Migratory fishes in the SK-HU part of the Danube within LIFE Living Rivers project: sterlet as an umbrella species

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Living Rivers

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Project full name

Implementation of the river basin management plan in selected river sub-basins in Slovakia

Project schema	**LIFE Strategic Nature and Integrated Projects (SNaP/SIP)**
Project acronyme	**LIFE21-IPE-SK-LIFE Living Rivers**
Project code	**101 069 837**
Project duration	**1.1.2023 - 31. 12. 2032**
Project budget	**27 799 420.33 €**
European Commision contribution / Co-financing (own sources)	**16 677 073.39 € (60%) / 11 119 760.94 € (40%)**

Project partners

Danube: FISH(STURGEON)-related project activities

Sterlet (*Acipenser ruthenus*): flagship/umbrella fish of the Danube + upper and middle parts of the Danube: **only sturgeon species - threatened** since 2019**, decreasing population trend**

WP2: Integrated management planning – from basin scale to river reach (coordinator: VÚVH)

I) Making passable of current migration barriers: 1 task

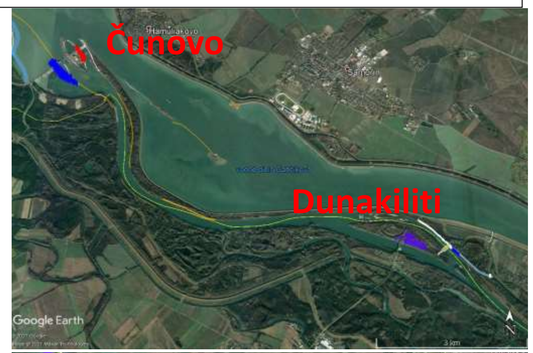
• TASK T.2.3. Re-establishment of migration routes for STURGEON species on the Danube river and re-connection of its floodplain habitats (leader: VÚVH)

- objective: **to propose measures focused on making again passable the Danube for fish (including STURGEONS) and restoring the functionality of the inland delta** (and subsequently verifying the functionality of these measures)

- goal: **the Old Danube and the riverside branches system must once again function as a natural biocorridor - model group: STURGEONS** (+ other rheophilic species)

- **tasks:** a) **construction of a fish pass through the Čunovo dam**, b) **construction of a fish ladder and/or biocorridor through Gabčíkovo water construction**, c) **relocation/of the Dunakiliti dam (shift more downstream)**, d) **partial passage of the riverside branch system,** e) **revitalization measures to improve the lateral connectivity, bank morphology**

- current status: activity in progress, planning



Danube: FISH(STURGEON)-related project activities

WP4: Nature and biodiversity friendly fishing management and active measures to support prospects of target umbrella fish species (coordinator: USB)

II) Support of natural populations of the sterlet: 2 tasks

• Task T.4.2. In situ strengthening of natural populations of Danubian STURGEONS using eggs incubation in the wild

- in the **years 2024-2029**, **annual stocking and incubation of fertilized sterlet eggs** (10 thousand eggs per year) **in the fish incubators at suitable natural localities**
- **current status**: Activity started in spring (april) 2024, broodstock: genetical pure Danubian lineage, 2 localities (Old Danube, Outflow channel of Gabčíkovo HPP), incubators installed in the river stream, 5 types of incubation substrates, **incubation more than 20,000 sterlet eggs**

→ develop **sturgeon- and user(fisherman)-friendly method**

Sterlet larva ready to drift.

Danube: FISH(STURGEON)-related project activities

WP4: Nature and biodiversity friendly fishing management and active measures to support prospects of target umbrella fish species (coordinator: USB)

II) Support of natural populations of the sterlet: 2 tasks

• Task T.4.3. Juveniles re-stocking as an in situ conservation measure for reinforcement of the STURGEON's populations in the Slovak part of the Danube

- in the **years 2023-2028**, **annual stocking of sterlet juveniles** (10 thousand individuals per year) **in suitable natural localities**

- all stocked fish marked/stained by alizarin red S for verification of stocking effectiveness (in advance, all caught sterlet will be read by laser reader)

- current status: Activity has already started. 20 thousand sterlet juveniles stained and stocked in 2023 at three localities (Čunovo, Sáp, Veľkolélský).

