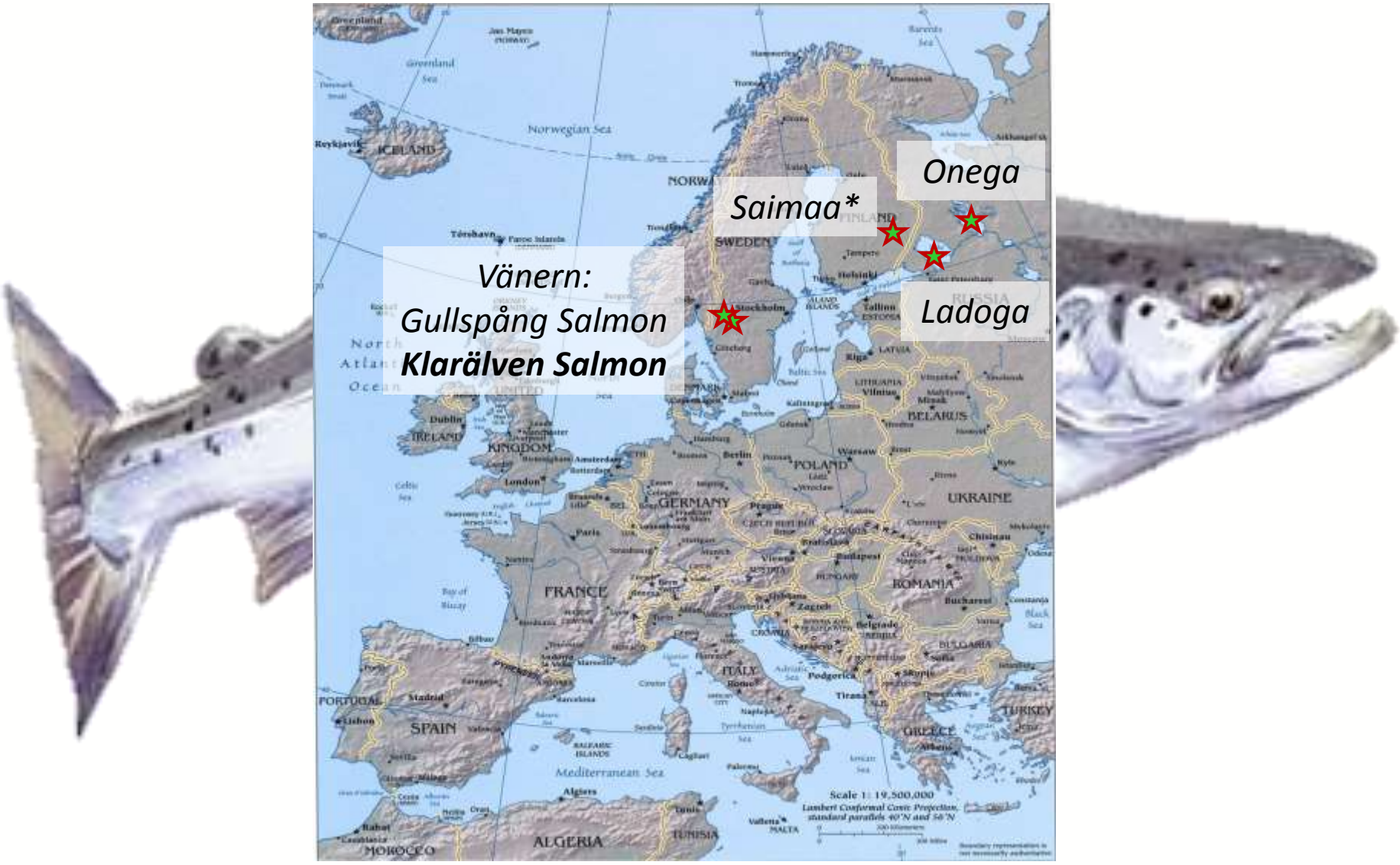
Vänerlaxens Fria Gång

”free” migration for the Vänern salmon

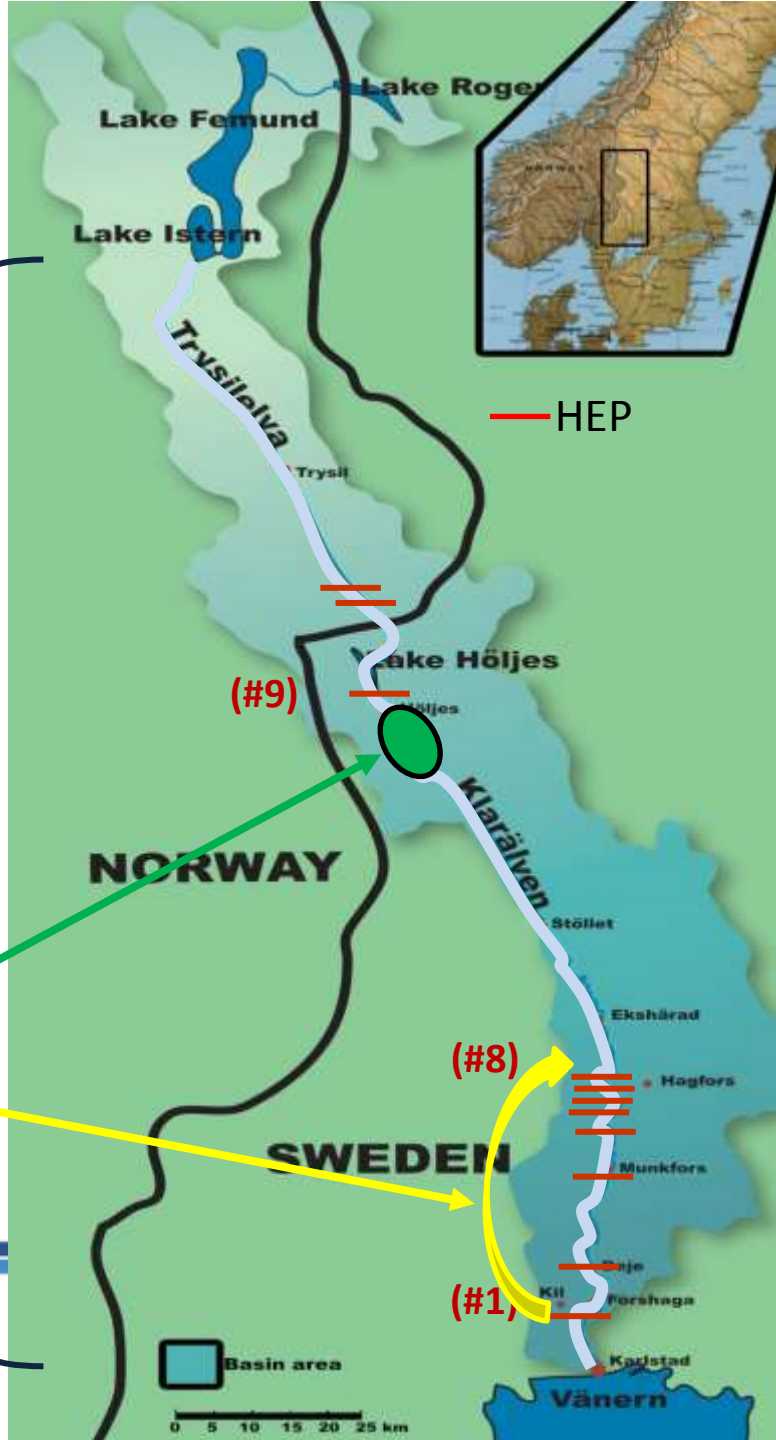
Remaining stocks of large *freshwater* salmon in Europe



