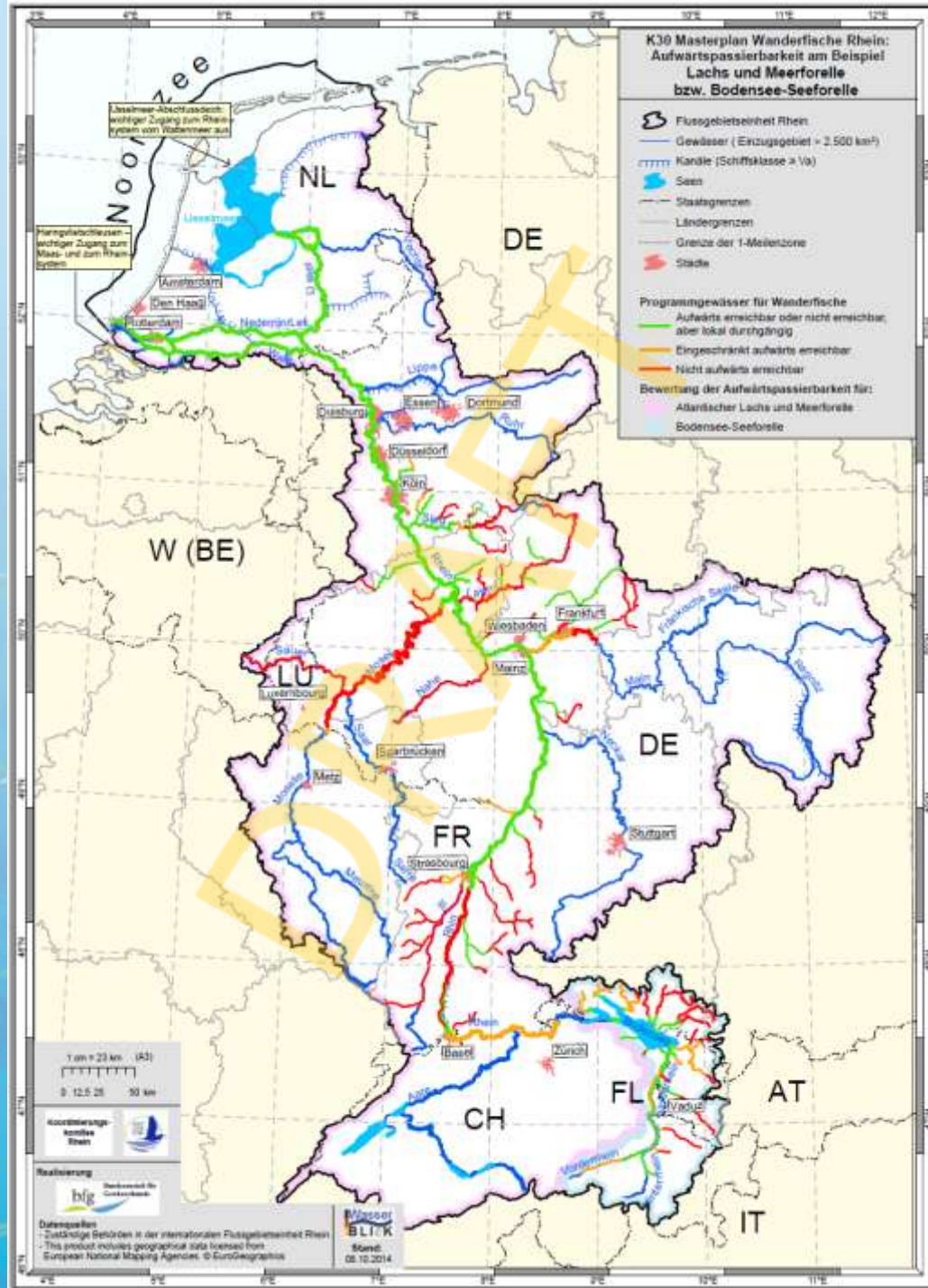
# Master Plan Migratory Fish Rhine

River continuity in the  
program waters