Stained juvenile ready to be released

Danube: FISH(STURGEON)-related project activities

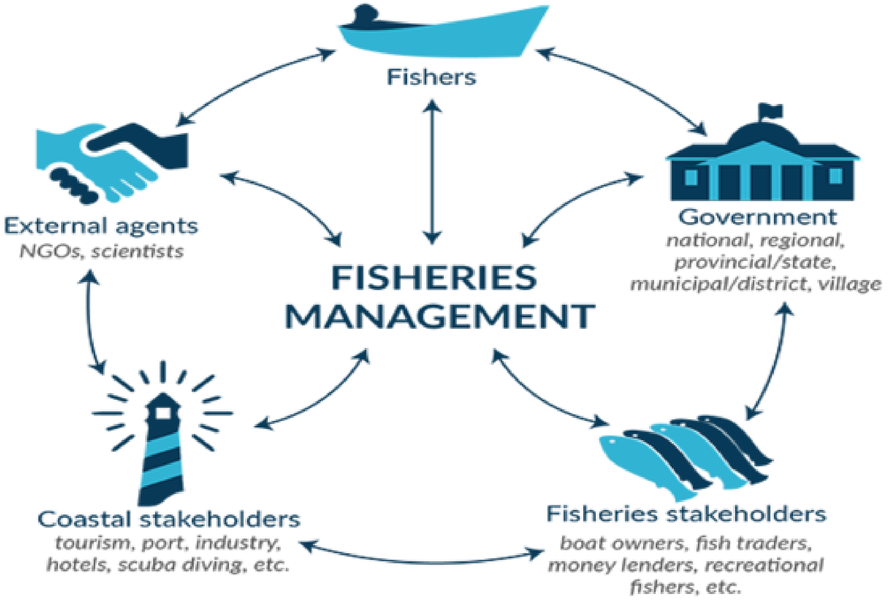
WP4: Nature and biodiversity friendly fishing management and active measures to support prospects of target umbrella fish species (coordinator: USB)

III) Sustainable fisheries management: 1 task

• Task T.4.4. Nature and biodiversity friendly fishing management

- objectives:
- **to create and set rules and principles for sustainable, close to nature, gentle fishing and fishery management and preparation of relevant guidelines** for the Danube basin (model group: **STURGEONS**)
- **to establish a professional working group for the introduction and adaptation** of the principles of sustainable fisheries management into practice
- to make an **agreement with stakeholders** (water managers, operators of hydropower plants, fishermen and other water users) **for compliance with established rules and proposed measures**

- current status: Activity already started, expert work group should be established by the end of 2028



Danube: FISH(STURGEON)-related project activities

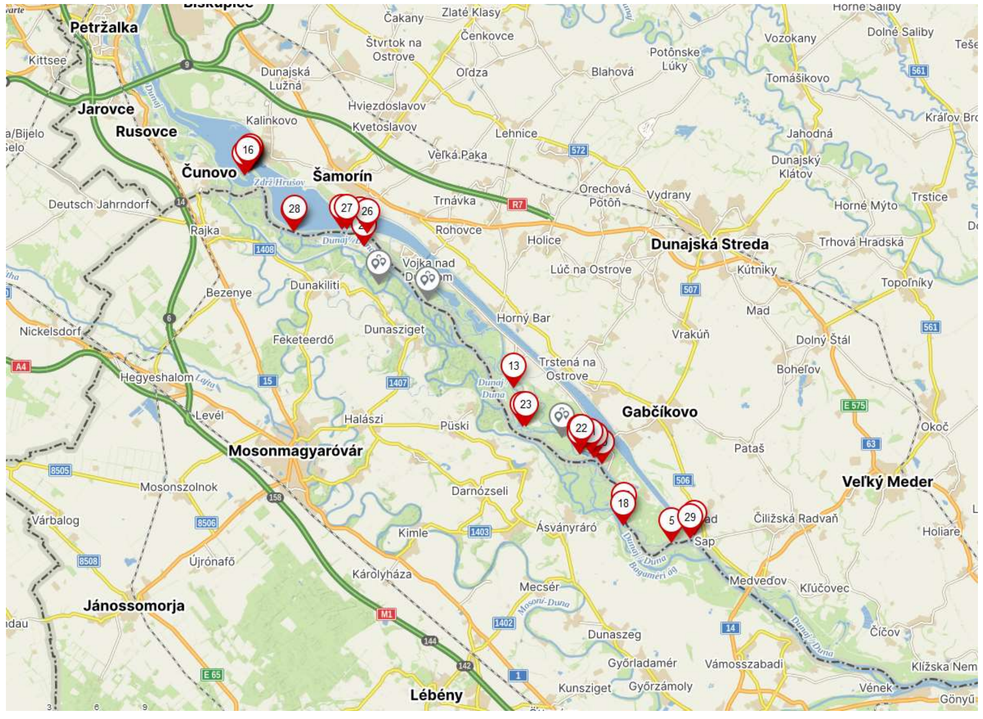
WP6: Monitoring of the impact of the project actions (coordinator: VUVH)

