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THE ECOSYSTEM SERVICES OF URBAN RIVERS
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Economic assessment of recreational ecosystem services affected by the rehabilitation project of a Finnish river

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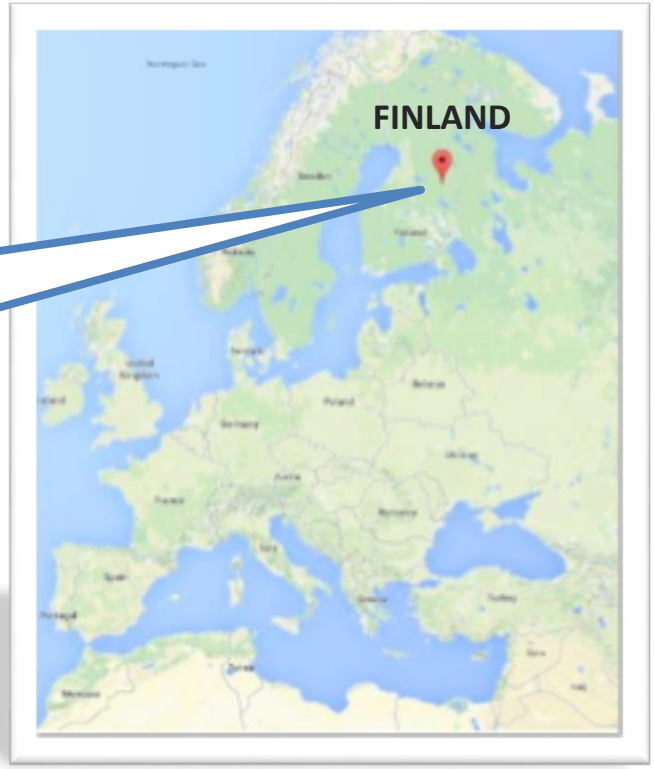
AIM OF THE PROJECT

Performing an economic assessment of the **marginal value** of ecosystem services affected by the restoration project of the Finnish river Pajakkajoki.

