

LIFE-Goodstream

Removal of a migration barrier - effects on invertebrates and fish



Bachelor thesis by Kalle Ström Töttrup and Johannes Glännman

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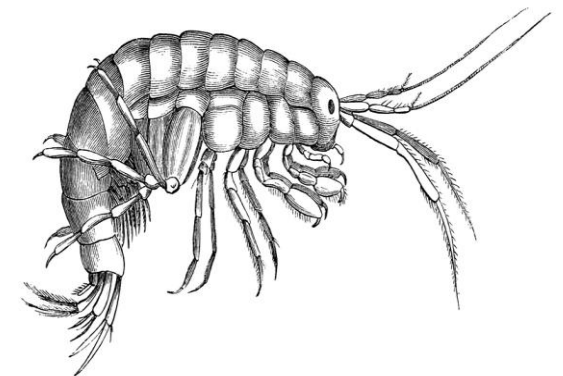
October 2022, LIFE-Goodwater Conference, Riga.

Introduction

- The Rural Economy of Agricultural Societies, Sweden and LIFE-Goodstream
- Inventory of benthic organisms in Trönninge stream with two tributaries
- Inventory before dam removal 2016



Hushållnings
sällskapet



Bentic fauna in streams?



Leeches (Hirudinea)



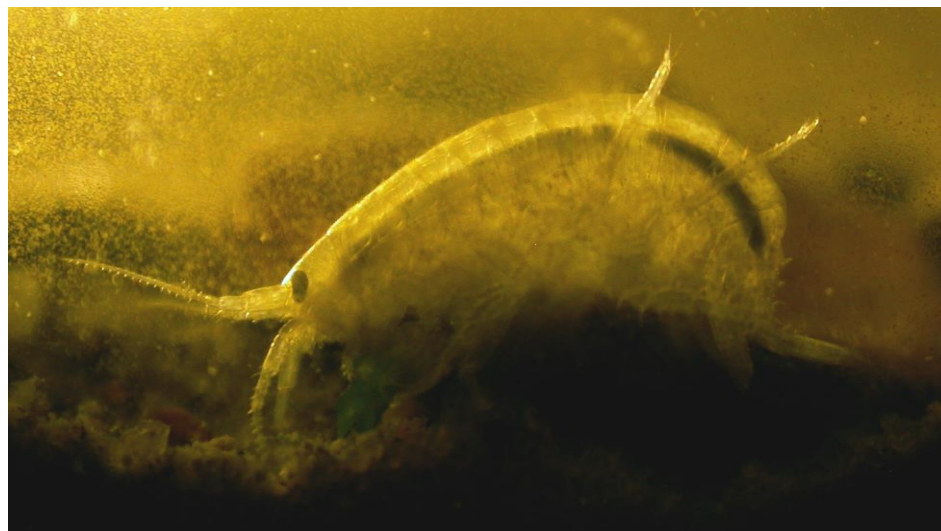
Clams (Bivaldia)



Water louse (*Asellus aquaticus*)



Mosquito larvae (Nematocera)



Freshwater shrimp (*Gammarus pulex*)



Freshwater snails (Basommatophora)



Crane fly larvae (Tipuloidea)

Our focus - EPTO

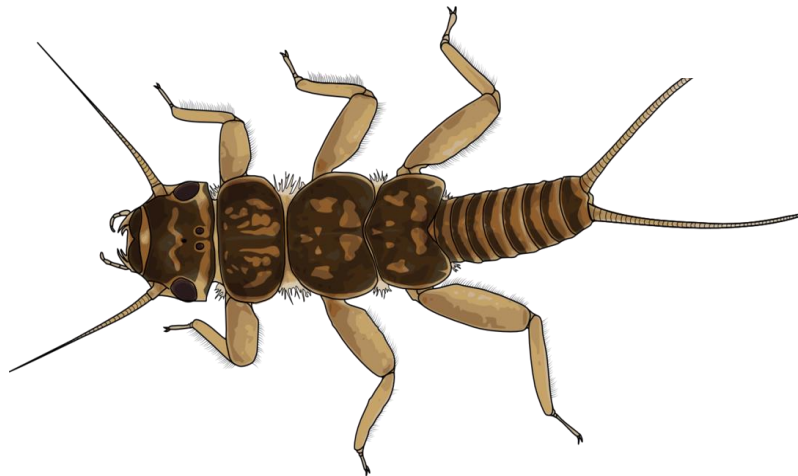


Mayflies
(Ephemeroptera)

Dragonflies
(Odonata)



Caddisflies
(Trichoptera)



Stoneflies
(Plecoptera)