IV) Fish monitoring: 3 tasks

• Task T.6.3 Monitoring of the ichthyocoenoses in the target river catchments

- In 2024-2029, **regular monitoring of fish populations in the Danube basin**
- **2 phases:** Before and after application of specific measures (planned within LIFE project as well as within complementary actions)
- **Target area: 2 areas**: 1) **the „Old“ Danube** (from Čunovo dam to the confluence with the Outflow channel of the Gabčíkovo water construction, rkm 1809-1853); 2) **River side branches system** (part between Bódiky to the confluence with the Old Danube near Gabčíkovo port, rkm 1820-1840)
- **Combination of various ichthyological methods**: electrofishing, hauling, multimesh gill nets, trammel nets (drifting and stationary ones)

- current status: Activity already started in August 2023. In total, 41 fish species confirmed. **Caught only 1 individual of sterlet** (Old Danube, below the Čunovo).
2024: The activity will continue with a frequency twice a year.



Danube: FISH(STURGEON)-related project activities

WP6: Monitoring of the impact of the project actions (coordinator: VUVH)

IV) Fish monitoring: 3 tasks

● Task T.6.4 Telemetric surveys of passability of the Danube for fish in the Slovak Republic

- **Aim:** to determine the **current migration passability of selected parts of the Danube (including water constructions Čunovo, Gabčíkovo and Dunakiliti)** in Slovakia for rheophilic fish species (including **STURGEONS**) + to verify the **migration passability after realization of mitigation measures** (removal and making the barriers passable during the project)
- **2 phases survey:** Before (2024-2026) and after application (2028-2030) of specific measures (planned within LIFE project as well as within complementary actions)
- **Monitored area: 2 project areas (river systems) + 2 control points: In total, 54 + 43 = 97 (river) kilometers**

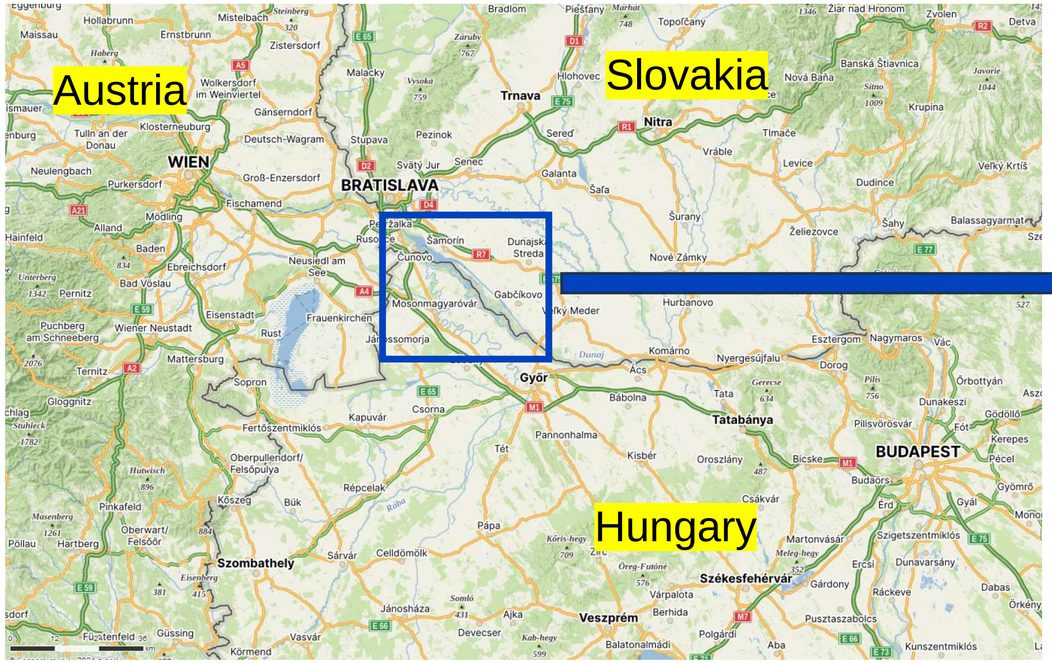
1) **The „Old“ Danube** (from Čunovo dam to the confluence with the Outflow channel of the Gabčíkovo water construction) **including terminal part of the River side branches system** (close to confluence with the Old Danube near Gabčíkovo port)
2) **The „new part“ of the Danube** (**Inflow and Outflow channels of the Gabčíkovo hydro power plant**, rkm 0.0-37.6)
3) **1st control point (above project areas): Lužný bridge (motorway bridge over the Danube in Bratislava; rkm 1860.3)**
4) **2nd control point (below project areas): Medveďov bridge (road bridge over the Danube in Medveďov; rkm 1806.3)**