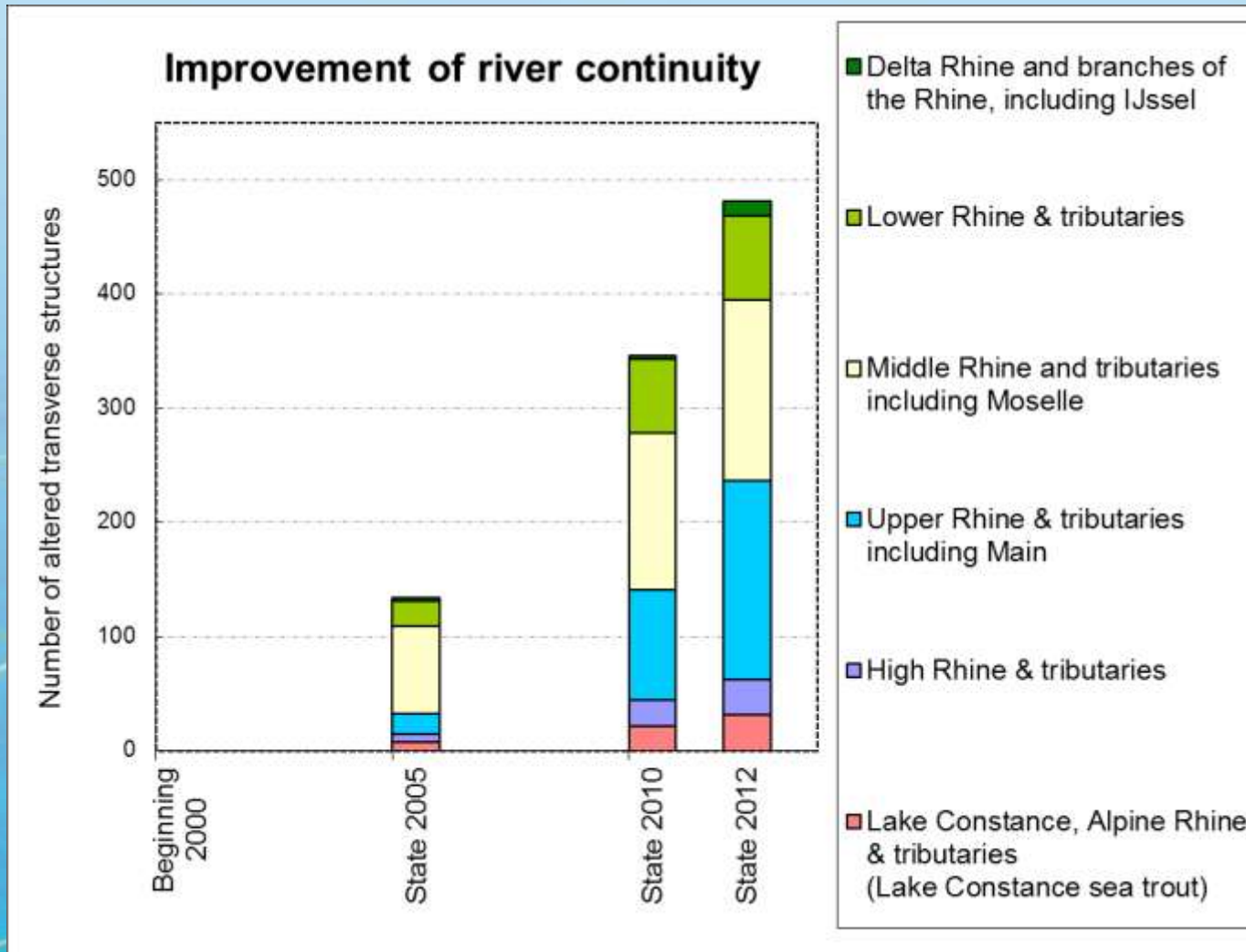
Restoration of  
habitats

Stocking

Total costs: €560Mln  
(data October '14)



