

Fish migration passages on smaller watercourses: how effective are they?

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Need for free fish migration!

396 REVIEWS

Toward a roadmap for diadromous fish conservation: the Big Five considerations

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Increasing habitat fragmentation is a major contributing factor to dramatic reductions in populations of migratory species world-wide. Diadromous fish species in particular are affected by this anthropogenic disturbance, resulting in historically low population abundances. Despite a plethora of management measures and considerable investment, desired results are often lacking. Here, we highlight five important considerations – the “Big Five” – for diadromous species management: removal of barriers to migration, installation of fish passages, habitat restoration, restocking, and fisheries management. We review current management measures and their effectiveness, and propose a way forward. Current management of diadromous fish populations largely focuses on mitigation of migration barriers, but management will likely fail if other fundamental aspects of diadromous species’ life cycles are overlooked or disregarded. We therefore propose an integrated management strategy that takes into account the five major factors influencing diadromous fish species, with the ultimate goal of restoring their populations.

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Over 200,000 kilometers of free-flowing river habitat in Europe is altered due to impoundments

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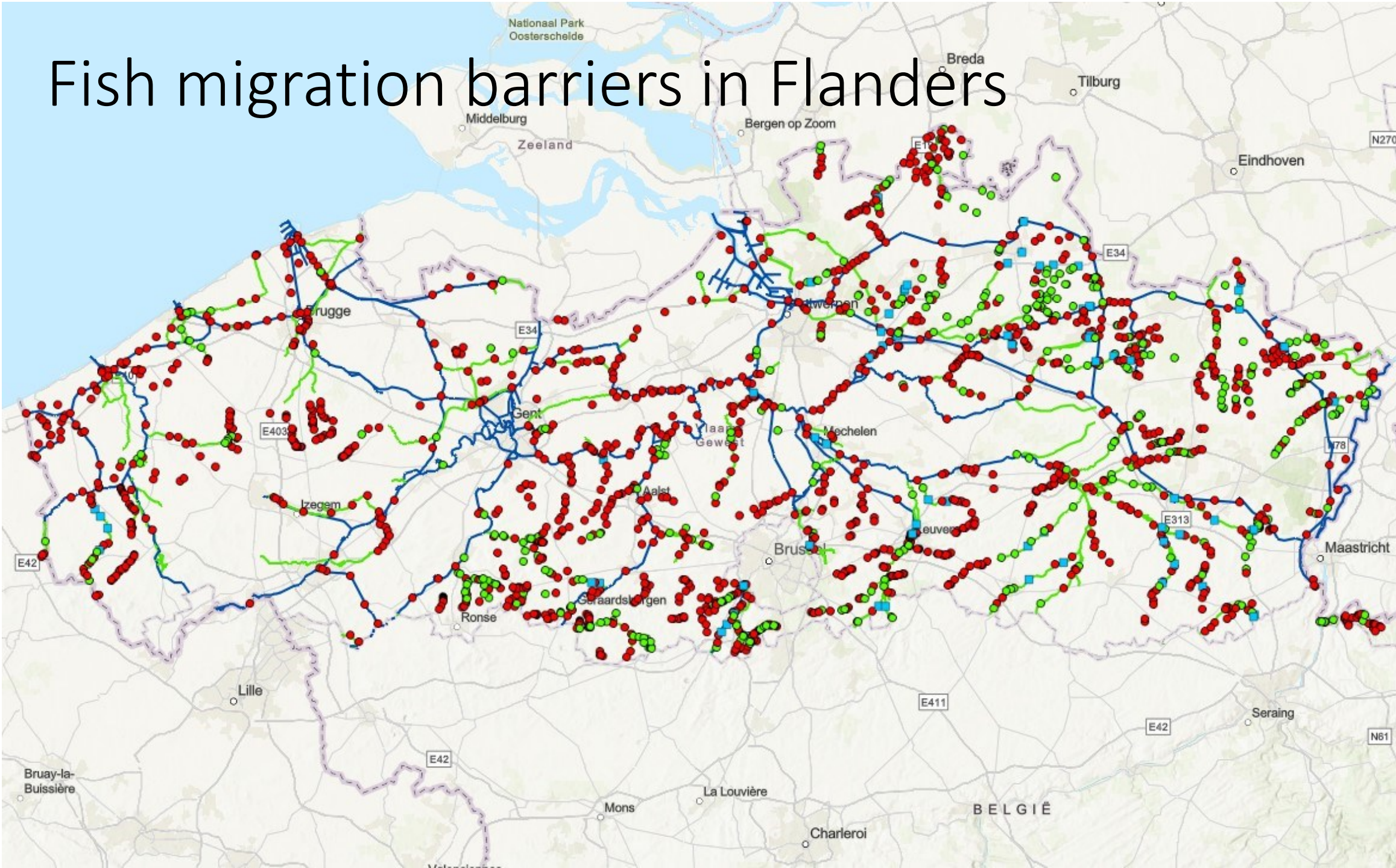
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Solutions to the problem?



How effective are fishways?

