# Preliminary monitoring results of biological quality elements in LIFE GoodWater IP project demo streams

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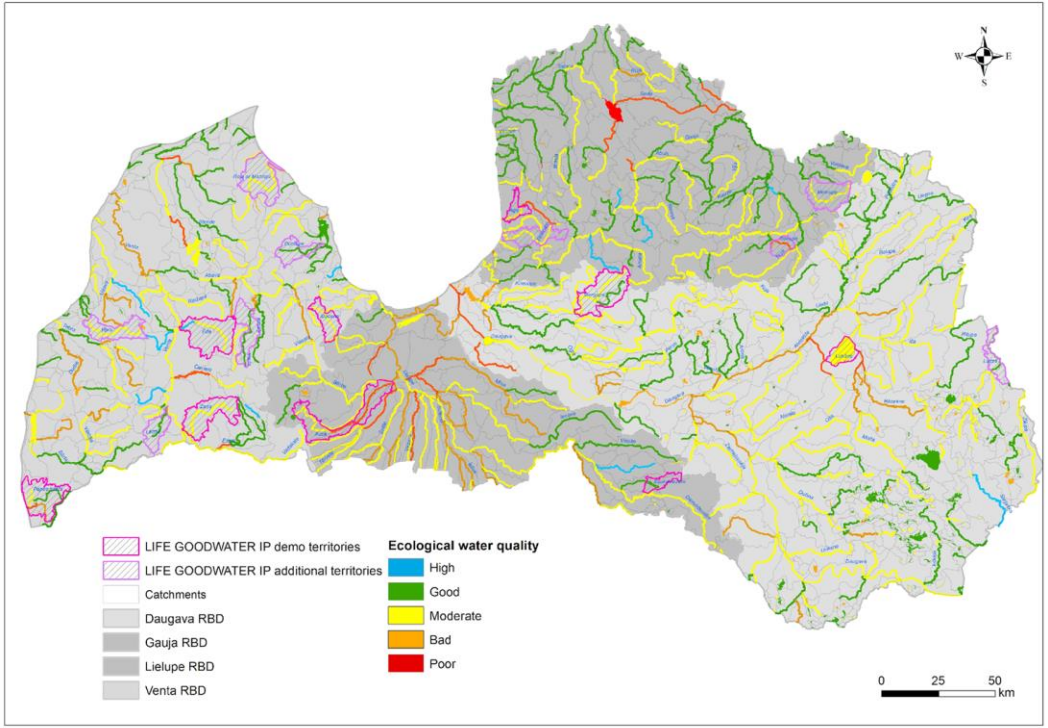
EU LIFE Programme integrated project
"Implementation of River Basin Management Plans of Latvia towards good surface water status"

# Biological monitoring

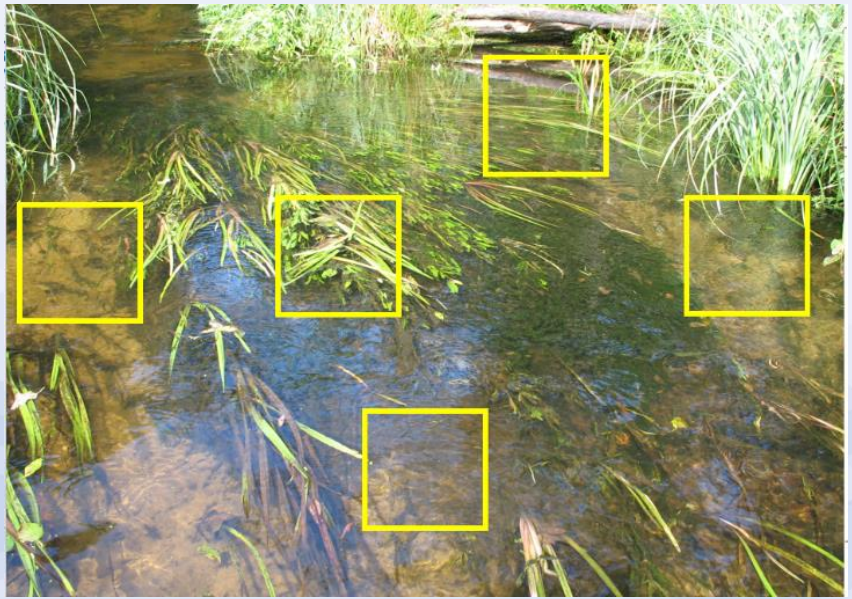
Monitoring carried out in two rivers – Aģe and Slocene, project demo territories carried out in 2020 and 2025.