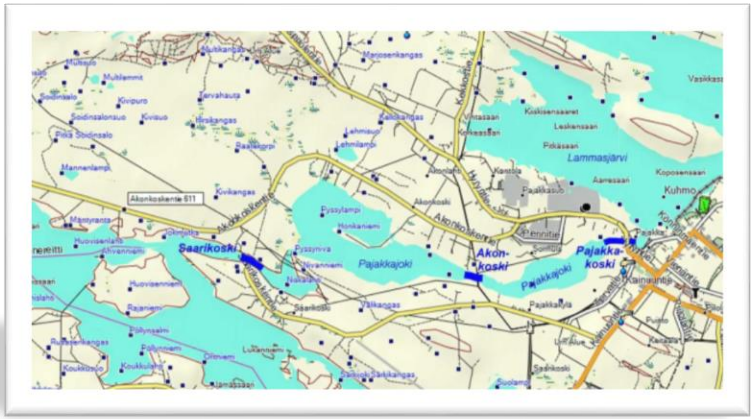


PROJECT AREA

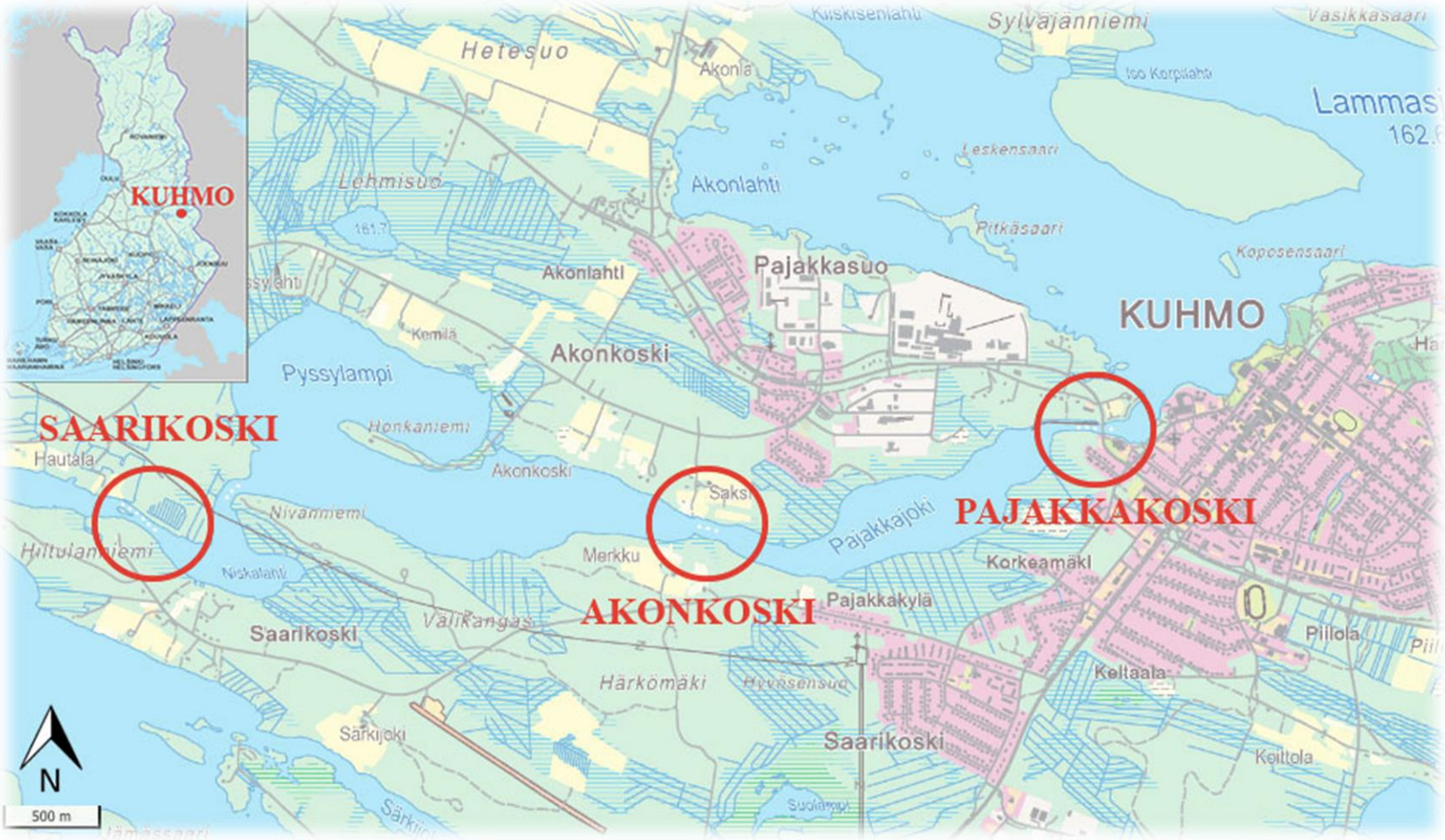
Pajakkajoki river is located in the city of Kuhmo, it is 12 km long and has three rapids.

Historically, it has been shaped to improve conditions for water transportation, tar industry and wood industry.

In the region it is a known fishing site, mainly for stocking and indigenous salmon-line fish species.



PROJECT AREA



REHABILITATION WORKS

- ✓ New and easier access points (also for disabled people);
- ✓ More walking paths, resting facilities and scenic areas;
- ✓ More spawning area for fish breeding and reproduction;
- ✓ New openings for more natural water flow and fish movement;
- ✓ New and more conservative fishing rules.

REHABILITATION WORKS

STUDY APPROACH

1. Mapping ESS provided by the investigated area

2. Identifying the ESS affected by the rehabilitation project

3. Economic estimation of the marginal change in ESS

STUDY APPROACH

Ecosystem services / Rehabilitation measures	FISH HABITAT				WATER REGULATION		CULTURAL		
	Reproductive habitat (spawning areas)	Nursery habitat (fry areas)	Shelter areas for adult fishes	Wild fish stocks	Rehabilitate natural flow regime	Water quality	Outdoor activities	Recreational fishing	Aestetic,educational and spiritual value
Water regime rehabilitation									
New embankments and rock blocs	Replacement Cost / Avoided Cost				Replacement Cost				
Placing of spawning gravel									
Boat channel bottom									
Digging (higher depth)									
No measures (current depth)									
Old stone structures for boat transfering									
Restoration (cultural value)									
Demolition									
New fishing rules									
Higher minimum sizes							Contingent Valuation Economic income		
Lower catch quota									
Separate license									
Recreational rehabilitation measures									
Cleaning and tiding measures							Contingent Valuation and Economic income		
New accessible walking paths									
New acess points									

A lot of data required for both states: before and after rehabilitation…

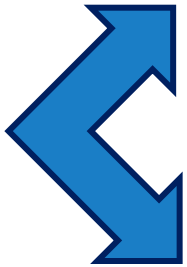
…NOT AVAILABLE!

QUESTIONNAIRE

Respondents are asked to state their **WILLINGNESS TO PAY** for the preservation-restoration of a given service under hypothetical scenarios.