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A large-scale passage evaluation for multiple fish species: Lessons from 82 fishways in lowland rivers and brooks

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ORIGINAL ARTICLE



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First published: 11 December 2012 | <https://doi.org/10.1111/conn.12000> | Citations: 122

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Editor: Richard Zabel

Geographical location



Historical context

- Often near old watermills – important heritage
- Cultural landscape
- Importance for nature conservation – hydrological regime/rewetting
- Limited land available

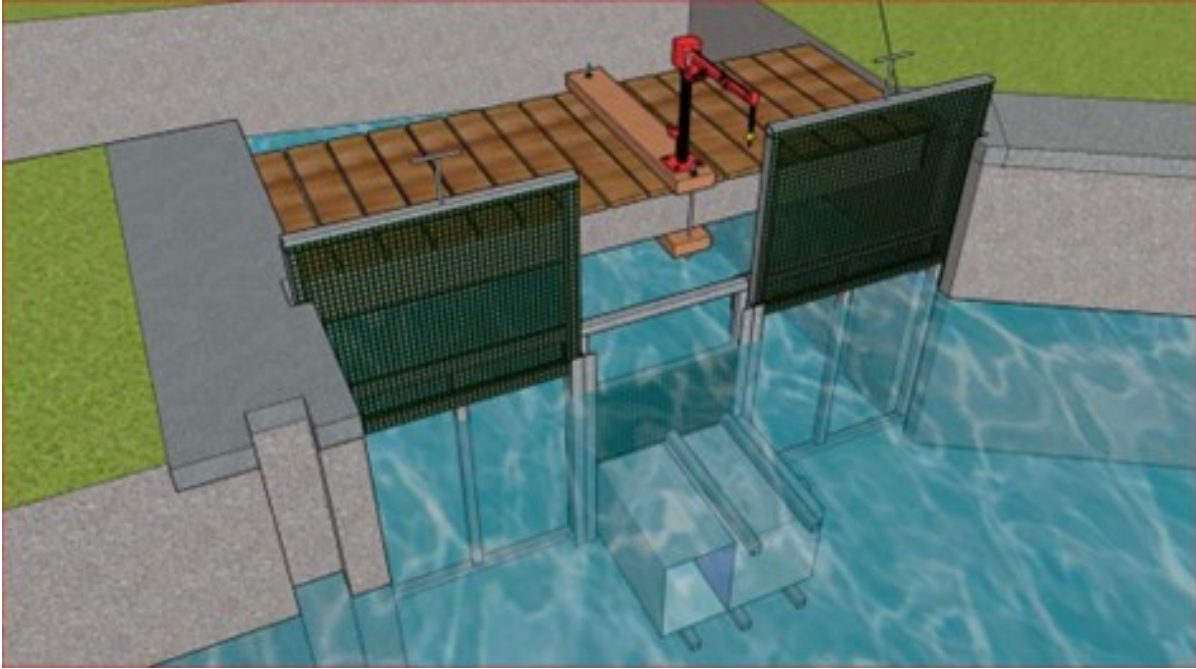
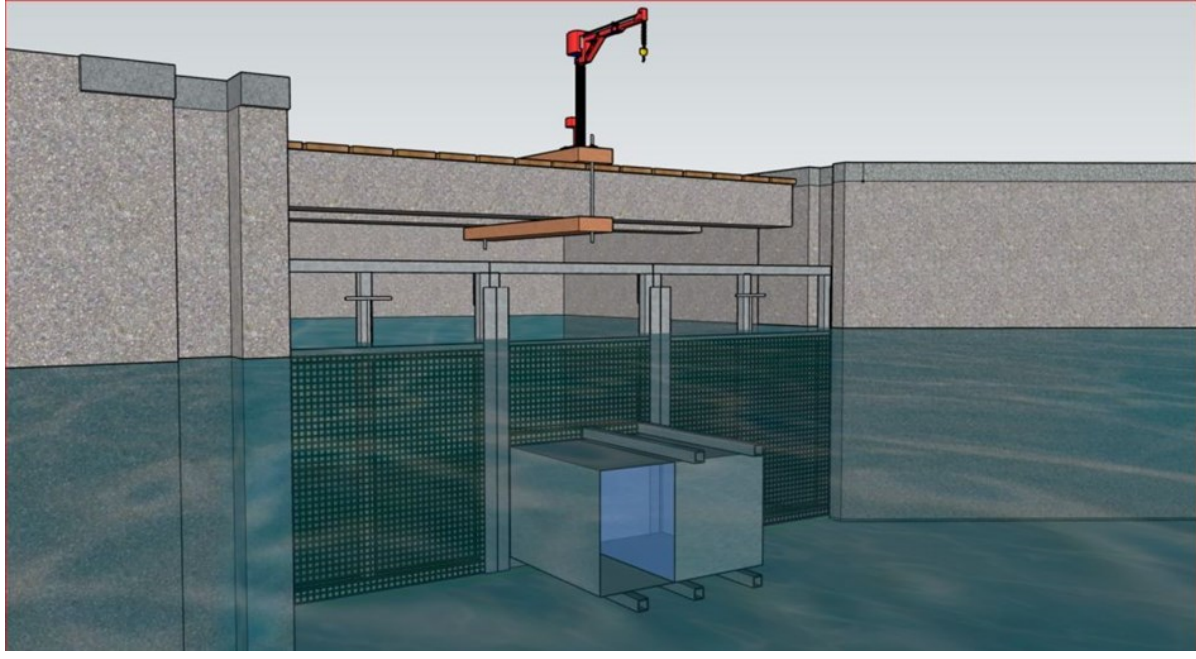


