

The importance of the salmon river restoration (the river Salaca example)



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What is the “salmon” river?

- River with salmon in all life stages:
- parr,
- smolts
- adult fishes



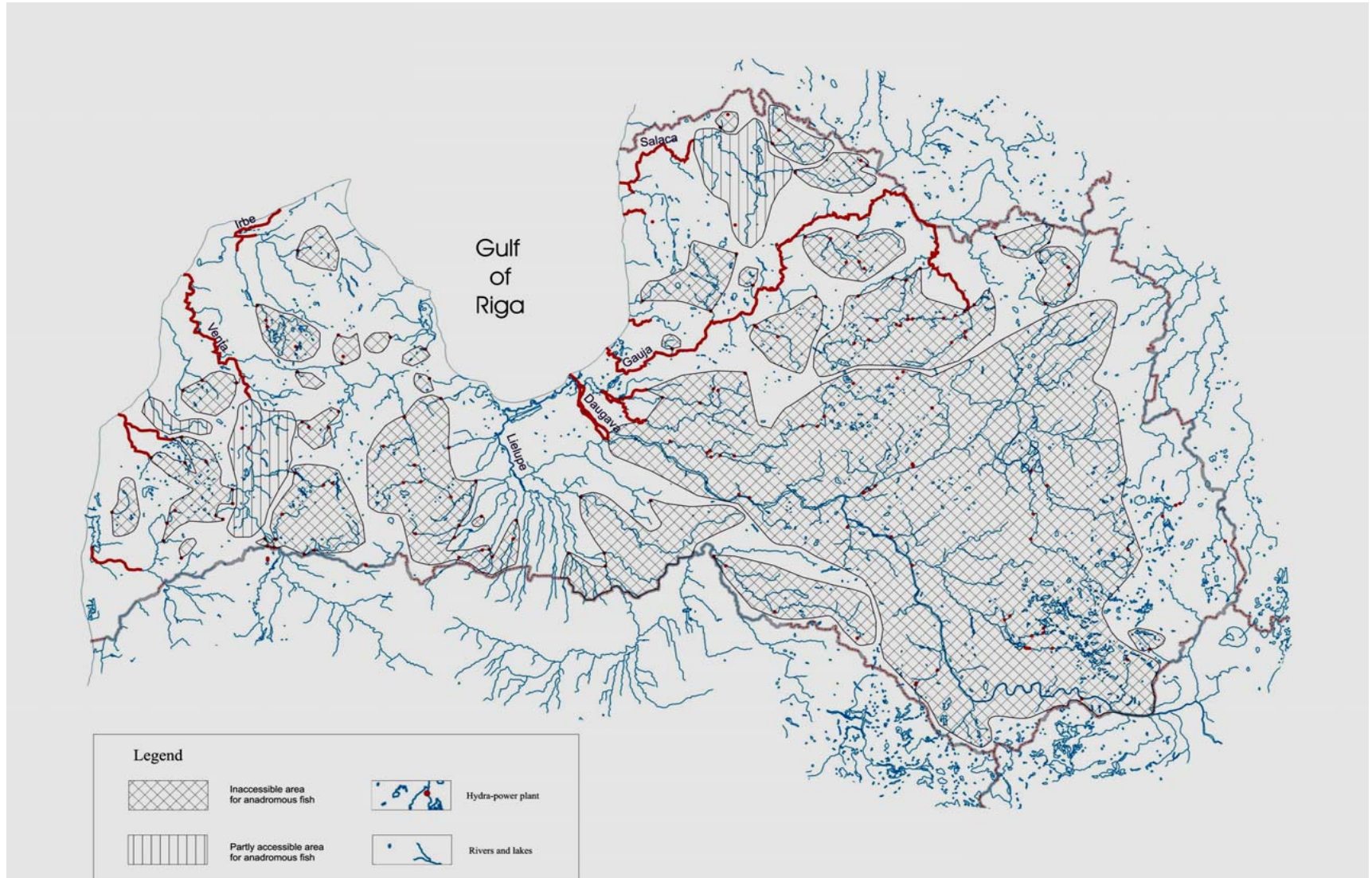
Factors limiting the salmon populations status

- The size and type of the river- Baltic salmon is not common in small rivers;
- Connectivity of the river (absence of natural and artificial obstacles);
- Available habitat;
- Fair water quality;
- Regular and successful reproduction.