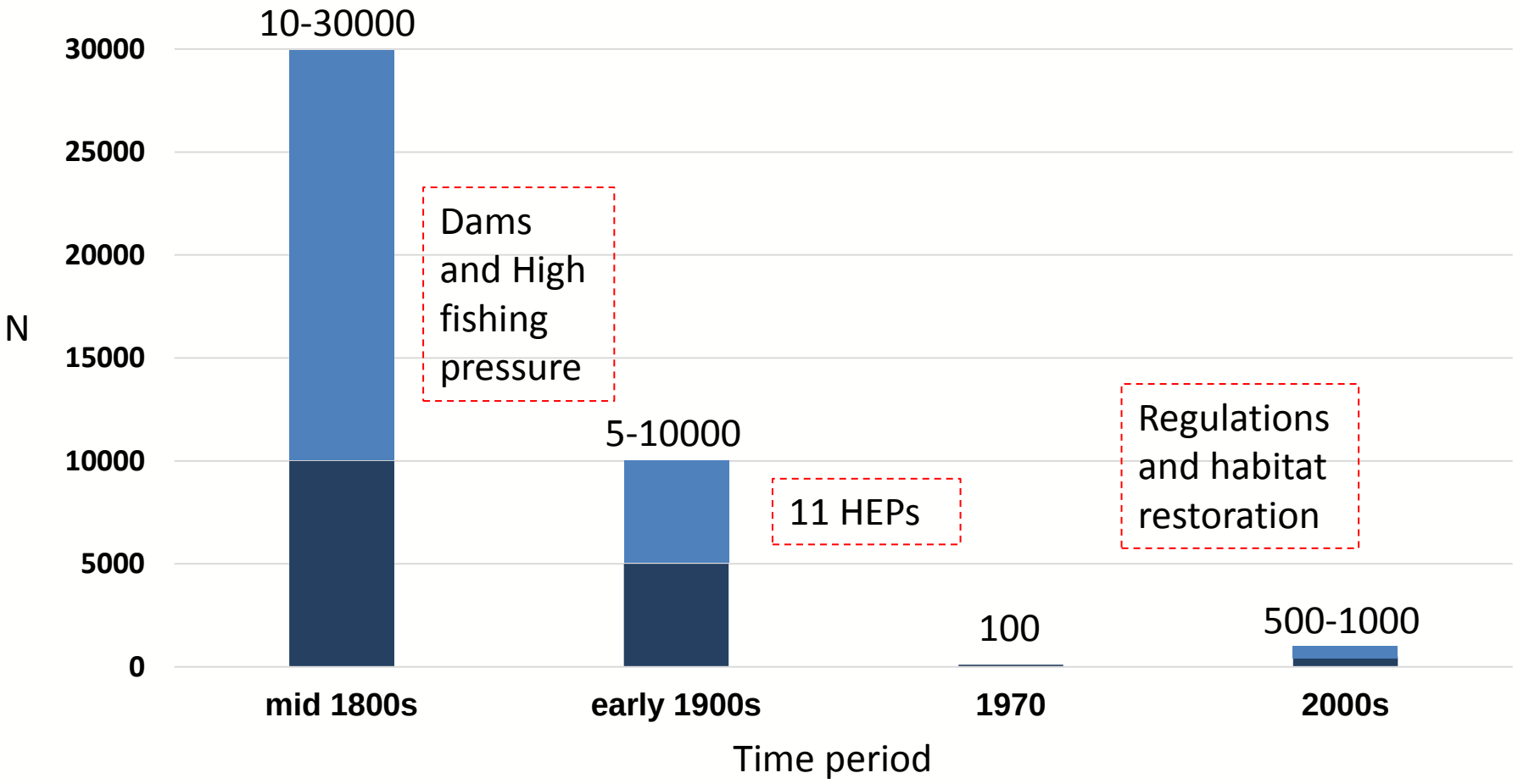
Värmland County
Administrative Board

River Klarälven/Lake Vänern salmon

- Freshwater living - Habitat directive 92/43/EEG
- Large size (20 kg)
- Spawning migration – historically up to 400 km
- 9 + 2 HEPs (1906-1964)
- Trap & transport since 1931
- Spawning area today



Catches of wild Klarälven salmon in River Klarälven during the past 150 years – *rough numbers*



What can be done to increase the salmon's range and number?

Vänerlaxens Fria Gång

- Agreement between Sweden's and Norway's Ministers of Environment in 2010
- EU/Interreg-project Sweden-Norway 2011-2015
- **30 organizations:** Municipalities, universities, national authorities, consultants, hydro power companies, regional fishing boards etc.
- **Budget:** 3 million EURO

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Purposes

- *Good Ecological Status* (Water Framework Directive: 2000/60/EG)
- *Favourable conservation status* (Habitat directive: 92/43/EEG)
- *Sustainable development* - environment, tourism, local business

Objectives

- Investigate the salmon and River Klarälven/Trysilelva as salmon river today
  - *Ecology*
  - *Genetics*
  - *Habitat*
  - *Identify bottlenecks*
- Estimate the potential for salmon in River Trysil/Klarälven today and tomorrow
- **Presenting actions**

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Some results










Upstream migration: How effective is the salmon trap at Forshaga HEP?

