DANUBE REGION strategy
Water Quality

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EUSDR PA4 workshop
Connecting the dots for migratory fishes

7 October 2025
Budapest, Hungary

SWIM project

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SWIM

Sustainable Water and Integrated Management
of Fish Migration and their Habitats in the Danube
River Basin and NW Black Seas

University of Zgreb, Faculty of Mechanical Engineering and Naval Arhitecture (UNIZAG FSB)

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SWIM

- The Faculty of Mechanical Engineering and Naval Architecture – constituent unit of the University of Zagreb, one of 36 faculties. University counts over 63000 students and more than 7900 teachers

- UNIZAG FSB: 14 Departments, 42 Chairs, 54 Laboratories, 74 PhD students, 350 Researchers, >2500 Students

- Project is led by team from **Department of Energy, Power and Environmental Engineering**

- **Extensive expertise in** multi-instance data access & management, system design, data visualization, and interface development. Supporting complex technical projects that require innovative engineering solutions and integration of digital tools

KEY CONTACTS
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EcoDaLLi

DaWetRest

Interreg — Co-funded by the European Union
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ADRIONWIND

SOS2LearnDBS

Interreg Euro-MED — Co-funded by the European Union
GARDEN

DANSER

Interreg Danube Region — Co-funded by the European Union
StoreMore

Interreg CENTRAL EUROPE — Co-funded by the European Union
AGRI-DIGITAL GROWTH

Interreg Euro-MED — Co-funded by the European Union
AZA4ICE

Hrvoje   Filip   Stela   Alina

Petar   Ana G.   Ana R.   Katarina

Tibor

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General information on the project

CALL:**HORIZON-MISS-2024-OCEAN-01-Actions for the implementation of the Mission Restore our ocean and waters by 2030**

TOPIC:**HORIZON-MISS-2024-OCEAN-01-02**

42 participants

- 26 beneficiaries
- 16 associated partners
- 16 countries involved

Duration:	• 48 months
Project Coordinator	• UZ-FSB
Start date:	• September 1st 2025
End date:	• August 31st 2029
Budget	• 8,2 M€

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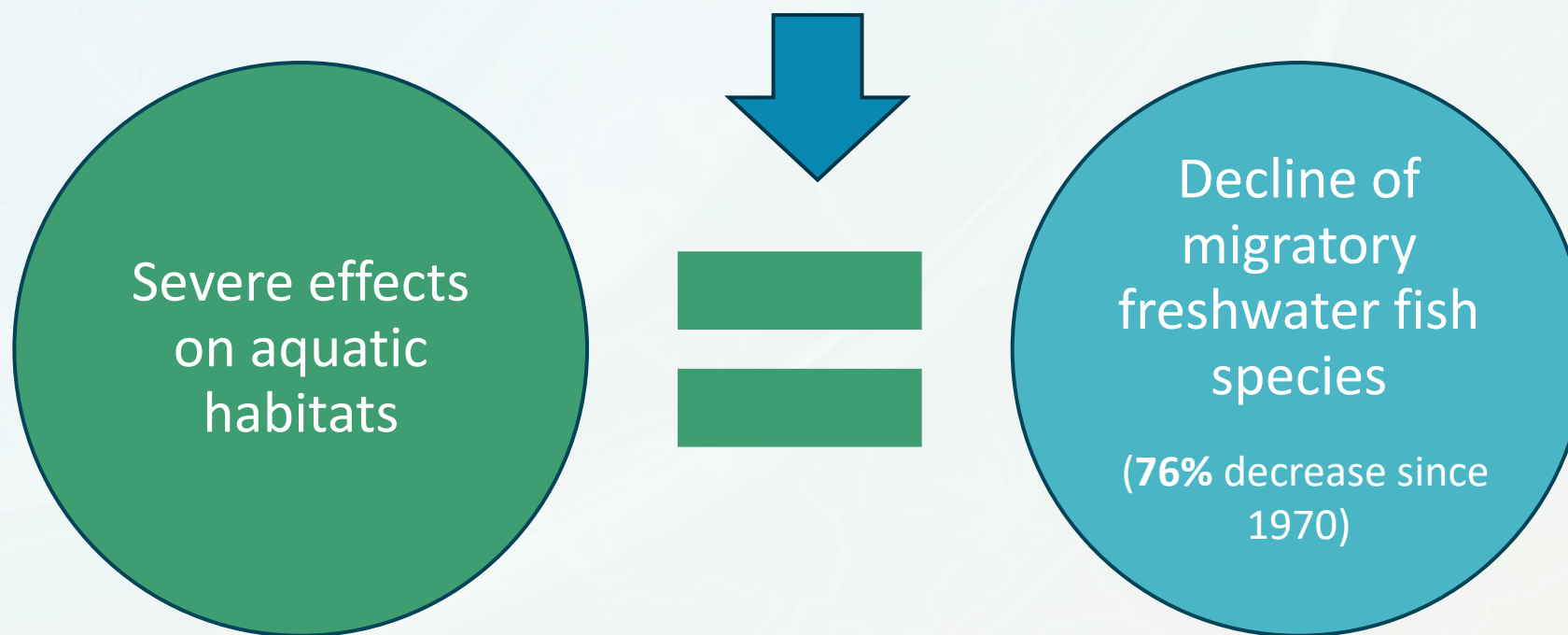EU MISSIONS
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SWIM Project at a Glance