Case study 1: Boembeke mill

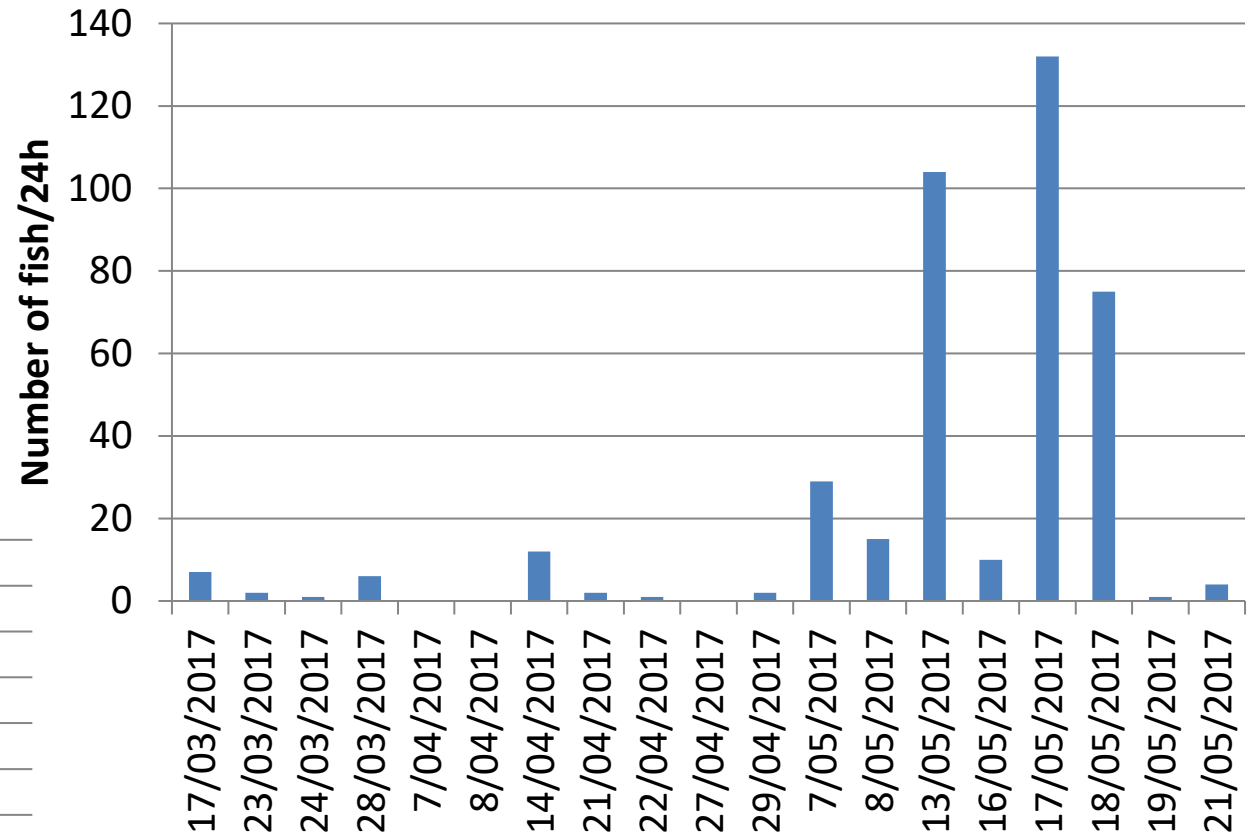
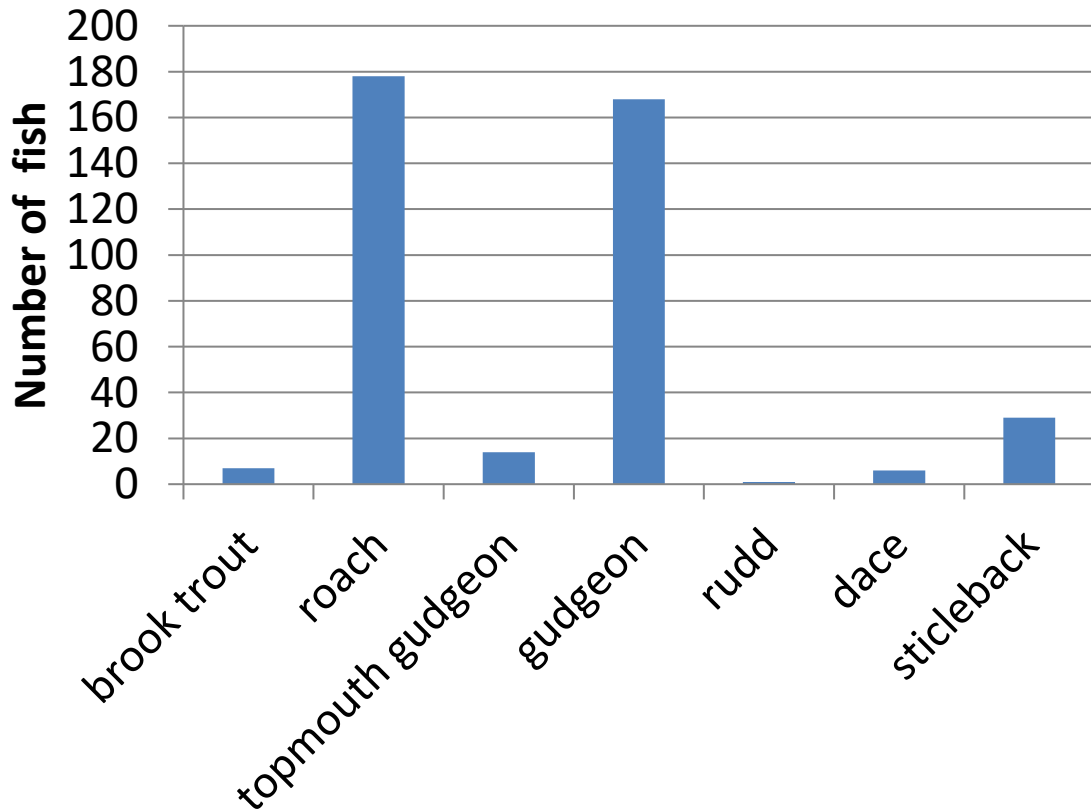
- Technical fishway
- Constructed over 25 years ago
- 150m length – 3m height difference