# Master Plan Migratory Fish Rhine: - river continuity -



**481 barrage weirs** were altered between 2000 and 2013

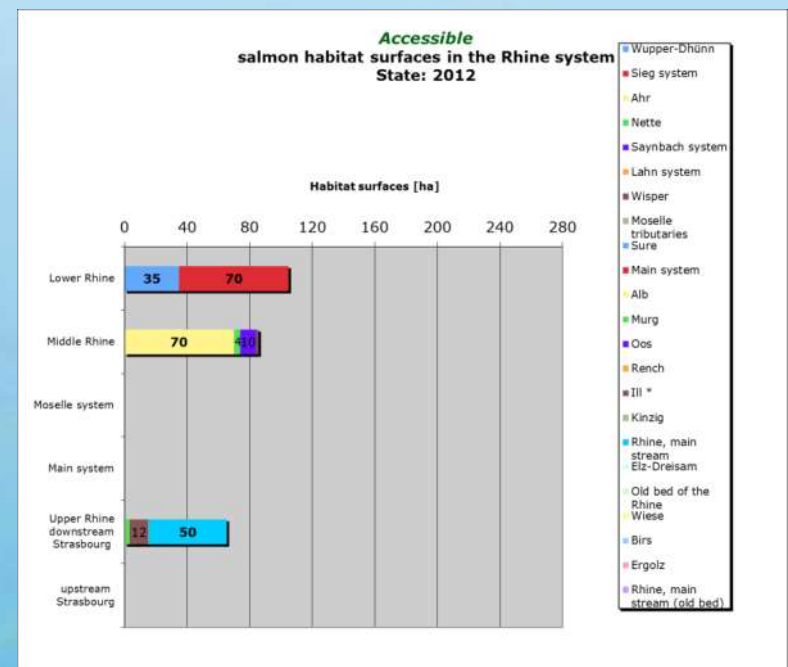
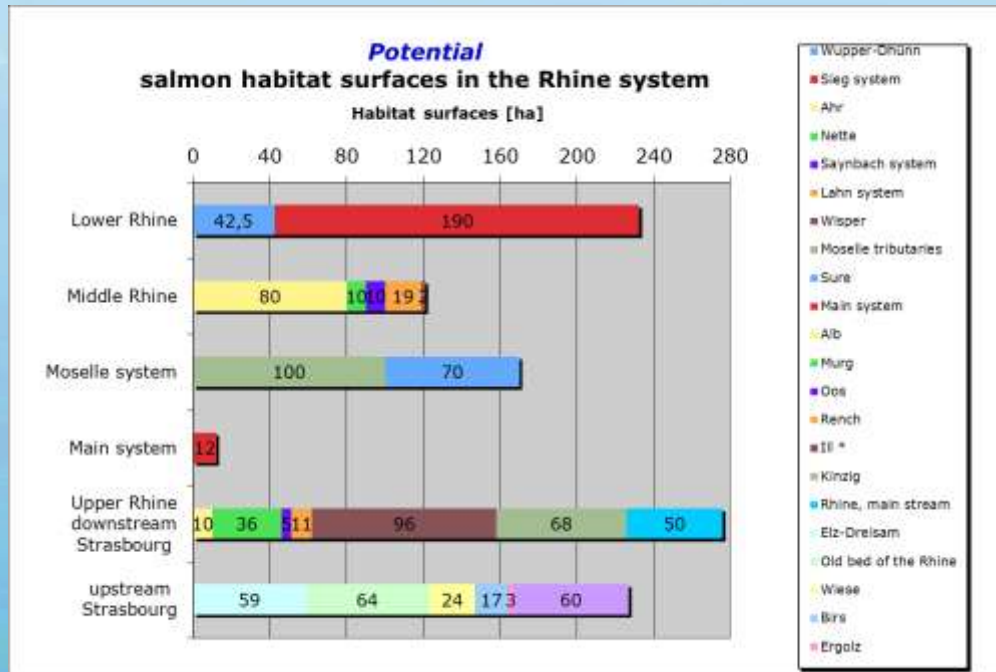
(focus on upstream migration)