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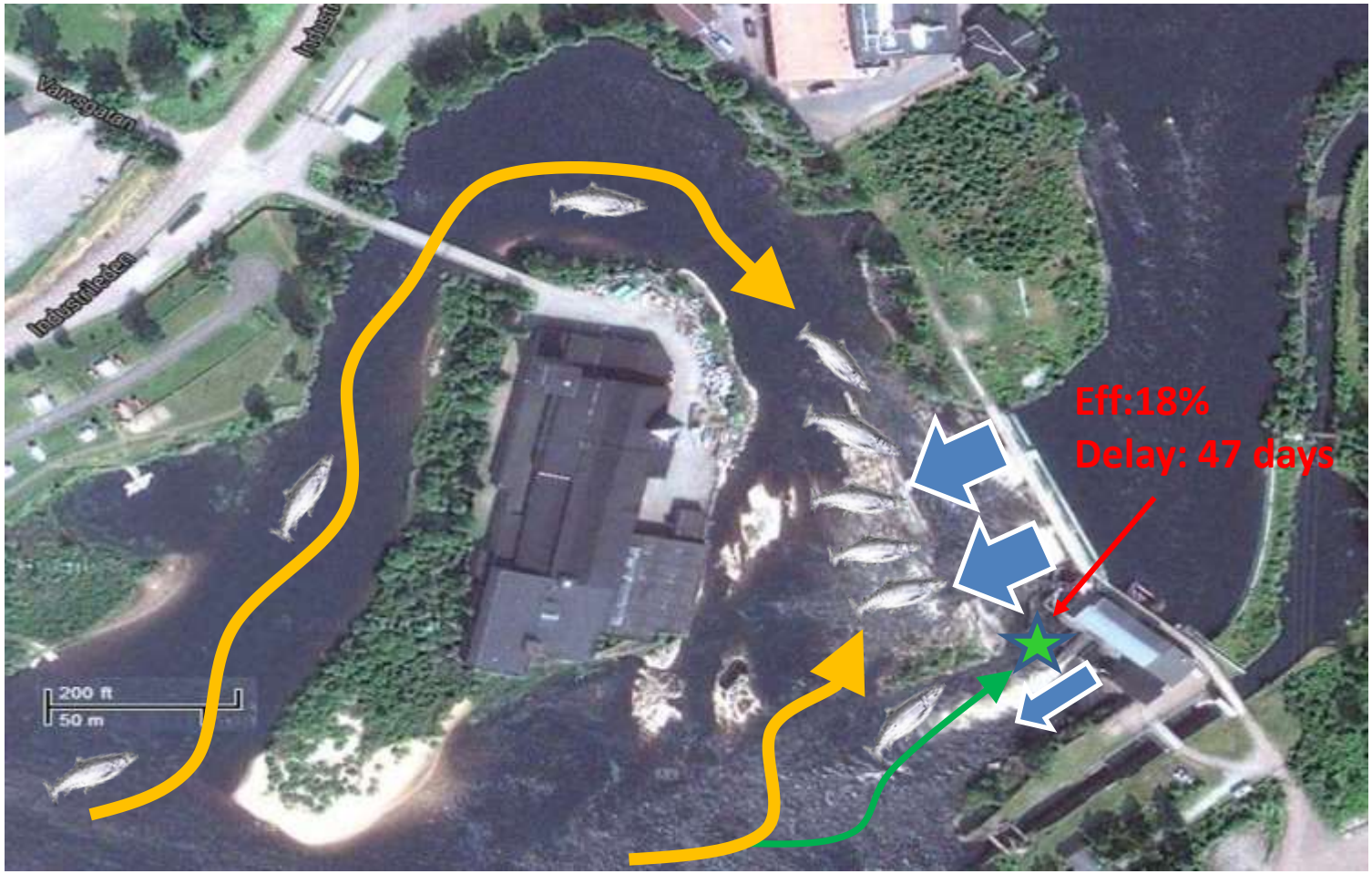
Radio-telemetry: Lake Vänern – Forshaga HEP 2012

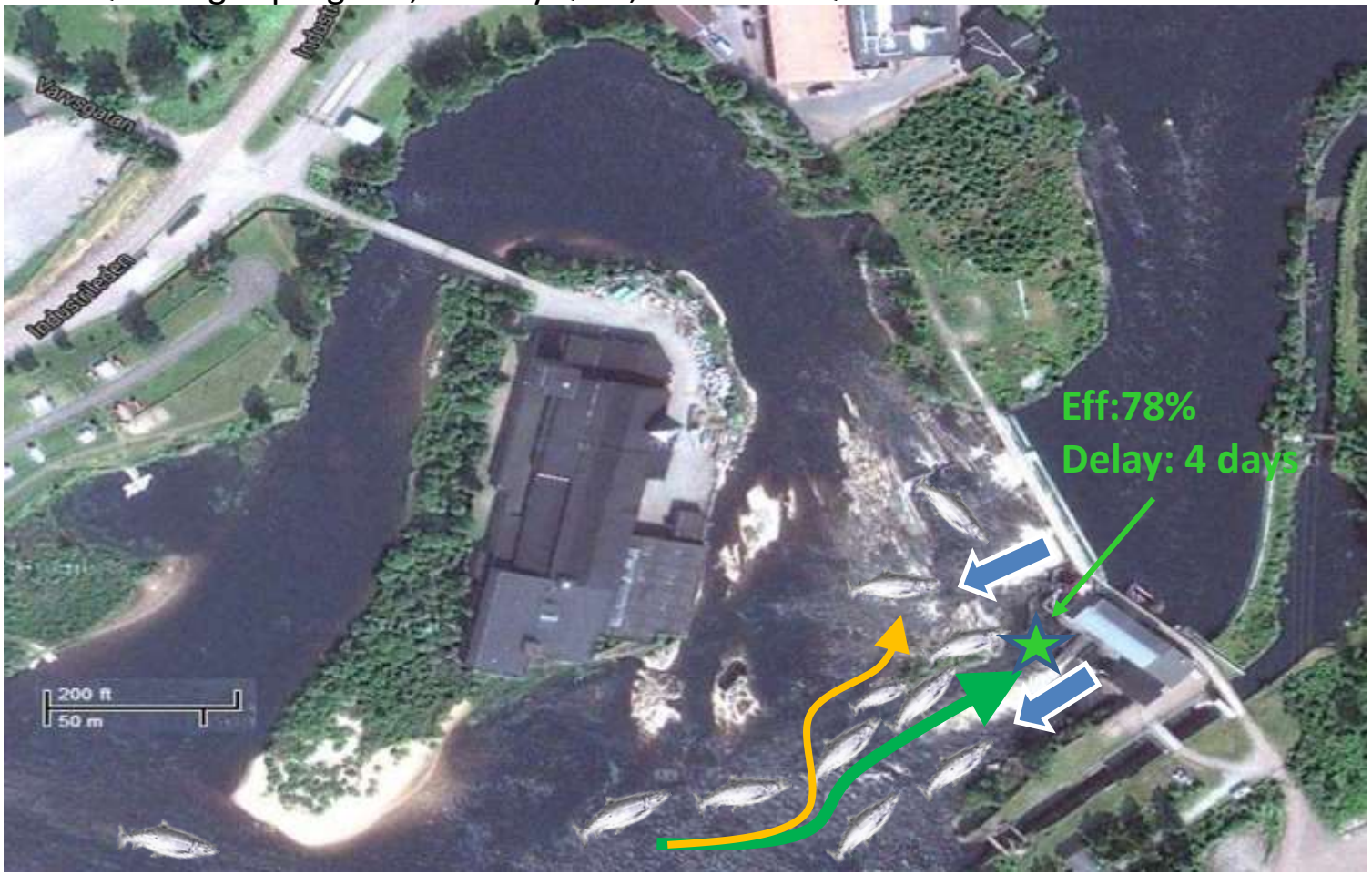
High Q through spill gates, fishwayQ = 1,5% of totalQ)