How did we monitor?

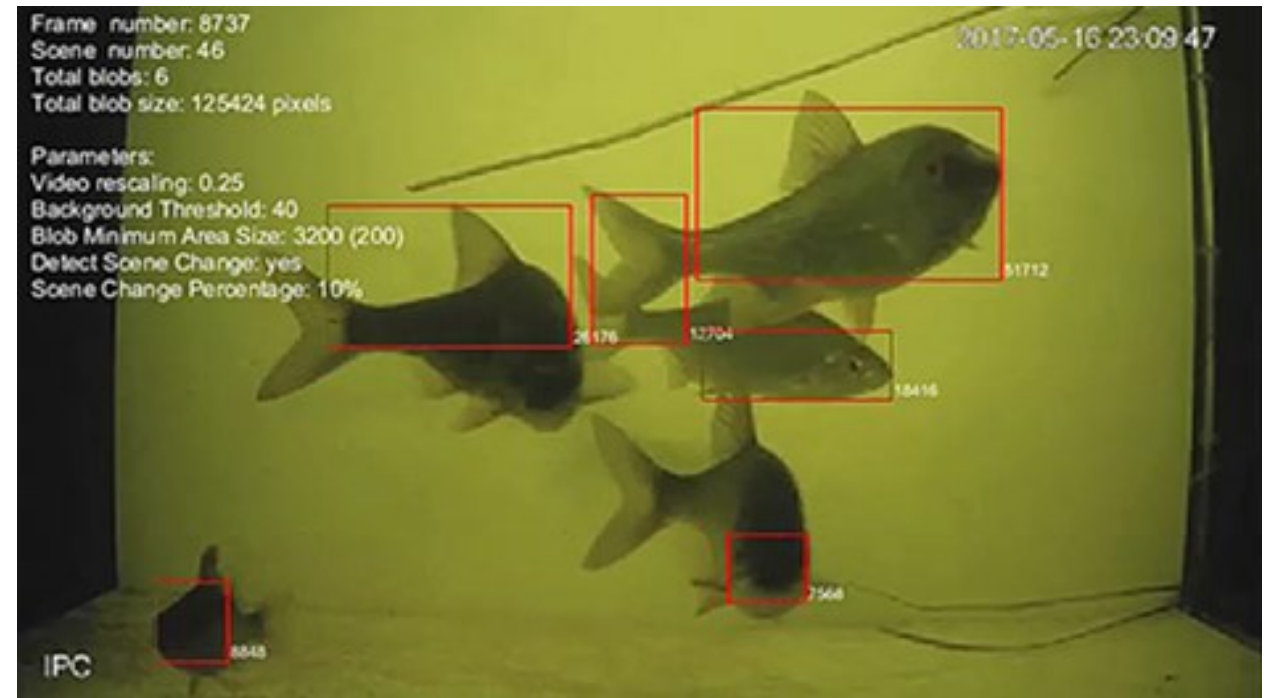


Results (fyke)