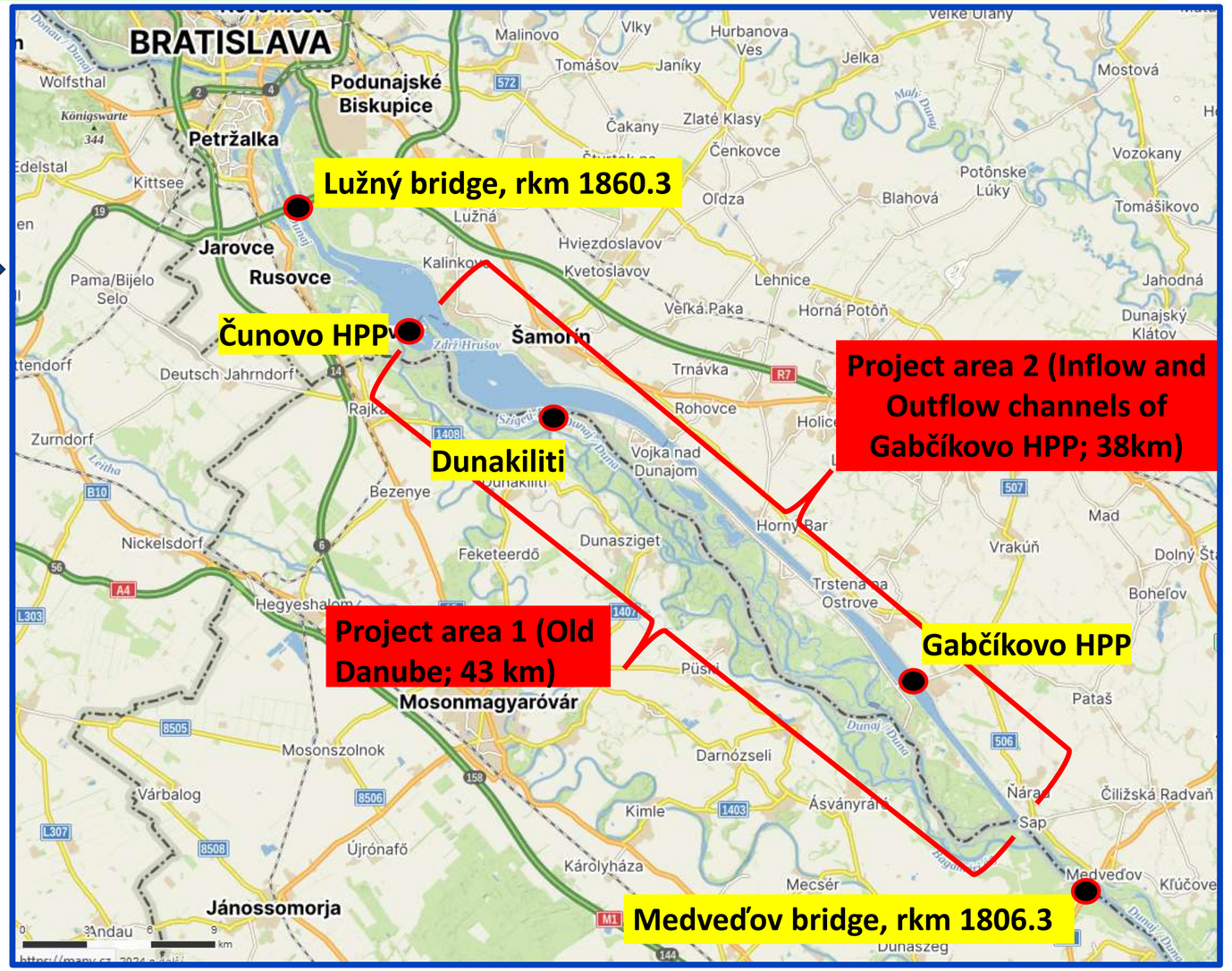
Danube: FISH(STURGEON)-related project activities