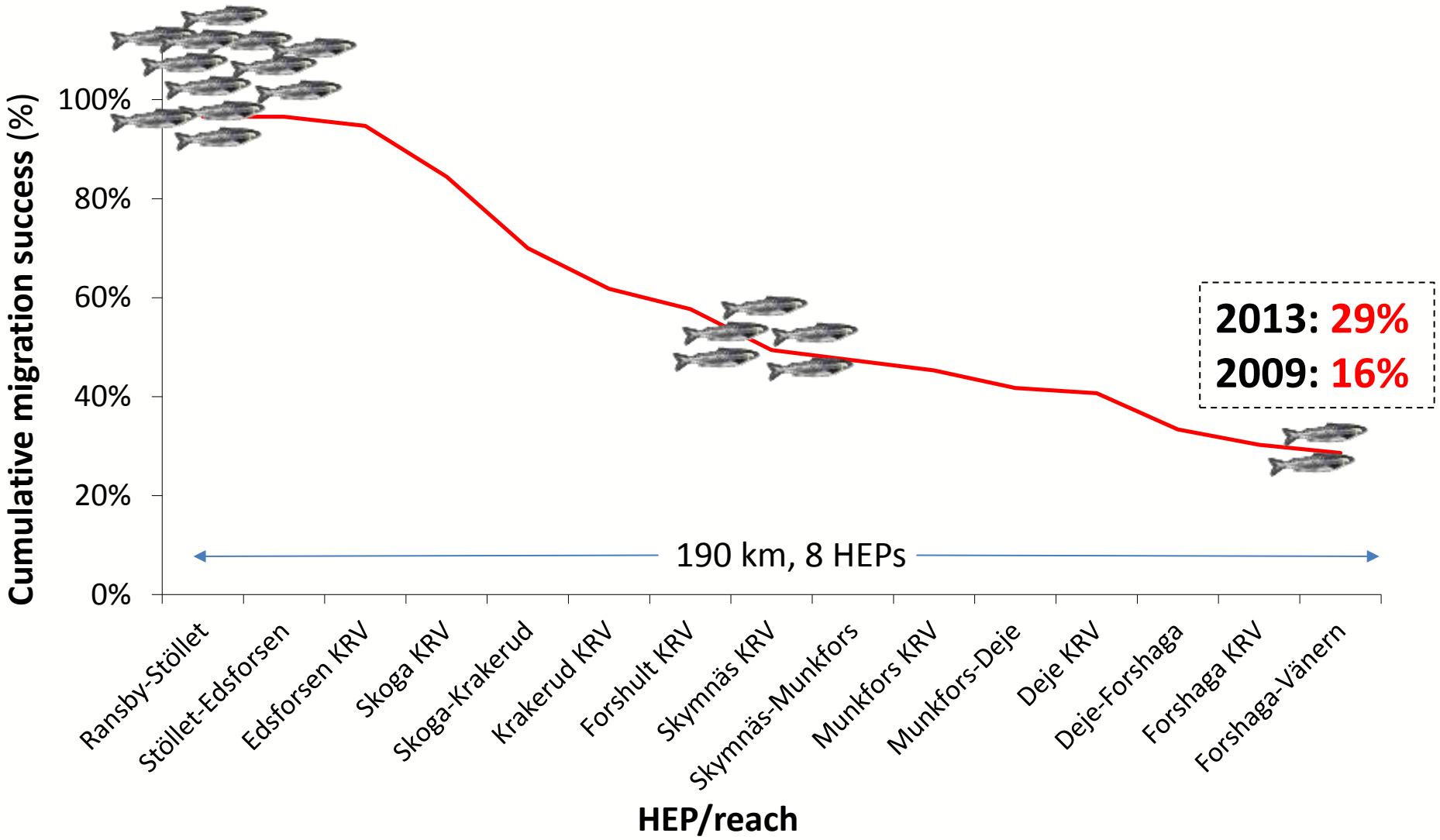
Upstream migration: How effective is the salmon trap at Forshaga HEP?