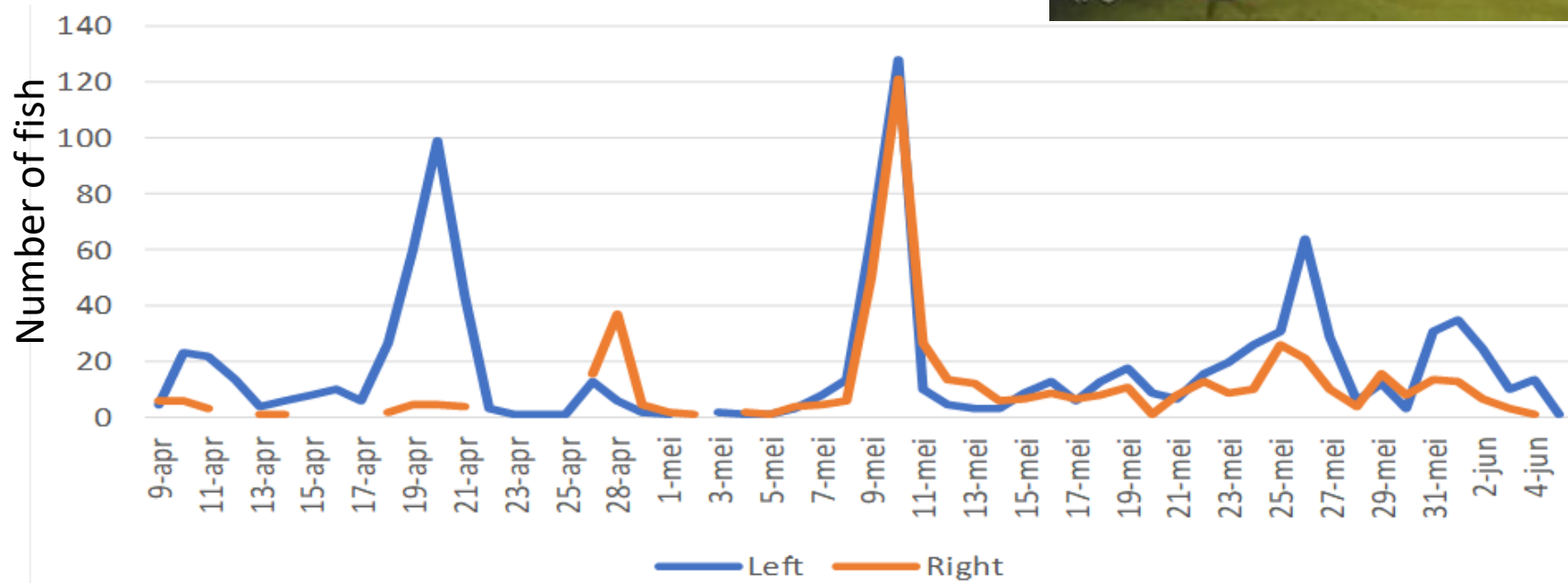


- All species previously recorded species passed the fishway
- Mainly roach and gudgeon (5-15cm)
- Fish must be attracted at entrance and water velocity can not be too high

Results (camera)