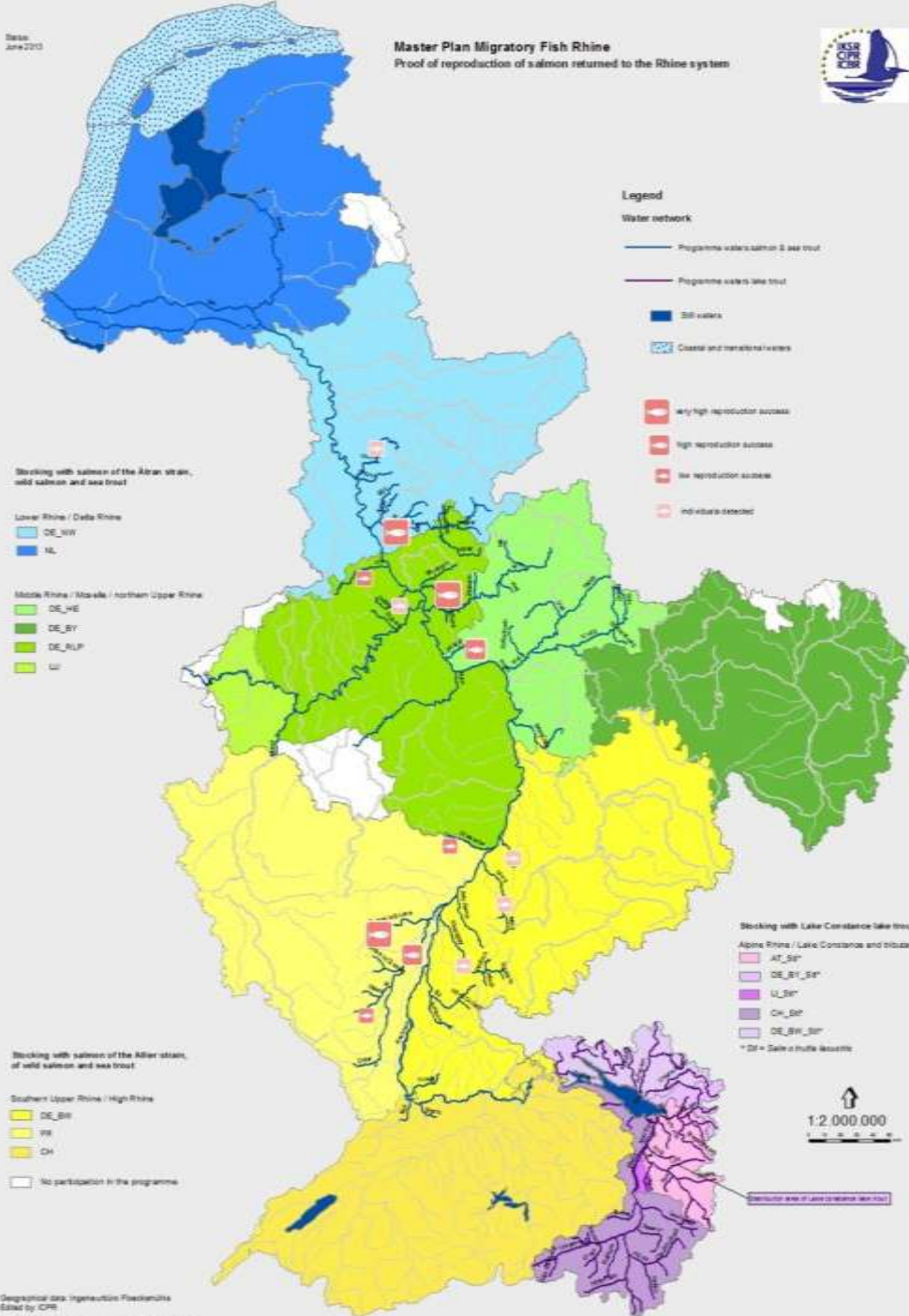
# Master Plan Migratory Fish Rhine: - spawning habitats -