- **9** identified challenges
- **9** proposed innovations
- **3** Specific Objectives to achieve
- **32** KPI linked to the SO
- **7** Work Packages > 38 Deliverables
- **13** pilot reference sites / activities
- **13** Key Exploitable Results

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SWIM Project at a Glance

- **Freshwaters under significant threat** – anthropogenic stress, hydromorphological alterations, land use change, invasive alien species, climate changes

Severe effects on aquatic habitats

=

Decline of migratory freshwater fish species

(**76%** decrease since 1970)

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SWIM Project at a Glance

Challenges tackled by SWIM:

C1: Loss/deterioration of migratory fish species habitats

C2: Insufficient protection and lack of cooperation between crucial bodies and stakeholders

C3: Lack of practice, expertise and infrastructure to apply the best methodology for migratory fish habitats/species monitoring

C4: Limited adoption and scalability of NBS oriented approaches in migratory fish habitats restoration

C5: Insufficient response to climate change as a cause of migratory fish habitats deterioration

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SWIM Project at a Glance

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Challenges tackled by SWIM:

C6: Lack of demonstrated digital solutions for migratory fish habitats improvement and their integration into the Digital Ocean and knowledge system

C7: Lack of communities' involvement and clearly defined socio-economic benefits for local and regional

C8: Unequal opportunities for organisations to participate in restoration actions at national level

C9: Insufficient implementation of the EU and regional policies addressing migratory fish species and habitats, especially at the local level

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SWIM Project at a Glance

To address connectivity disruption and support the recovery of migratory fish species first step is comprehensive planning for:

Identifying

key habitats

Enhancing protection

of key habitats

Restoring

key habitats

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SWIM Project at a Glance

SWIM project targets:

1) **Identification of key habitats** of migratory fish species along selected river stretches in the Danube River Basin and the Northwestern Black Sea coast

2) **Restoration of habitat connectivity** and quality by using nature-based solutions

3) **Proposing** the **establishment** of several **strictly protected habitats** (sanctuaries) in the Danube River Basin and Northwestern Black Sea coast

4) **Preservation** of the **native genotypes** of several migratory fish species by building **two** ex-situ **conservation facilities** (Middle and Lower Danube basins) to breed fingerlings and launch supportive stocking programs

SWIM Project at a Glance

SWIM project targets:

5) **Testing** several **innovative approaches** to assist water management in foreseeing adaptation measures **to increase resilience** of the aquatic environment

6) **Establishing** a **platform** for experts and relevant stakeholders for the conservation of migratory fish

7) **Creating a network** of info-points **to raise** basin-wide **public support** for the protection of migratory fish species and their habitats

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SWIM Specific Objectives and KPIs

no.	Specific Objective	Associated KPIs
1	**To contribute to the implementation of EU and regional policies on the protection and restoration of migratory fish habitats**	**KPI#1:** Support the implementation of at least 7 EU and 7 national policies on the protection, restoration and conservation of migratory fish habitats(D2.2, D2.4-7, D2.9, D4.3, D5.2)
		KPI#1.2: Engage 40 stakeholders to support the enhancement of the protection status for migratory fish habitats(D3.6, D5.3)
		KPI#1.3: Publish 12 scientific papers (Open Access) during the project implementation(D2.4-7, D3.4-5, D5.3)
2	**To establish an integrated online tool for data collection related to the habitats of migratory fish species with the aim to support Mission's Digital Ocean and Waters**	**KPI#2.1**: Develop 1 online data collection tool and successfully integrate data from pilots, synergy projects, and at least 10+ sources into the SWIM platform (D3.2-3, D4.7)
		KPI#2.2: Develop and integrate at least 5 hydrological models into the SWIM platform (D3.5)
		KPI#2.3: Engage at least 50 stakeholders across different sectors and regions in using the platform (D6.5)
3	**To demonstrate concrete, effective, ecological friendly, sustainable solutions for the improvement of migratory fish species habitats**	**KPI#3.1**: 7 pilots established (D4.5-6)
		KPI#3.2: active and passive restoration measures at 13 reference sites completed (D4.1, D4.3, D4.6-7)
		KPI#3.3: at least 150 field observations, l7 monitoring sites, 1 fish breeding activity, 1 activity contributing to ex-situ conservation, and 3 restoration works for river connectivity improvement (D4.2, D4.4, D4.7)
4	**To contribute to the protection and improvement of the migratory fish species status in the DRB and NW Black Sea by a strong helix approach with the involvement of associated regions**	**KPI#4.1**: Involve 30 managing organisations from protected areas, local authorities, and other stakeholders through the SWIM Alliance (D6.2)
		KPI#4.2 Ensure the involvement of minimum 50 organisations in the Mission Charter(D6.5)
		KPI#4.3: Generate 1 local plan for the protection and restoration of migratory fish habitats (D5.2)