Radio-telemetry: Lake Vänern – Forshaga HEP 2013

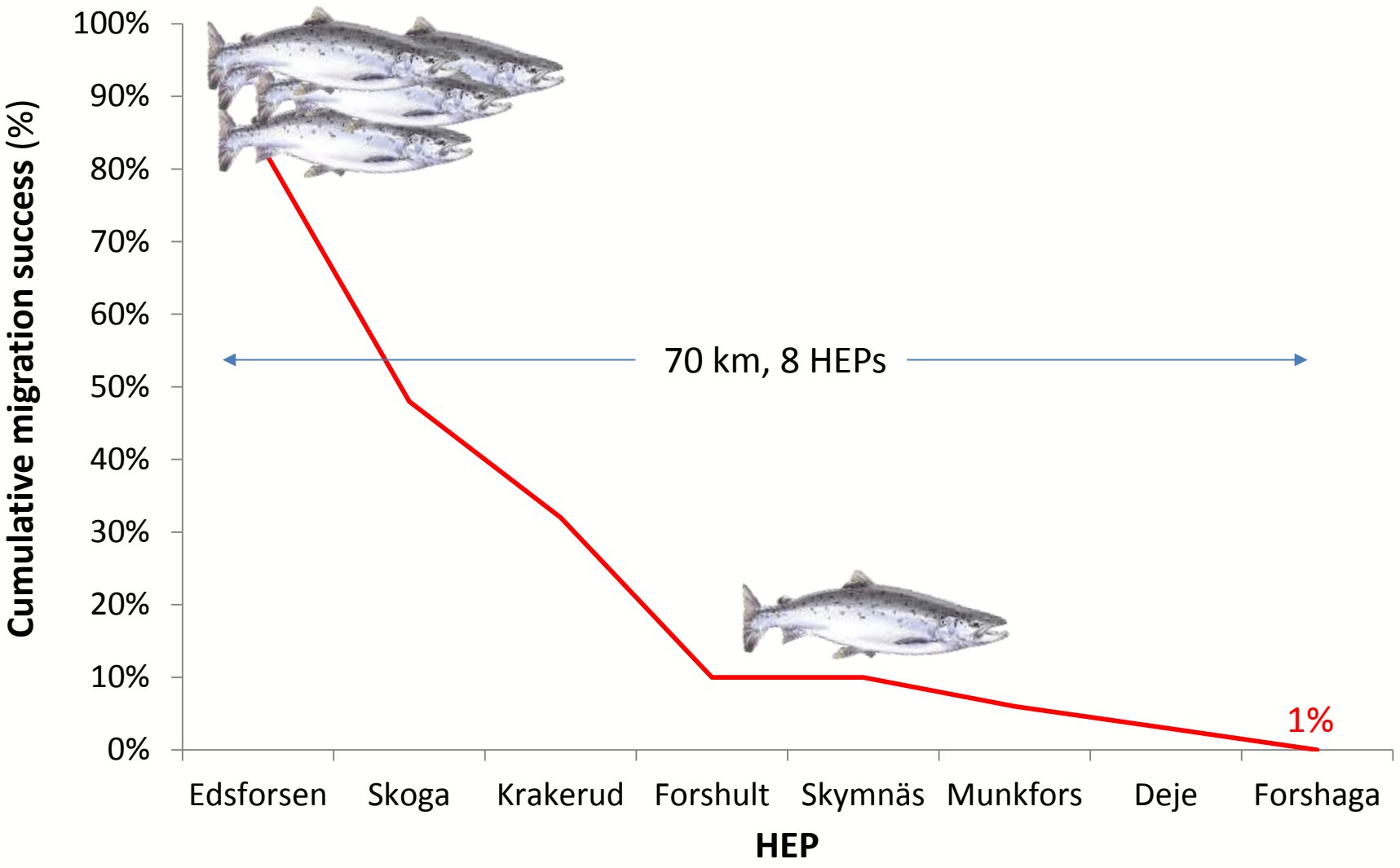
Low Q through spill gates, fishwayQ = 3,2% of totalQ