Potential => + 200 ha in Aare (CH)

accessible in 2012



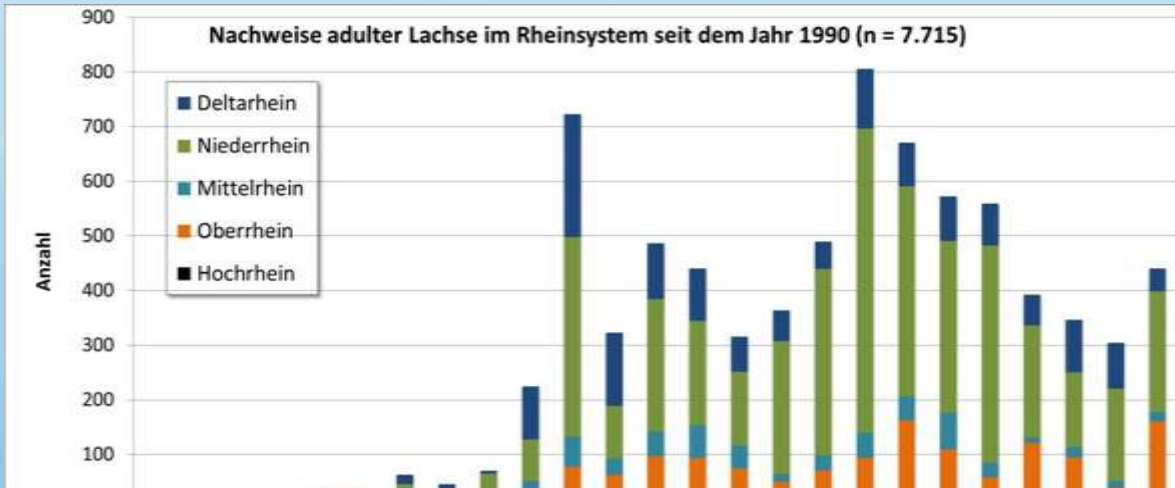


# Master Plan Migratory Fish Rhine:

## Stocking & natural reproduction of Atlantic salmon in regional coordination units

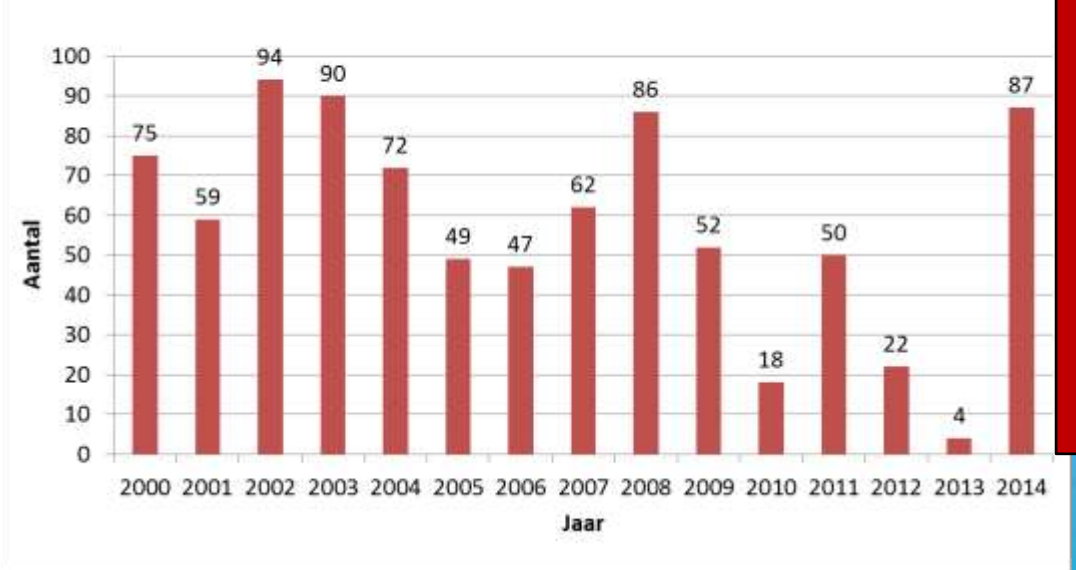


# Salmon returners



Jahr	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Deltarhein	0	0	0	0	23	11	17	15	5	97	225	134	103	97	65
Niederrhein	1	2	10	18	9	7	16	13	52	76	365	96	242	191	135
Mittelrhein	0	0	1	0	0	1	5	12	5	48	56	31	45	59	42
Oberrhein	0	0	0	0	0	9	24	5	7	3	76	61	96	93	73
Hochrhein	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vispassage Iffezheim: getelde volwassen zalmen sinds het begin van de monitoring in 2000 (n = 867)



200



# Positive effects of passages



Not only salmons, also useful for 'locals':

Vissoort	Wetenschappelijke naam	2008	2009	2010	2011	2012	2013	2014