WP6: Monitoring of the impact of the project actions (coordinator: VUVH)

IV) Fish monitoring: 3 tasks

• Task T.6.4 Telemetric surveys of passability of the Danube for fish in the Slovak Republic: MAP OF AN AREA OF THE TELEMETRIC SURVEY





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IV) Fish monitoring: 3 tasks

• Task T.6.4 Telemetric surveys of passability of the Danube for fish in the Slovak Republic

- **Methods: Acoustic telemetry** (LOTEK company, Canada)

  - application of **active transmitters** into the fish belly (combined fish tags, MM series): **monitoring of fish position, temperature and water depth**

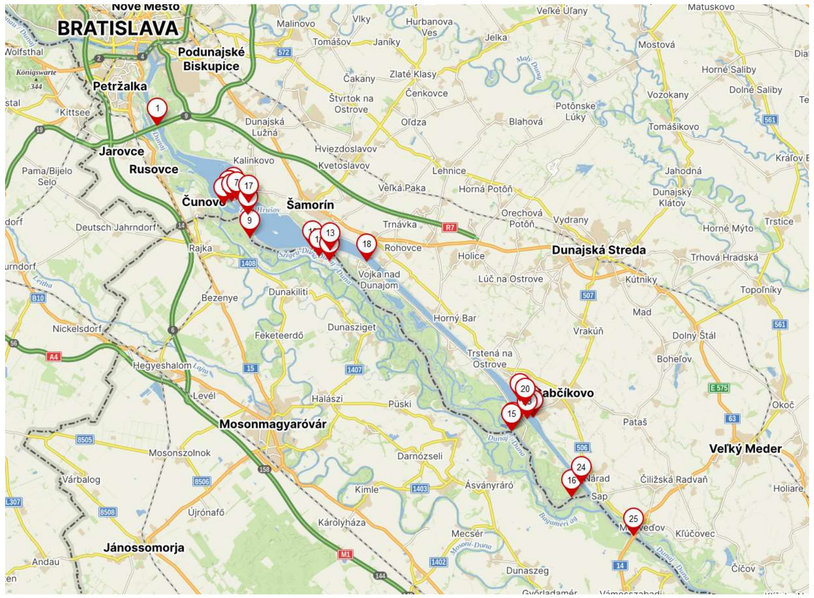
  - **2 telemetric approaches:**

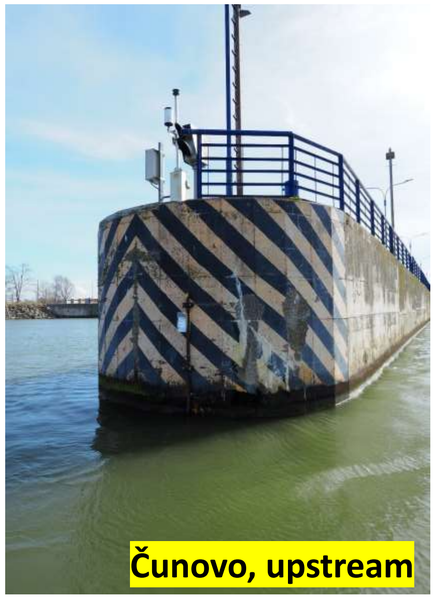
A) Position telemetry: continual data acquisition, **25 locations for gates** (constructed using WHS 3250L dataloggers) - all water constructions upstream/downstream + river sections between