Up- and downward migration





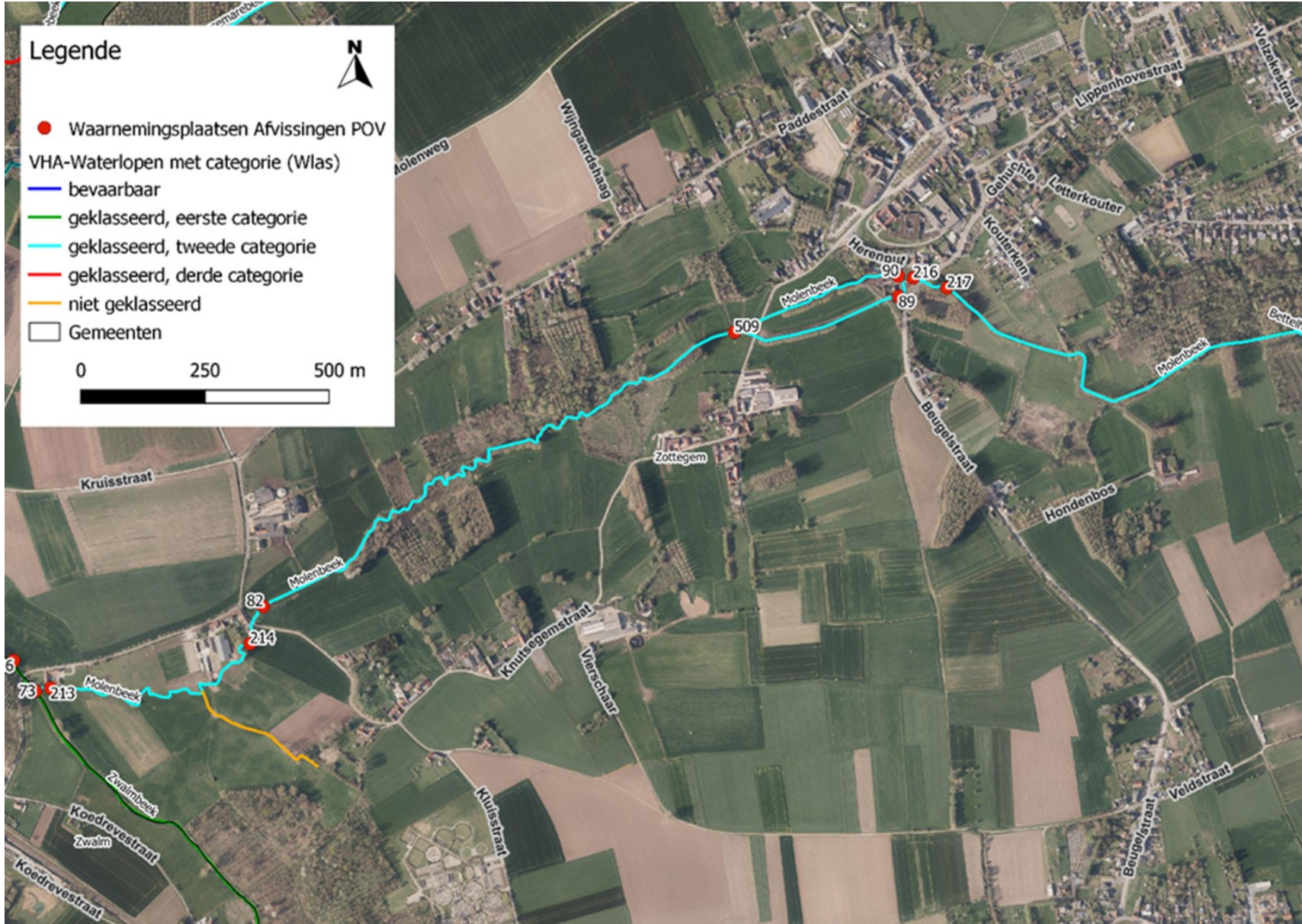
IPC



IPC



Case study 2: Fishway Driesmolen



Before restoration



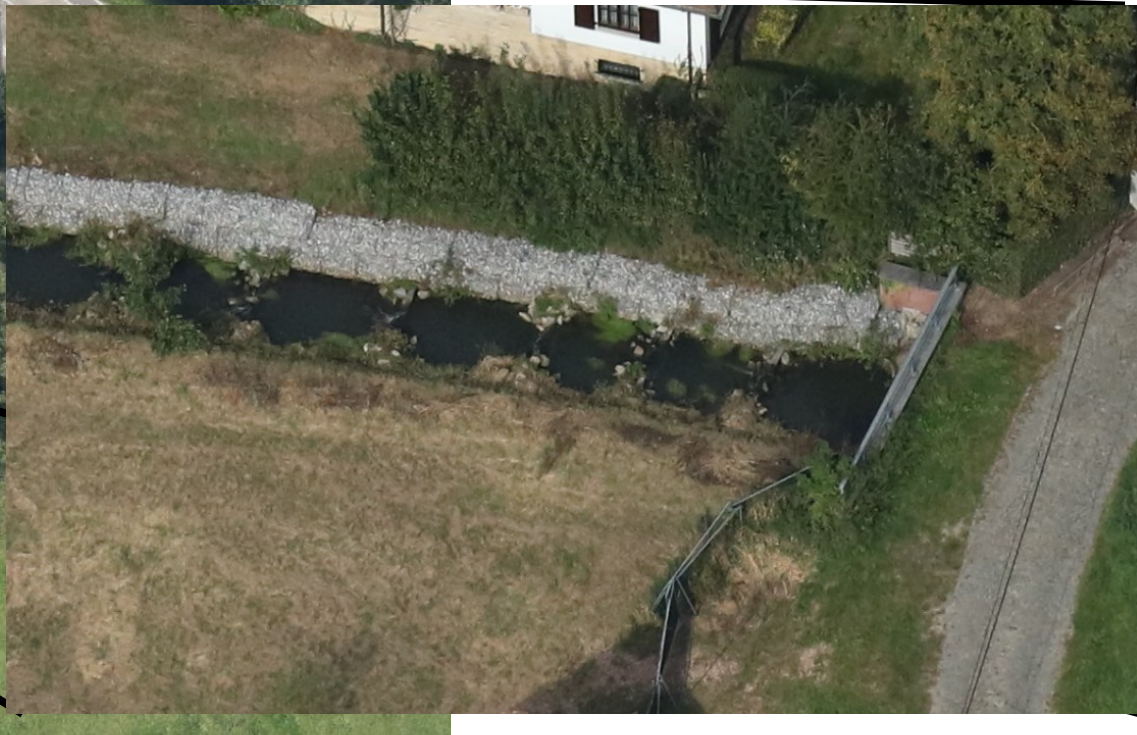
During restoration



After restoration