Zalm	<i>Salmo salar</i>	86	52	18	50	22	4	87
Zeeforel	<i>Salmo trutta trutta</i>	101	66	40	68	20	13	191
Zeeprik	<i>Petromyzon marinus</i>	145	225	23	3	15	0	145
Elft	<i>Alosa alosa</i>	2	0	0	0	0	0	157
Aal	<i>Anguilla anguilla</i>	12.886	8.121	13.681	4.480	4.958	0	6.801
Sneep	<i>Chondrostoma nasus</i>	720	426	370	830	451	313	9.380
Barbeel	<i>Barbus barbus</i>	2.064	1.833	1.383	1.034	2.056	333	5.356
Alver	<i>Alburnus alburnus</i>	726	352	182	145	137	0	20.350
Roofblei	<i>Aspius aspius</i>	2.122	1.590	1.329	773	673	5	3.658
Brasem	<i>Abramis brama</i>	2.941	2.433	3.326	1.517	1.144	5	1.928
Overige soorten		439	383	801	415	722	182	4.013
<b>Totaal</b>		<b>22.232</b>	<b>15.481</b>	<b>21.153</b>	<b>9.315</b>	<b>10.198</b>	<b>855</b>	<b>52.066</b>

Not only fish, also seeds:

- Dutch Institute for Ecology: "Seeds hitch hike kilometres with fish, many more than thought on beforehand"