Stjärnarp valley



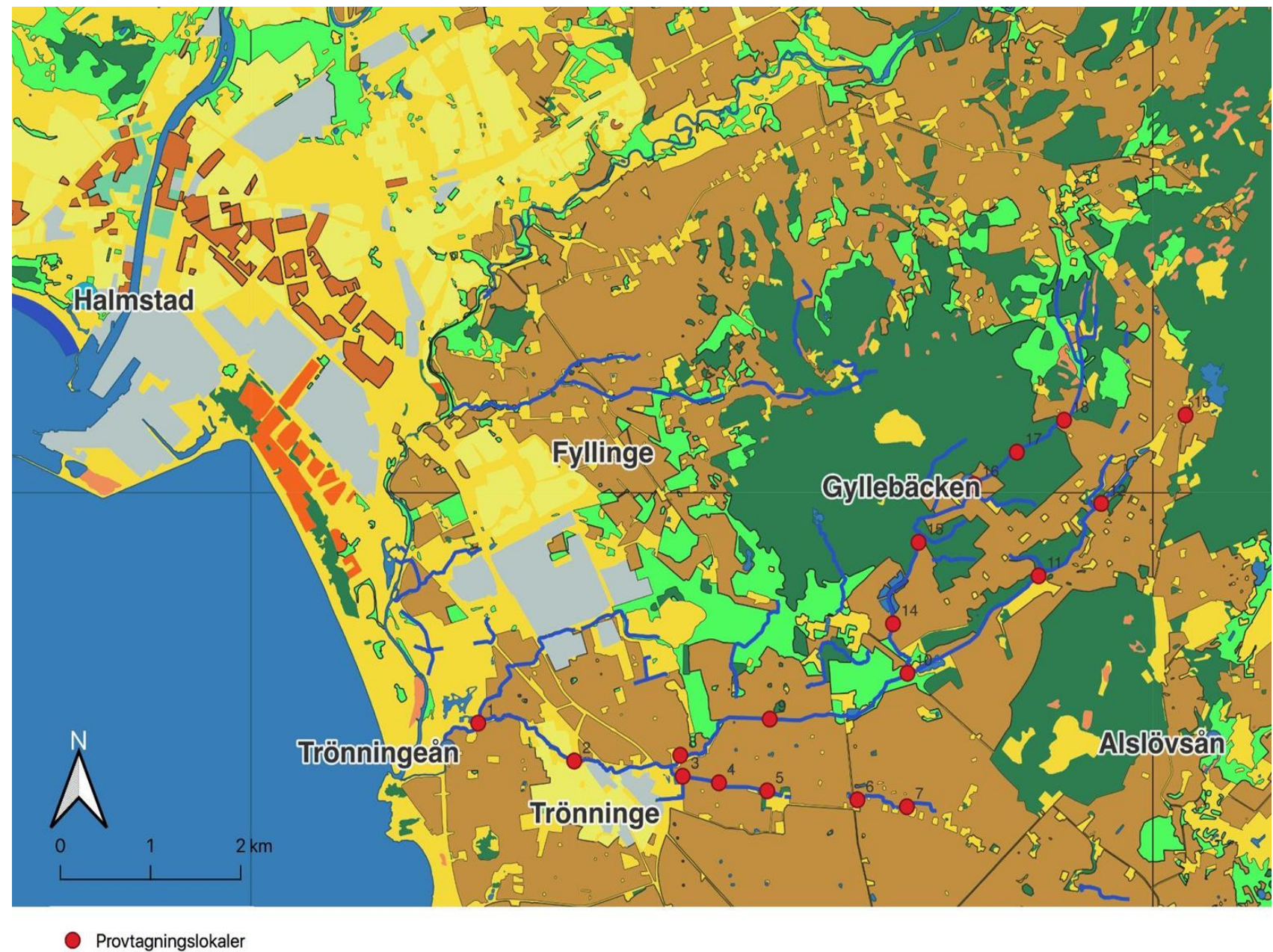
Before



After

Sampling

- The Trönninge stream 8 samples
- Gylle stream and Perstorp stream 5 samples each



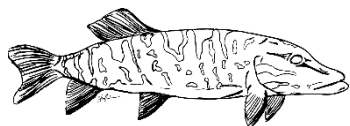
Thesis and questions

- Find out what effect the dam removal had on macroinvertebrates by comparing with earlier inventory – e.g. if the freshwater shrimp had spread upstream the old barrier?
- Status of the species composition of Mayflies, Dragonflies, Stoneflies and Caddisflies at the moment (March, 2022) and what environmental factors effect this composition in these streams?
- Suggestions for suitable conservation measures in the researched area