B) Active telemetry from the boat: three times per season, use of directional mobile acoustic tracker (AcouTrack) system with hydrophones and GPS navigation

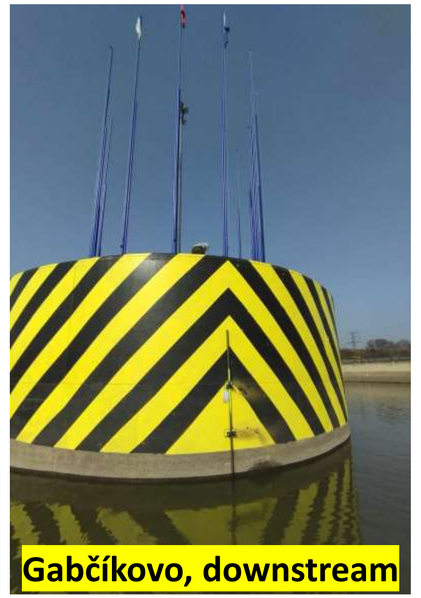

Lužný bridge


Old Danube, free-flowing section




Čunovo, upstream


Dunakiliti, Hu, upstream


Gabčíkovo, downstream


Medveďov bridge

Danube: FISH(STURGEON)-related project activities

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IV) Fish monitoring: 3 tasks

• Task T.6.4 Telemetric surveys of passability of the Danube for fish in the Slovak Republic

- **3 model (rheophilic) fish species:**

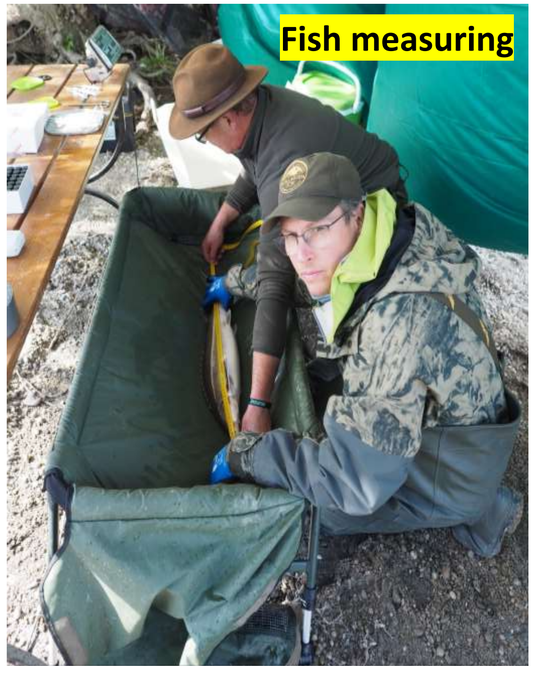
a) **Sterlet (*Acipenser ruthenus*) – planned 100 individuals (individual weight over 2 kg), origin: Outflow channel (Gabčíkovo HPP); tagging: PIT tag + MM-M-16-50-TP + „pig“ plastic tag; application: April 2024, 61 individuals).**

Applied „pig“ tag

Fish tag MM


Application of internal MM tag


Caught fish


Fish measuring


Checking of presence of PIT tag


Application of PIT tag


Fish ready to go home

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IV) Fish monitoring: 3 tasks

• Task T.6.4 Telemetric surveys of passability of the Danube for fish in the Slovak Republic