Downstream migration: **Smolt survival** (acoustic telemetry)



Downstream migration: **Kelt survival** (radio telemetry)

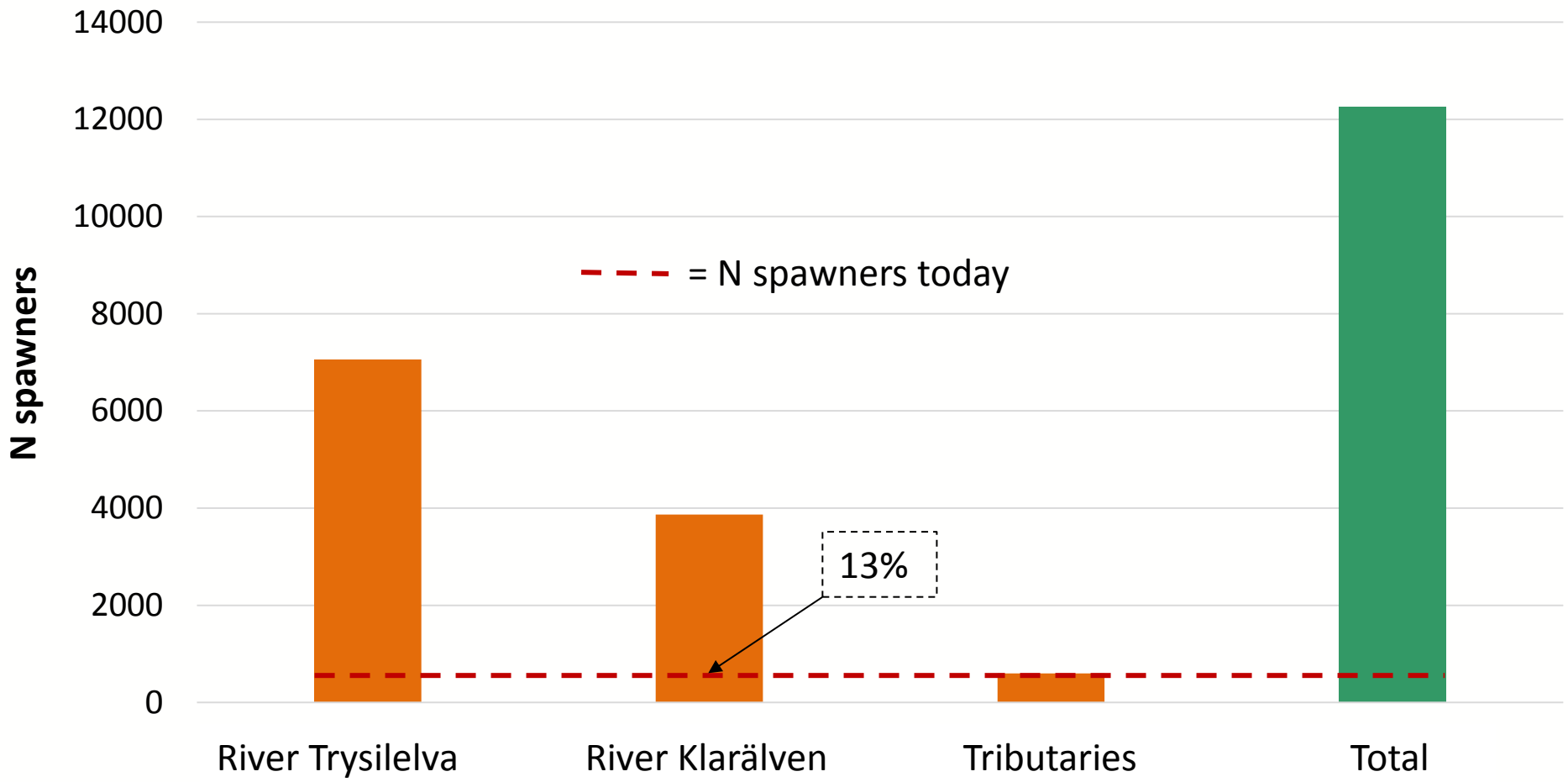


What are the conditions and potential for salmon production in River Klar/Trysilelva?