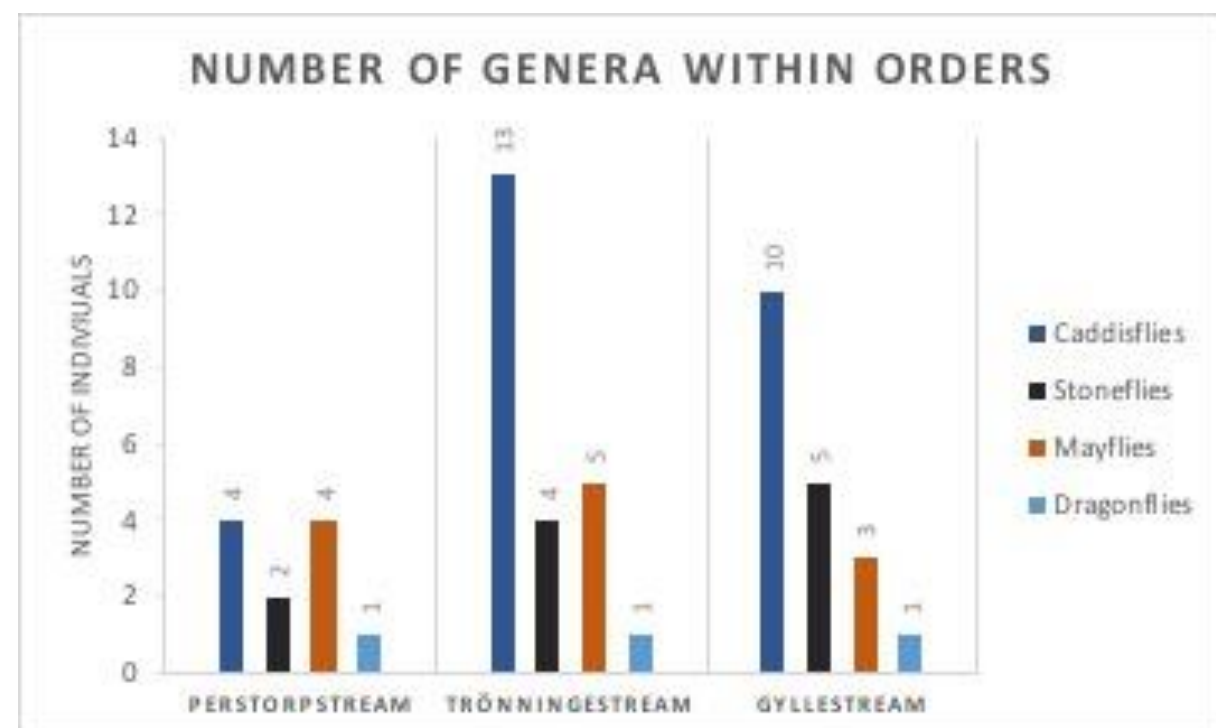
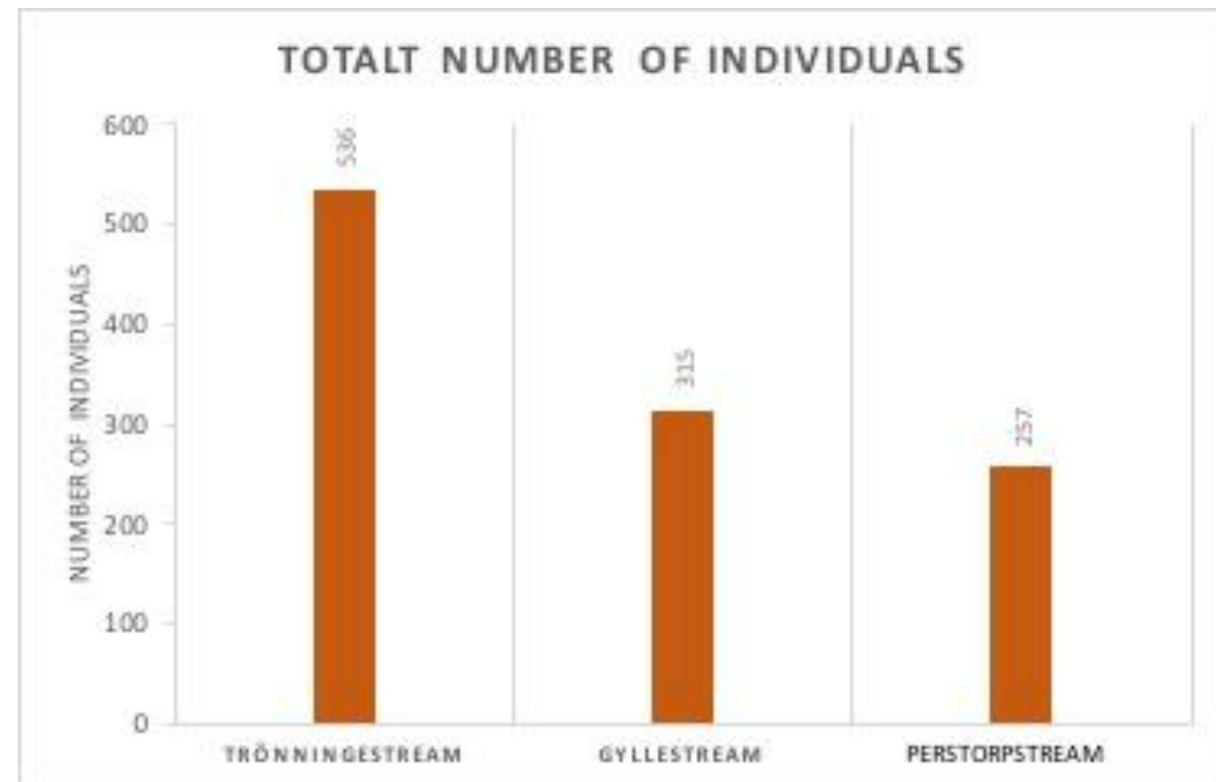
Materials and methods