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SWIM Specific Objectives and KPIs
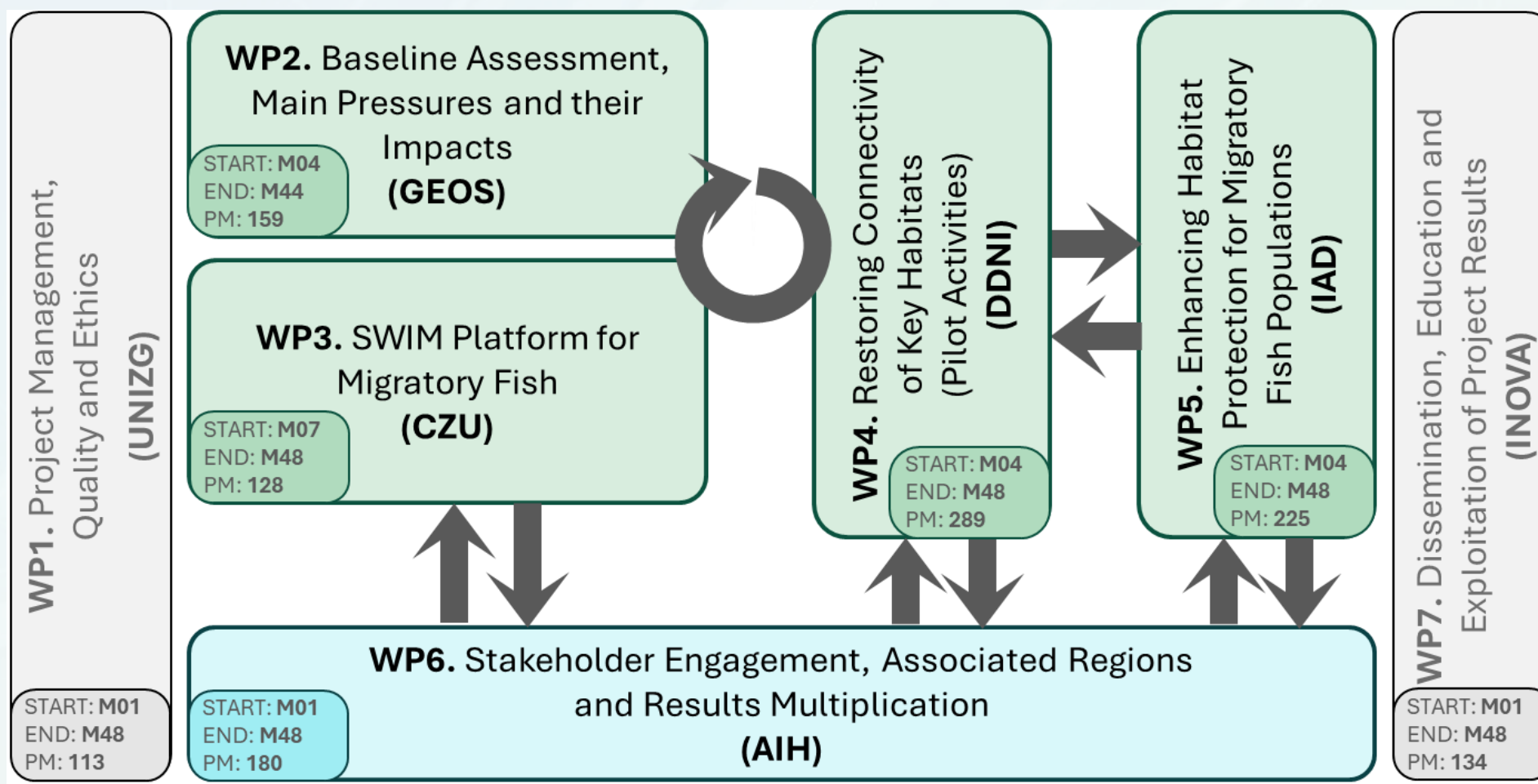
no.	Specific Objective	Associated KPIs
5	To evaluate the pressures on migratory fish habitats and to provide recommendations for multisectoral, interdisciplinary response against migratory fish habitat loss	**KPI#5.1**: Monitor selected pollutants in the pilot sites and establish 1 database on water quality (D2.2, D2.4) **KPI#5.2**: Assess at least 7 specific pressures on selected habitats and provide 1 set of recommendations to mitigate them (D2.2, D2.4-7, D2.9)
6	To highlight the socio-economic benefits of the recovery of migratory fish populations and raise support of local communities for the protection of selected key habitats	**KPI#6.1**: Implement 3D-Demonstrators for 7 pilot activities, showcase them in presentations, and deploy web variants for stakeholders (D6.2) **KPI#6.2**: Develop 3 foresight scenarios for local communities and Danube Lighthouse stakeholders (T3.4)
7	Contribute to the establishment of strictly protected habitats for migratory fish species in selected river stretches of the Danube River Basin	**KPI#7.1**: Conduct 1 baseline assessment in selected riverine habitats and provide recommendations to mitigate the identified pressures (D2.2, D2.4, D2.9) **KPI#7.2**: Propose at least 7 key habitats to be declared strictly protected areas in selected river stretches of the Danube River Basin (D5.2)
8	To pave the way for establishing strictly protected areas ("no-take zones") for selected key habitats of migratory fish species in NW Black Sea	**KPI#8.1**: Identify 4 key habitats in the NW Black Sea (D4.5) **KPI #8.2**: Conduct 1 baseline assessment of selected marine habitats and provide 1 set of recommendations to mitigate the identified pressures (D4.6, D5.2)