NON-USE VALUE

RECREATIONAL ESS

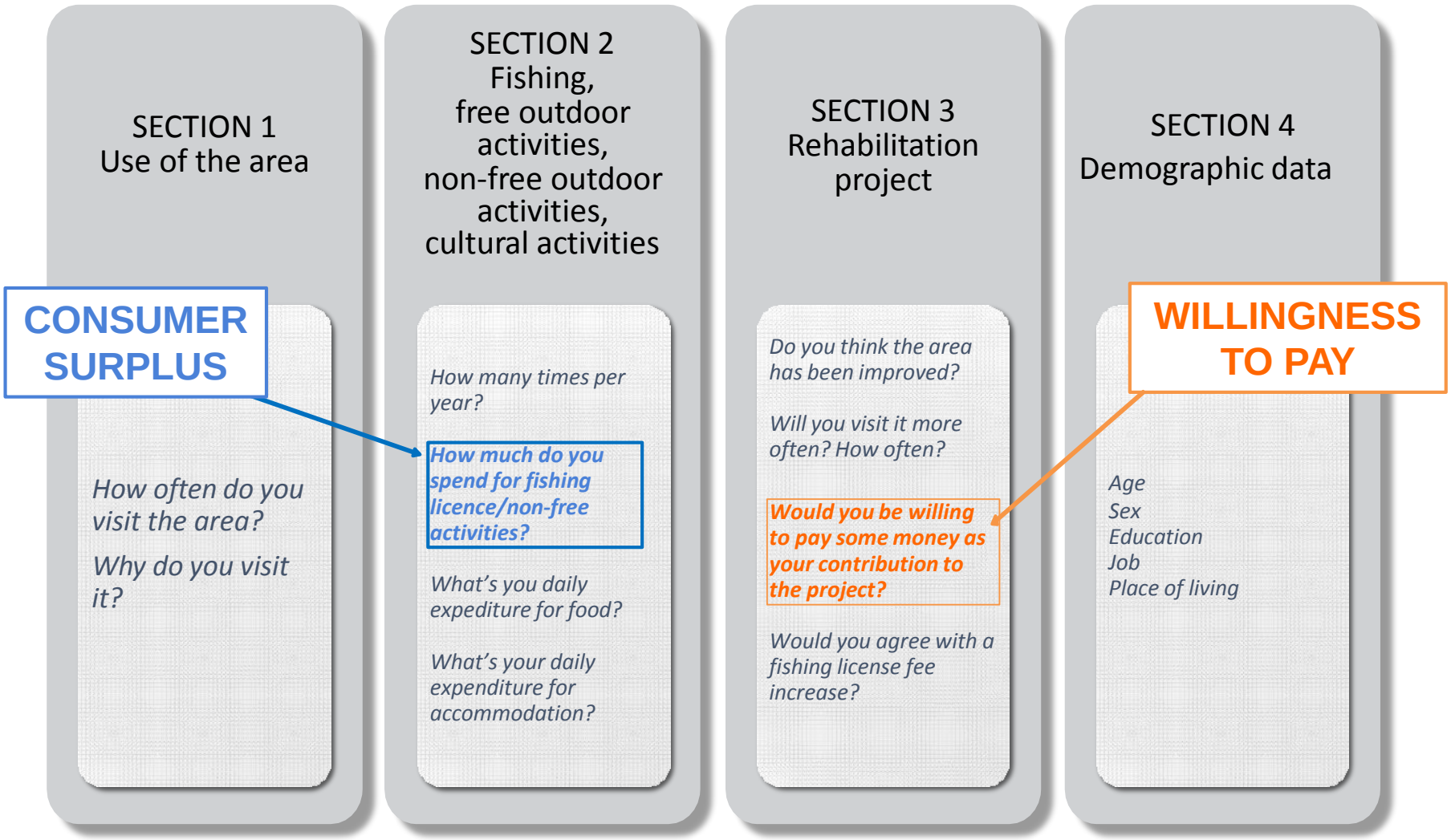


Ad hoc questionnaire survey combining stated and revealed preferences methods

USE VALUE

Estimation of the **CONSUMER SURPLUS**, specifically the daily and annual visitors expenditures for recreational activities in the area (food, fishing licenses, tackle rental, accommodation, fuel, etc.)

QUESTIONNAIRE



RESULTS

- ✓ Almost 900 persons were informed about the survey;
- ✓ Replies were 119 (**response rate of 13%**);
- ✓ Collected data provided:
  - ❑ **Qualitative information**: on the rehabilitation project and people perception about it; on demographic data of population interested in being involved (sex, age, etc.); on the percentage of people (85%) that stated their willingness to make more visits to the river area because of the improved conditions of the site.
  - ❑ **Quantitative information**: daily expenditures for recreational activities and voluntary contribution.

RESULTS

	Annual expenditure €/person/year	Additional recreational days	Additional annual expenditures €/person/year	WTP €/person/year
Resident visitors (54)	81.0	5,5	12.9	10
Non resident visitors (65)	130.0	1	39.0	10
Total (119)	**126.0**	**2**	**30.0**	**10**

Note: Median values.

RESULTS

	Change in marginal value of recreational ESS €/person/year	Increase in total annual value €
Resident visitors (54)	24.6	9028.2
Non resident visitors (65)	52.4	6183.2
Total (119)	**40.0**	**19400.0**

Note: Median values.

CONCLUSIONS

- ✓ An economic estimation of **marginal change** in ecosystem services due to the rehabilitation project of a Finnish river was performed;
- ✓ Only **recreational ecosystem** services was assessed, resulting anyway in a more conservative approach;
- ✓ Data collected through ad hoc questionnaire allowed to estimate that environmental benefits of the river rehabilitation compensate for its costs in a time of about **3 –10 years**;
- ✓ Future developments should be addressing the ESS not considered here providing a more accurate assessment of benefits resulting from the rehabilitation project.

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