- Kick-sampling method
- Width, depth, bottom substrate, velocity, riparian zone och adjacent environment
- ASPT, Shannon's diversity index and SPSS



Result from inventory

- Trönninge stream 23 genera and 536 individuals
- Gylle stream 19 genera and 315 individuals
- Perstorp stream 11 genera and 257 individuals
- Caddisflies most numerous in 2 of 3 streams



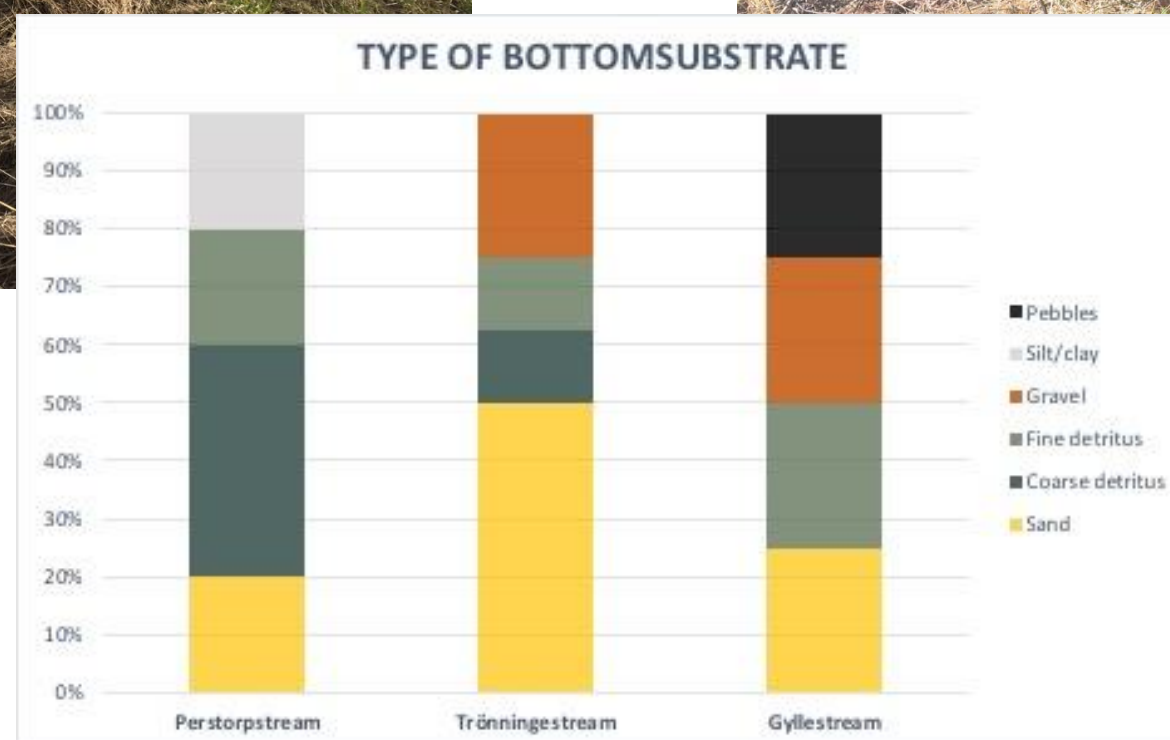
Results from inventory



Perstorp
stream

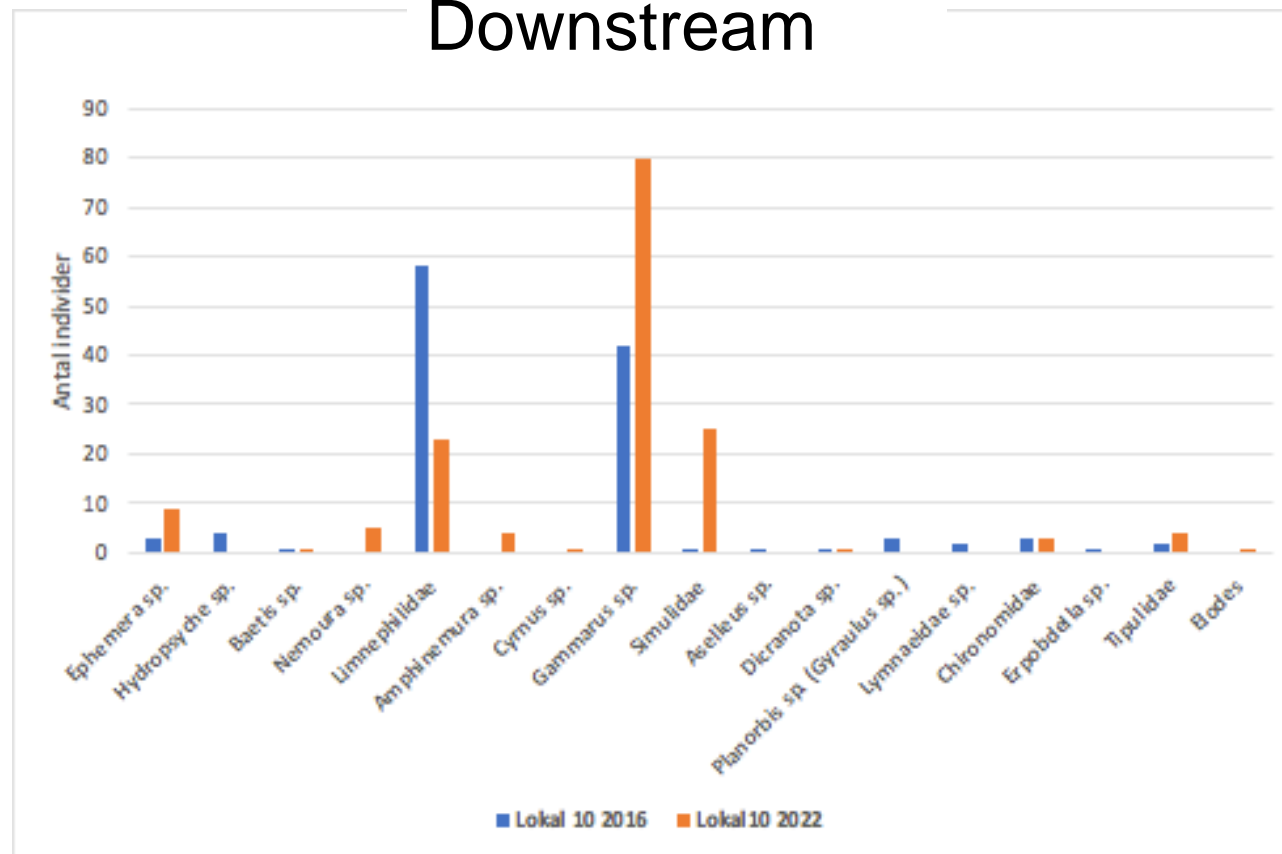


Trönninge
stream



Result from re-inventory