Biological elements – benthic macroinvertebrates and macrophytes.



# Methodology - macroinvertebrates

Sampling - in spring (April, May), 5 replicates in proportion to present microhabitats.



# Methodology - macrophytes

| Points | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| % | <0,1 | 0,1-1 | 1-2,5 | 2,5-5 | 5-10 | 10-25 | 25-50 | 50-75 | >75 |

100 m stretch

**Biotopu raksturojošās sugas (aizpilda 100m garam posmam (transektei)).** Vērtē projektīvo segumu apsekotajā posmā no spoguļvirsmas 9 ballu skalā, kur "1" - viens vai daži augu eks.; "2" – (0,1% - 1%); "3" - (>1% - 2,5%); "4" - (2,6% - 5%); "5" - (>5% - 10%); "6" - (>10% - 25%); "7" - (>25% - 50%); "8" – (>50% - 75%); "9" - >75%.

Upes **hidroloģiskais** režīms (% no posma garuma) Sākuma koordināta X _____ Beigu koordināta X _____

Straujtece: straumes ātrums > 0,2 m/s _____ % Sākuma koordināta Y _____ Beigu koordināta Y _____

Lēntece: straumes ātrums < 0,2 m/s _____ %

**Aizaugums ar makrofītiem** (kopējais projektīvais segums) _____ %, t.sk.

**Aizaugums ar makrofītiem bez indikatorsugām, kas norāda uz labu ekoloģisko stāvokli** (bez ūdenszālēm,

Virsūdens augi (H), % | Peldlapu augi (N), % | Iegrimušie augi (E) %

| | | | |
|---|---|---|---|
| ***Aļģes*** | *Batrachospermum spp.* ____ | *Cladophora spp.* ____ |
| | *Hildenbrandia rivularis* ____ | *Chara spp.* ____ |
| | *Chlorophyta* ____ | Cits_____ ____ |
| ***Sūnas*** | *Fontinalis antipyretica* ____ | *Fissidens arnoldii* ____ |
| *Leptodictyum riparium* ____ | *Fontinalis hypnoides* ____ | *Platyhypnidium riparioides* ____ |

**Vaskulārie augi** (attiecīgi atzīmē auga formu ar H - helofīts, N - ranfeids, E - elodeids un projektīvo segumu), retās un aizsargājamās sugas izceltas treknrakstā, ar peldīcu iezīmētās sugas sastopamas lēni tekošās ūdenstecēs (straumes ātrums < 0,20 m/sek), pasvītrotas straujām, ritrālā upēm raksturīgās augu sugas.

| | H | N | E | | H | N | E | | H | N | E |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Acorus calamus* | | | | *Hydrocharis morsus - ranae* | | | | *Potamogeton natans* | | | |
| *Alisma plantago - aquatica* | | | | *Iris pseudacorus* | | | | *Potamogeton obtusifolius* | | | |
| *Batrachium** | | | | ***Lemna gibba*** | | | | *Potamogeton pectinatus* | | | |
| *Batrachium circinatum* | | | | *Lemna minor* | | | | *Potamogeton perfoliatus* | | | |
| *Batrachium trichophyllum* | | | | *Lemna trisulca* | | | | *Potamogeton praelongus* | | | |
| *Berula erecta* | | | | *Lysimachia vulgaris* | | | | *Potamogeton pusillus* | | | |
| *Butomus umbellatus* | | | | *Naumburgia thyrsiflora* | | | | *Ranunculus lingua* | | | |

# Methodology – ecological quality assessment

Macroinvertebrate indices:

Multimetric index LMI (Latvian Macroinvertebrate Index) is a multimetric index which consists of:

- T - total number of taxa
- Danish Stream Fauna index (Skriver et al. 2001)
- Number of EPT taxa (Lenat 1988)
- ASPT (Average Score per taxon) – Armitage et al. 1983

Macrophyte index:

Latvian National Macrophyte Index for Rivers (Latvian MIR)

# Results – River Slocene, Sloklejas


Species diversity is relatively low.