# Bottlenecks

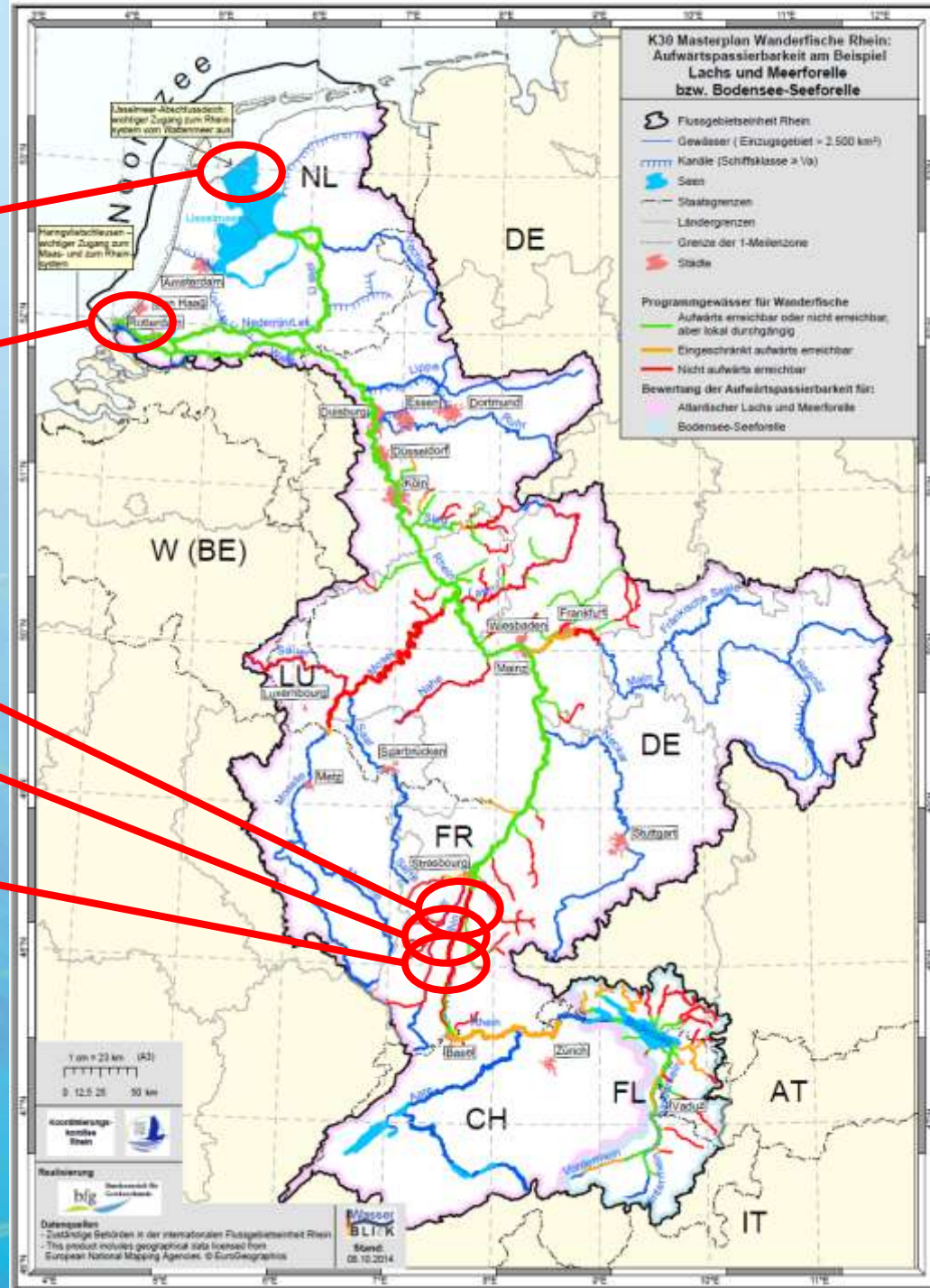
IJsselmeer

Haringvliet

Rhinau

Marckolsheim

Vogelgrün



# Bottlenecks



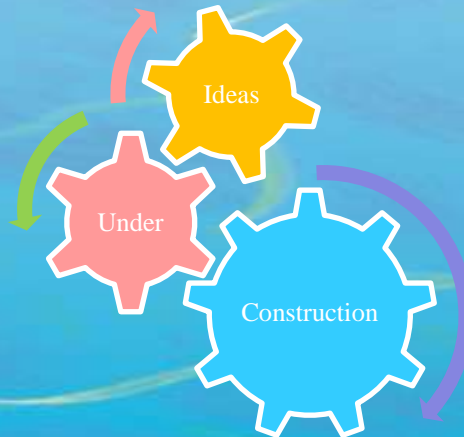
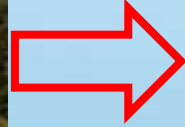
Partial opening Haringvliet



Fish migration river



# Bottlenecks



# Conclusions



- **Water quality is solved, upstream migration is nearly solved, downstream migration is an upcoming issue**
- **Great developments in techniques in the past years: fish passages, methods to deter fish, new turbine designs (0% mortality within reach!), fish behaviour, monitoring, ...**
- **Keep the good work going! Don't despair!**