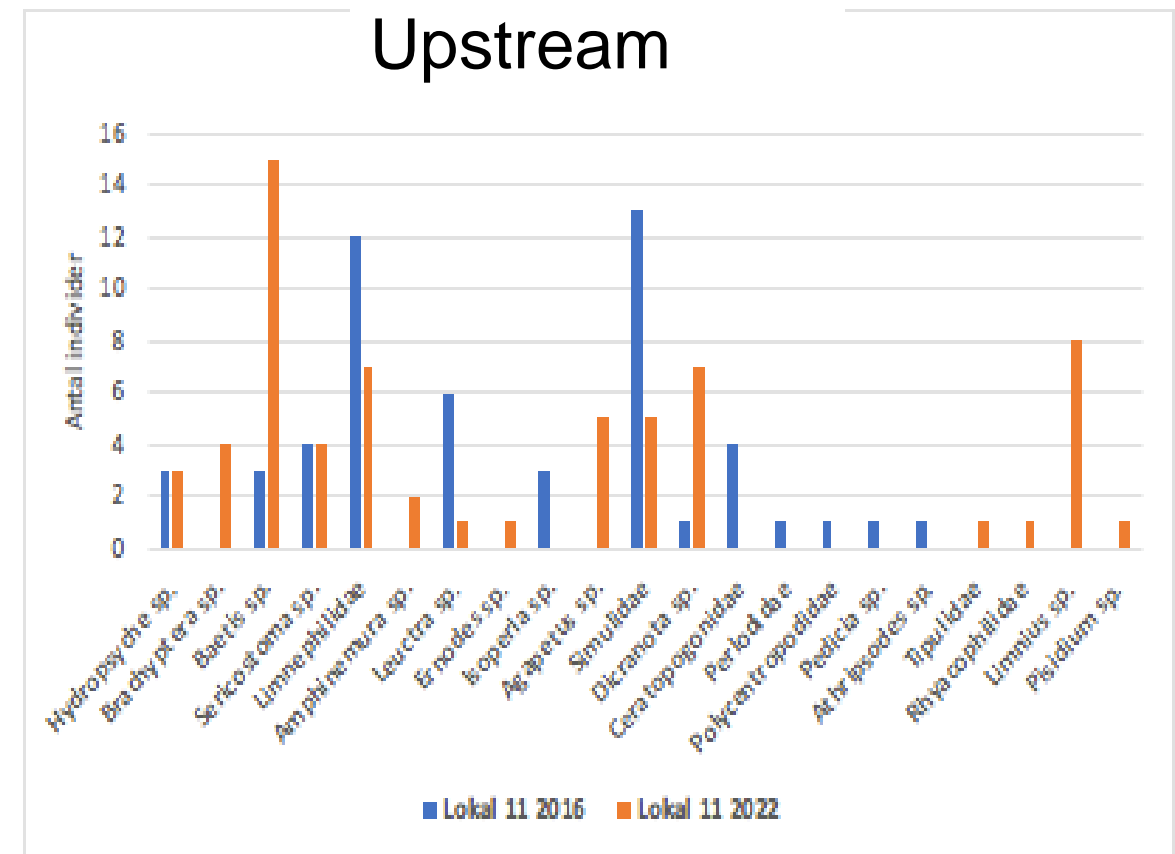
Downstream



ASPT 2016 = **Low**
ASPT 2022 = **High**

Shannon diversity
low status both
years ca $H=1,40$

Upstream



ASPT 2016 = **Medium**
ASPT 2022 = **High**

Shannon diversity
medium status both
years ca $H=2,30-2,40$



Results from the re-inventory



- There was a change in bottom substrate downstream the old dam from **mud** → **sand/gravel**.
- Shift in species composition
+ **demanding species**
- **mud-living species**
- The freshwater shrimp has not migrated upstream...**yet**