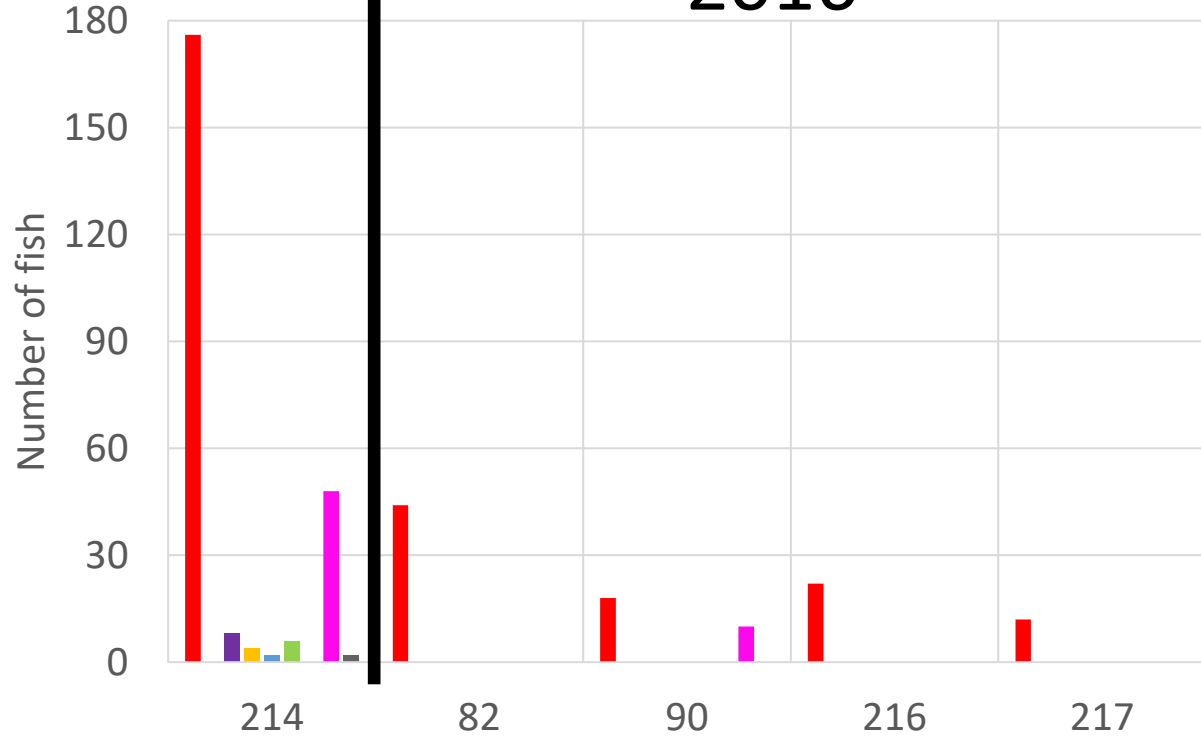
Fishway Driesmolen



Results



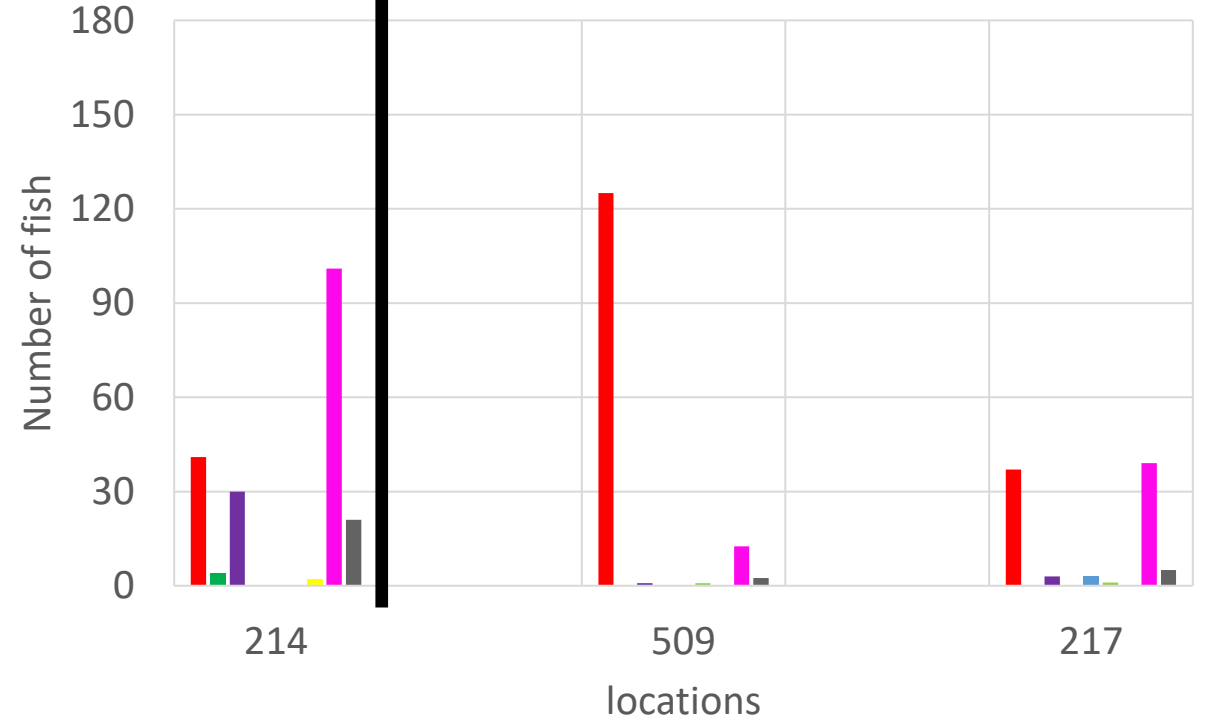
2016



- stickleback
- brown trout
- bitterling
- roach
- Prussian carp
- carp
- chub
- gudgeon
- dace