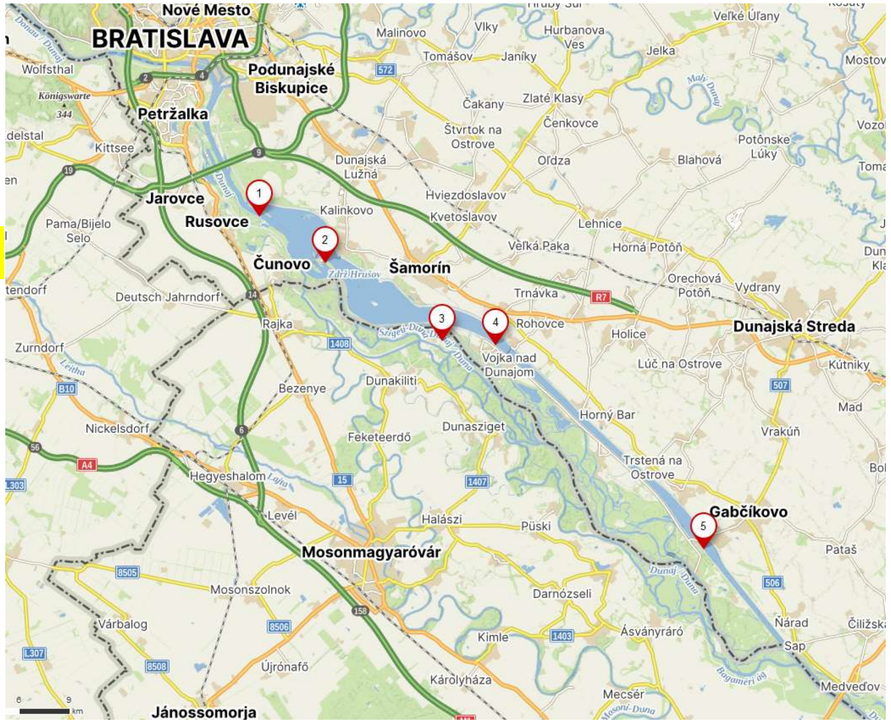
- **3 model (rheophilic) fish species:**

a) **Sterlet (*Acipenser ruthenus*): tagged fish released at 5 localities (12 individuls per group) respecting presence of water constructions (above and below each construction).**

b) **Barbel (*Barbus barbus*)**

c) **Asp (*Leuciscus* (*Aspius*) *aspius*)**

– planned 50 individuals per species (individual weight over 1 kg); tagging: PIT tag + MM-M-11-45-TP; application: September/October 2024



Danube: FISH(STURGEON)-related project activities

WP6: Monitoring of the impact of the project actions (coordinator: VUVH)

IV) Fish monitoring: 3 tasks

• Task T.6.5 Verification of STURGEON natural reproduction in the Slovak part of the Danube using ichthyoplankton collection nets

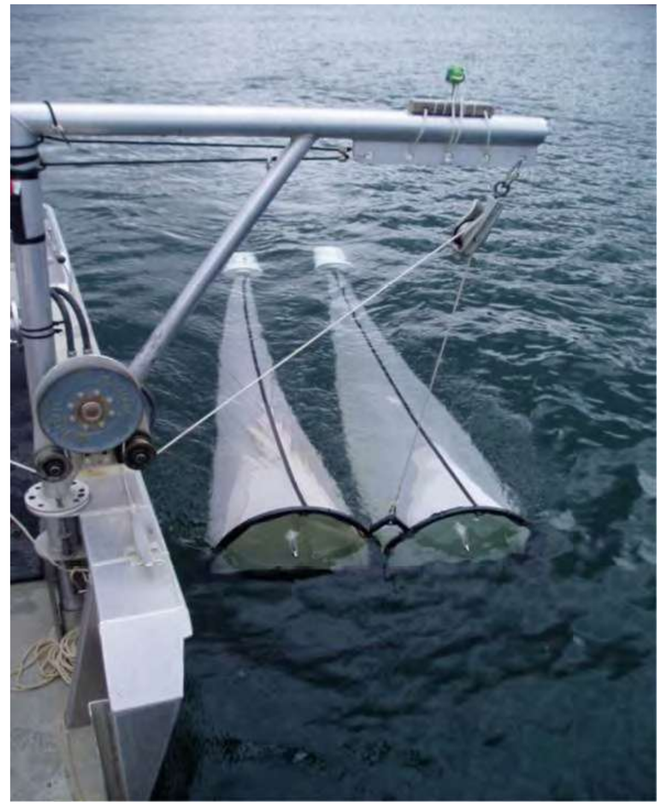
- Aim: to **verify ongoing (or not ongoing) natural reproduction of the sterlet in the Slovak part of the Danube**

- Methods: catch of STURGEON larvae using special ichthyoplankton nets (equipped by mechanical flowmeter and collection chamber), drifting by boat downstream

- Target area: Danube below the Gabčíkovo water construction (historical natural spawning places, rkm 1708-1809)

- sampling frequency: once a year (late spring – based on thermal and hydrological condition), 2025 - 2030

- **current status:** in preparation; **2024:** The activity will not take place.



Thank you for your attention.

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