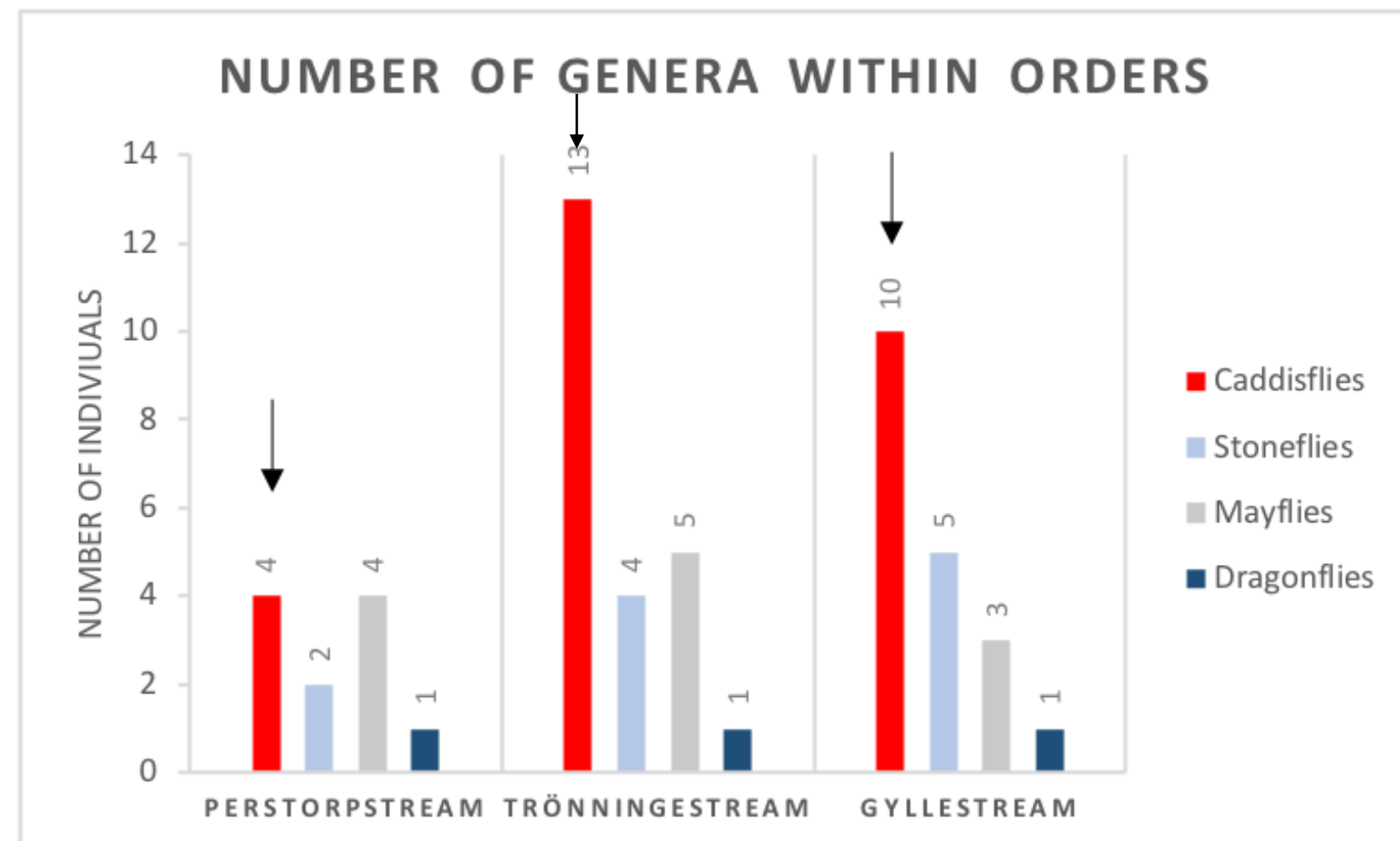


Downstream the old damm

Caddisflies



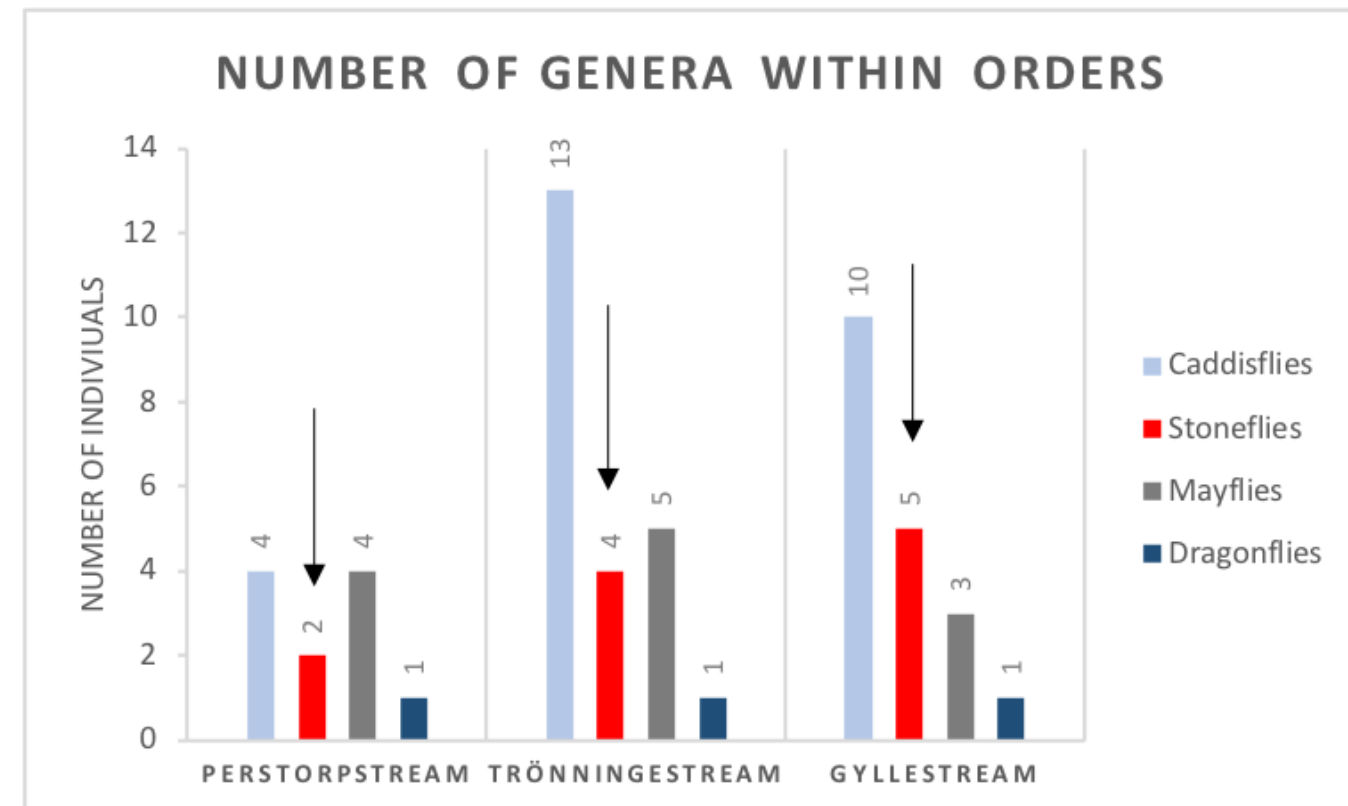
- Most species rich order
- Riparian zone might affect result
- 10 out of 13 sampling locations in Trönninge stream and Gylle stream is dominated by trees
- Only 1 out of 5 sampling locations in Perstorp stream
- Trees crucial for water temperature and food