2020

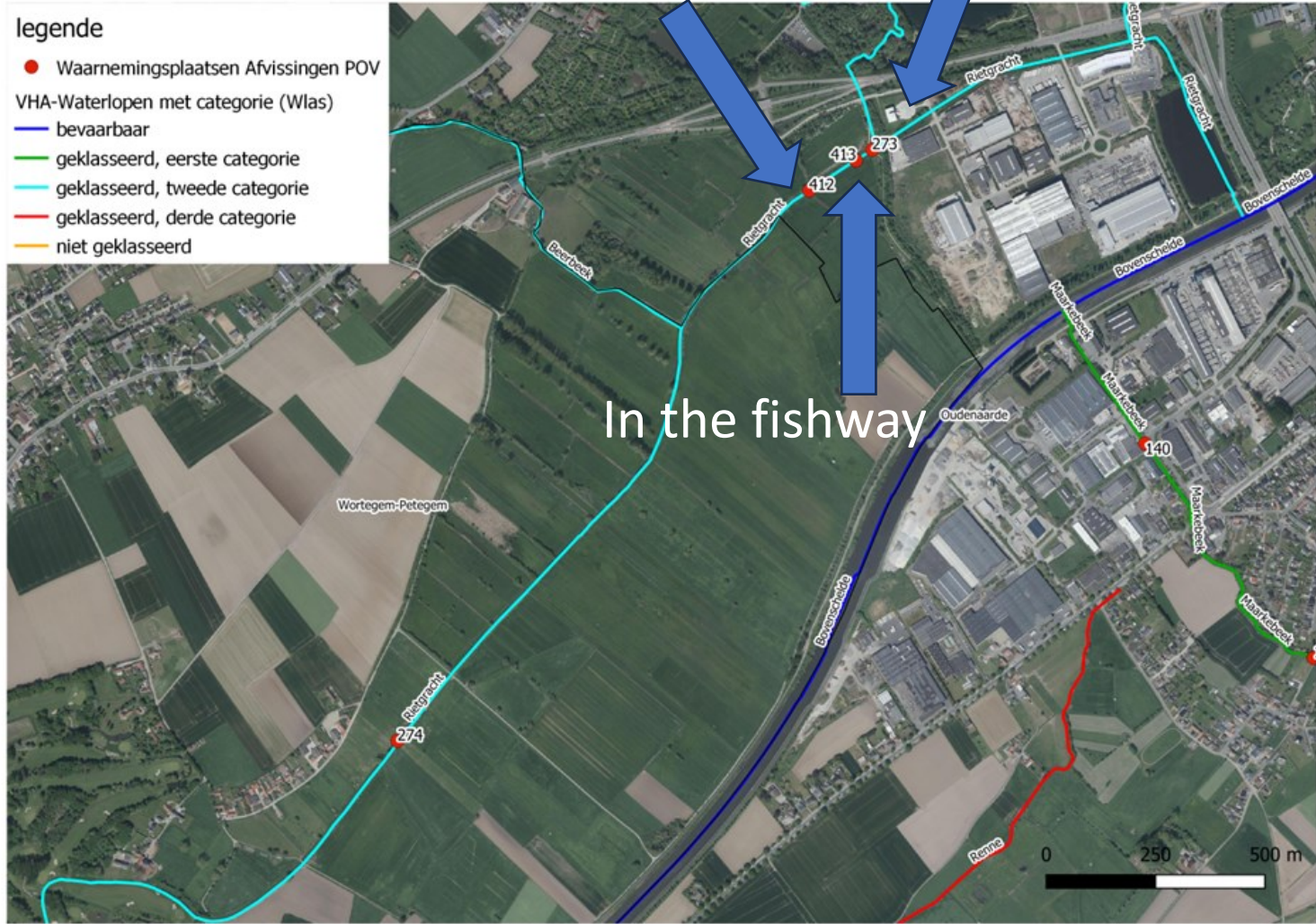


- stickleback
- brown trout
- bitterling
- roach
- Prussian carp
- carp
- chub
- gudgeon
- dace

Case study 3



- legende
- Waarnemingsplaatsen Afvissingen POV
 - VHA-Waterlopen met categorie (Wlas)
 - bevaarbaar
 - geklasseerd, eerste categorie
 - geklasseerd, tweede categorie
 - geklasseerd, derde categorie
 - niet geklasseerd



Results (CPUE)

	Downstream fishway		In the fishway				Upstream fishway	
	fyke		electric		fyke		electric	
	(n)	biomass (g)	(n)	biomass (g)	(n)	biomass (g)	(n)	Biomass (g)
stickelback			1	1.7			1	1.4
perch	14	152.9	1	14.9				
bitterling					1	2.3		
roach	14	106.4	2	2.8	3	67.1	20	107.7
topmouth gudgeon							1	1.6
bream					1	3.1	4	3.4
Prussian carp			4	48.3			9	121.2
eel	1	1225				389		
ruffe	1	7						
pike					1	3926	1	122
sunbleak			1	0.4				
tench			58	974.2	1	1150	43	1397.3

Conclusions

- Fishways are a good solution to provide free fish migration if natural river restoration is not possible
- Both technical as well as more natural solutions seem to work
- Each location is different and fishways need to be tailor-made
- Special attention needs to go to the design and optimisation parameters such as stream velocity, attraction of fish, flow distribution,