*Habitat quality * habitat class area * egg/hab. class * egg-smolt-survival * female mean weight * egg/kg* → LBM

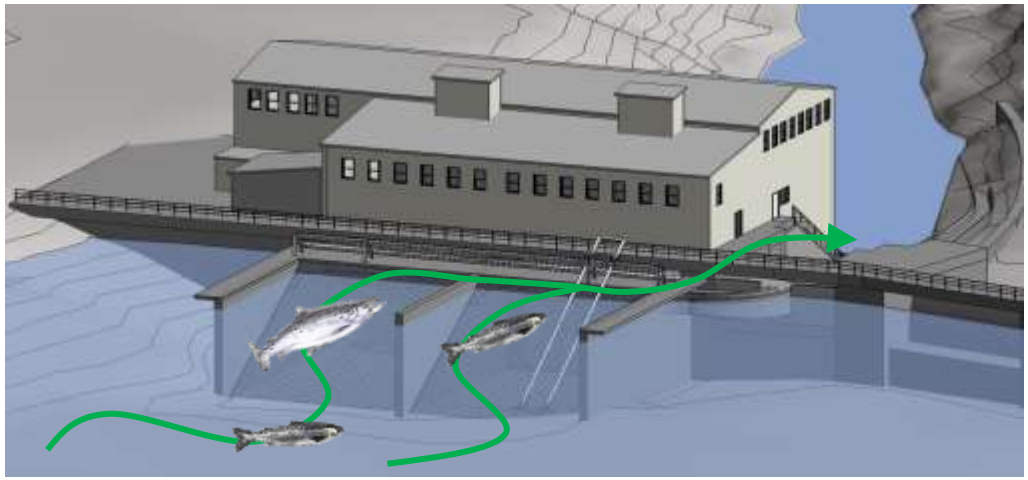
LBM - the river's estimated minimum N spawning females (equal to MSY but in another unit)

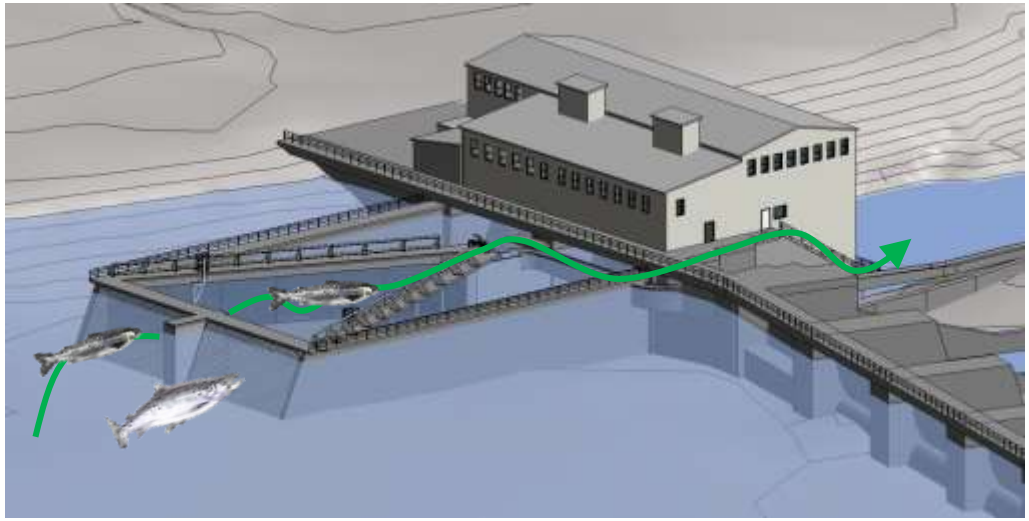
LBM (males + females)



Habitat restoration

Fish passage system at Edsforsens HEP (Fortum, KaU, VFG)





1. Diversion and collection
2. Counting
3. Downstream →
   a) in river
   b) by truck

Fishing tourism and rural development

If the LBM is reached - how much could this generate in terms of money and jobs?

3,5-5,0 million EURO/year*	20-30 full time jobs

***"Ecosystem services" NOT included!**

A brief selection of other investigations

- Fish passage suggestions for each individual HEP (up + down), including pipeline for smolt (17 km)
- Electrical fish barrier at Forshaga HEP
- Production: electrofishing (boat), fyke
- Genetics: wild vs hatchery salmon (basic genetics, parenthood)
- Habitat restoration plans

Final report? → call/e-mail me!

Main conclusions

- The river system still has a high capacity for salmon production
- High economical value
- Bottlenecks:
  - The trap at Forshaga HEP
  - Downstream survival
- Habitat restoration is needed
- Environmental flows are needed
- Expensive

Where do we go from here?

Step model

Short term (0-10 y)

- Maximize production at Swedish side through effective (BAT) measures at the “bottlenecks” Forshaga and Edsforsen HEPs
- Re-introduction of salmon (egg/fry) in River Trysilelva (Norway), combined with fish passage facilities at norwegian HEP
- Habitat restoration and E-flows
- Time and money? → New EU/Interreg-application 2016

Long term (10-30 y)

- Effective fauna passages (BAT) at the remaining HEPs, alternatively, or in combination with removal of some HEPs


A salmon and I’ts ”master” at the Swedish-Norwegian border around 1930
hopefully they will both be back!
Thank you for listening!