Stoneflies



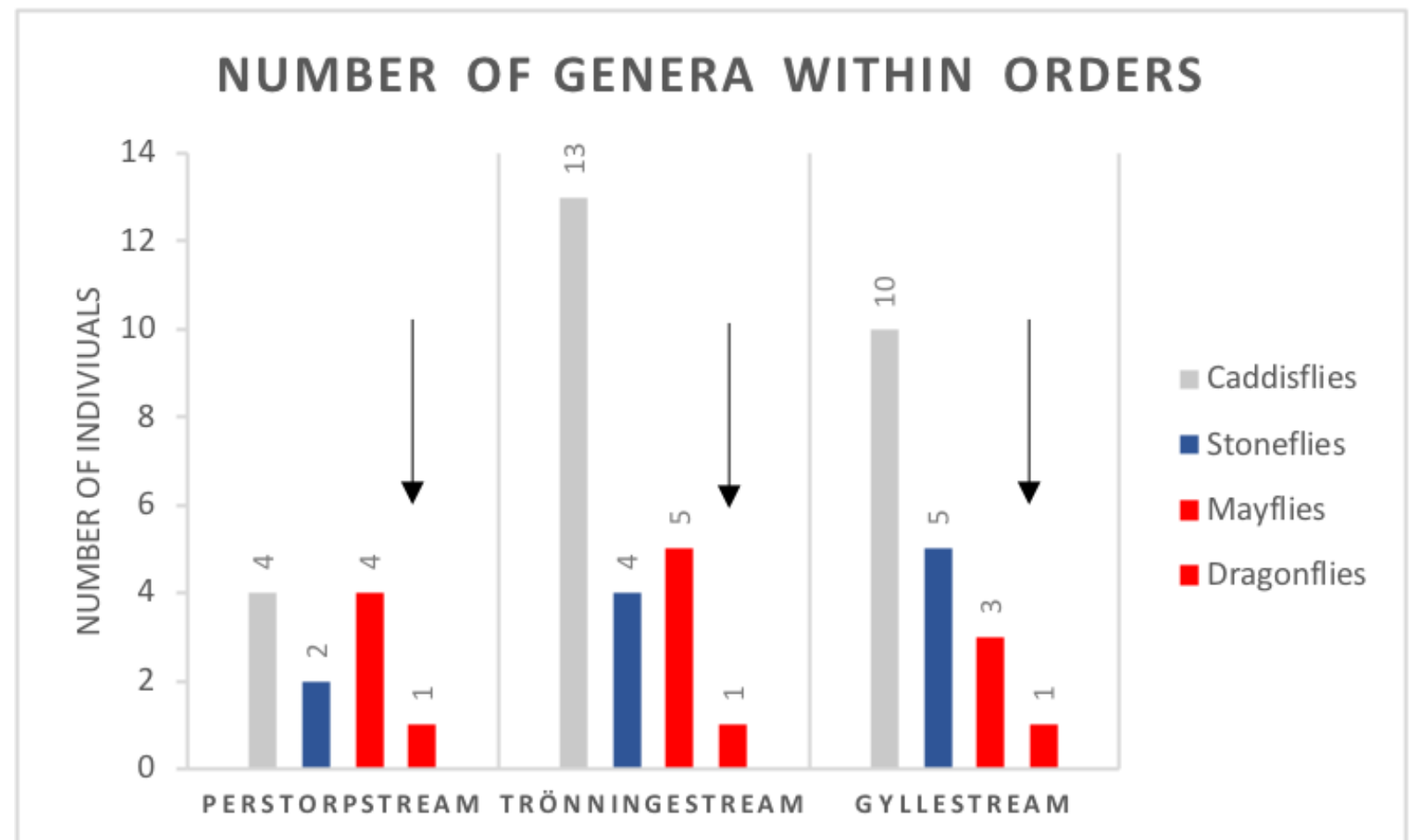
- Prefer more flowing water
- Suitable substrate for last imagio
- Only 4 out of 257 individuals in Perstorp stream -
Gylle stream 185 out of 315 individuals



Mayflies and dragonflies



- Dragonflies was the least represented order – only two species (Common goldring and White-legged damselfly)
- Few mayfly genera but many individuals



Conservation measures

- Re-meandering upstream the old damm enriches habitat diversity which both benefits benthic invertebrates and fish
- Riparian zones with tree cover can lead to natural meandering or with boulders for faster results
- Studies from Denmark and England show that dispersion of freshwater shrimp benefits fish



Conclutions

- Big effect from dam removal → Better water quality with more demanding species
- An overview of the EPTO orders in Trönnige stream
- What is affecting the species composition
- Suggestions for conservation measures within the researched area
- New information that hopefully will lead to more research or projects with the Rural Economy of Agricultural Societies, Sweden



Thank you!

Thank you!

Come visit us in Sweden or read more at:
www.goodstream.se



Brown trout
(*Salmo trutta*)



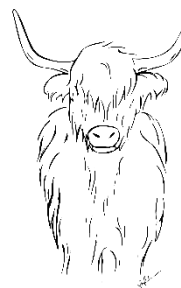
Brook lamprey
(*Lampetra planeri*)

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Read more about our wetland projects: biowetland.se



Hushållnings
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The Rural Economy of Agricultural Societies



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myndigheten



Stiftelsen C R Prytz donation

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