The salmon rivers of Latvia

- Largest river (the river Daugava) was blocked by dam in 1974;
- The Baltic salmon is distributed in the 10 of the rivers discharging into the Gulf of Riga and Main Baltic;
- Average size rivers;
- Only partially accessible- waterfalls and dams blocked the spawning migration of salmon;
- The present salmon reproduction area in the rivers of Latvia not exceed 100 ha.

The salmon rivers of Latvia- present situation



The river Salaca



Salaca

- Characterization:
 - The river length- 95 km, 45 km are accessible for salmon
 - Catchment's's area size- 3570 km²
 - Average discharge- 33 m³/s
 - Present distribution of salmon- 41 km of the riverbed and 2 tributaries
 - Present reproduction area- 33 ha

The river Salaca fish communities

- 42 fish and lamprey species were fixed in the river:
 - 30 freshwater species
 - 7 diadromous fish species
 - 3 introduced species (“aliens”)
 - 2 sea species.
- More significant (economically): river lamprey, salmon, sea trout, vimba bream.

Importance of the river Salaca

- The anadromous and fresh water fish production landed per year:
- 60- 65t in commercial fisheries
- 4- 8t in recreational fisheries
- Employment:
- Commercial fisheries- 98 persons;
- Recreational- 2.5- 3 thousand licenses realised in last year.

The river Salaca fisheries economics

- Employed >100 persons
- The value of catch- 100000- 130000 EUR
- Fisheries rights lease- 10000 Ls
- Angling licences sold- 15000 EUR
- Tourism, services, etc.- unknown
- Monitoring, projects- at least 15000 EUR

Salmon habitat in the river Salaca

- Spawning habitat:
 - tails of pools with pebble/cobble bottom substrate. Depth $<1.5\text{m}$, velocity- $0.1- 0.5\text{ m/s}$;
- Parr habitat:
 - riffle areas with gravel/pebble/cobble/boulders substrate. Depth $<1\text{m}$, velocity $0.1- 1.0\text{ m/s}$

Typical salmon biotopes, main threats



Overgrowing;

Decreasing of
flow, siltation

In result- area
acceptable for
salmon juveniles
decreased;

Salmon production
in the river-
decreased

Productivity of the river Salaca, benefits of rapids restoration

- What is standing stock of fish in the river Salaca?

Typical salmon habitat holds 170 kg/ha fish, in the places of juvenile salmon, overfalls- about 170 kg/ha, 46kg of them are salmon parr. The amount of fishes targeting by fisheries or angling- 100kg/ha.

In numbers- 31 thousand fishes/ha

The benefits from restoration of 1 ha of the river Salaca rapids- 0.1- 0.2 t of juvenile fish, which will produce up to 2 t adult fish for fisheries and angling;

Restoration of salmon habitat improves the conditions for other fish species- sea trout, river lamprey, vimba etc.

The problem of Staicele pulp-mill dam

- No clear historical data (fisheries or angling statistics)- only well known that after the damming of the river (first decade of the 20th century) diadromous fishes populations disappeared in the upper part of the river
- Possible effect of the re-opening of the river:
- 4.2 ha potential salmon habitat in the upper part of the river Salaca;
- Accessibility of the tributaries, lake Burtnieks, rivers discharging in the lake.

The history of problem

- In the end of 19th century dam was built for technological and energetic needs;
- In 60- 70s special kind of paper for electro techniques produced- as result pollution effects of the river increased
- In 1980 paper production was stopped and dam demolished;
- In 90s the group of private persons try to realise the project on HPS establishing;
- At present- idea of full re-opening of the river by the demolition of dam foundation

Additional problems

- The river was blocked the dekades of years;
- Demolition of the dam should be supplemented by restocking of salmon in the upper part of the river Salaca;
- In 2006.g. in the river Salaca upper part tributaries sea trout fry and parr releasing is planned

Possible effect of Staicele dam demolition

- After dam demolition few hectares of rapids in the river Salaca and their tributaries will reopen. The potential fish production from these areas are estimated per year:

Salmon- 4.2 t

Sea trout- 1.2 t

River lamprey- 5 t

Vimba bream- 3 t

In total fish about 30- 35 RUR per year