Reasons – substrate and shading.

| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | Poor | Moderate |
| Macrophytes | High | Good |

# River Slocene, Priežķellas

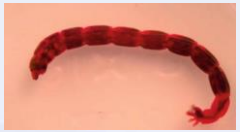

Short unmodified river stretch.
Substrate sandy, shaded by trees.
The only stretch of the river where empty shells of protected mussel *Unio crassus* are found.

| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | No data | Moderate |
| Macrophytes | No data | Good |

# River Slocene, upstream wetland


Straightened stretch of stream, cleaned in 2023.

Species composition indicates high nutrient concentrations in water.
Dominating substrate – gravel and mud.



| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | No data | Moderate |
| Macrophytes | No data | Moderate |

# Results – River Aģe, Mandegas


| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | Good | High |
| Macrophytes | High | Good |

*Ceratophyllum demersum, Lemna* sp. – indicate high nutrient concentration in water.

High number of ecologically sensitive macroinvertebrate taxa .

# Created wetland on River Aģe

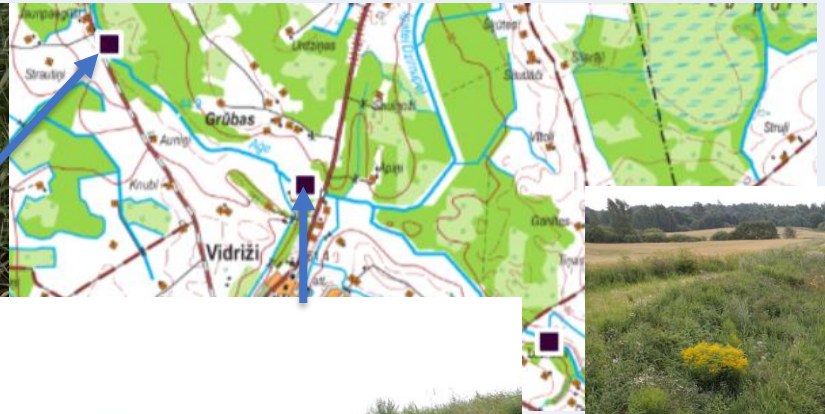
# River Aģe, downstream of the wetland


The possible reason of decrease in ecological quality is excavation and wetland construction.

Relatively high macrophyte species diversity.

| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | Good | Moderate |
| Macrophytes | Good | Good |

# River Aģe – downstream and upstream Vidriži




# Results – downstream and upstream Vidriži

Upstream Vidriži

| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | No data | Data in progress |
| Macrophytes | No data | Moderate |

Straightened stretch of stream, cleaned in 2014.

Higher ecological quality in the stretch where water is deeper and slow faster.

Downstream Vidriži (100 m)

| | 2020 | 2025 |
|---|---|---|
| Macroinvertebrates | No data | Data in progress |
| Macrophytes | No data | Good |

Downstream Vidriži (2 km)

| 2020 | 2025 |
|---|---|
| No data | Data in progress |
| No data | High |

# Rare and protected species found in River Aģe

1. Thick-shelled mussel *Unio crassus* (EU Habitats directive, Annex II and IV)

2. Golden-ringed ragonfly *Cordulegaster boltonii* (LV Cabinet of Ministers regulation No. 396 14.11.2000, and No.940 18.12.2001.)

3. River limpet *Ancylus fluviatilis* (LV Cabinet of Ministers regulation No. 396 14.11.2000)


# Summary

- Pollution (agriculture, wastewater)
- River modification
- Beaver activity
- Fallen trees

River Aģe upstream Vidriži

# Thank you!

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