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SWIM Specific Objectives and KPIs

no.	Specific Objective	Associated KPIs
9	**To provide policy recommendations regarding concrete measures to increase protection of selected key habitats for migratory fish species**	**KPI#9.1**: Provide policy recommendations to establish at least 7 strictly protected habitats in selected river stretches, and at least 2 strictly protected habitats in the NW Black Sea (D5.2)
10	**To strengthen the protection status of selected key habitats by raising awareness and support of major stakeholders in the DRB and NW BS regions**	**KPI#10.1**: Conduct 12 national workshops and involve at least 80 stakeholder organisations in public consultation (T6.2, T6.4, D7.3) **KPI#10.2** Adopt 1 roadmap for enhancing the protection status of migratory fish habitats in river and sea (D5.3)
11	**To capitalise results of former projects and ensure synergies with running projects relevant for the protection of selected key habitats of migratory fish species**	**KPI#11.1**: Consult at least 3 former projects relevant for migratory fish habitats to prepare SWIM outputs(T6.1) **KPI#11.2**: Create synergies with at least 5 relevant projects in the Danube Lighthouse (T7.4) **KPI#11.3**: Identify at least60 relevant stakeholders from previous/ongoing projects and involve them in the SWIM project (D6.1)
12	**To replicate and scale-up key project results at basin wide level and beyond the project area**	**KPI#12.1** Engage at least 5 Associated Regions through the SWIM open call (D6.4) **KPI#12.2**: Establish 1 SWIM Alliance and involve stakeholders from each partner country (M6.2) **KPI#12.3** Develop 1 action plan for replication and scaling up of project results (D6.5)
13	**To ensure the accessibility of key project results and raise basin-wide public support for the protection and conservation of migratory fish species**	**KPI#13.1**: Launch the project website in English and 8 Danube languages (T7.1) **KPI#13.2**: Translate a summary of key project results in 8 Danube languages and make them available on the project website (D7.3) **KPI#13.3** Establish at least 14 info-points for awareness raising across the Danube River Basin and NW Black Sea (T7.4)

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Work plan and WP relations

WP1. Project Management, Quality and Ethics **(UNIZG)**
START: **M01**
END: **M48**
PM: **113**

WP2. Baseline Assessment, Main Pressures and their Impacts **(GEOS)**
START: **M04**
END: **M44**
PM: **159**

WP3. SWIM Platform for Migratory Fish **(CZU)**
START: **M07**
END: **M48**
PM: **128**

WP4. Restoring Connectivity of Key Habitats (Pilot Activities) **(DDNI)**
START: **M04**
END: **M48**
PM: **289**

WP5. Enhancing Habitat Protection for Migratory Fish Populations **(IAD)**
START: **M04**
END: **M48**
PM: **225**

WP6. Stakeholder Engagement, Associated Regions and Results Multiplication **(AIH)**
START: **M01**
END: **M48**
PM: **180**

WP7. Dissemination, Education and Exploitation of Project Results **(INOVA)**
START: **M01**
END: **M48**
PM: **134**

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Key exploitable results

Exploitable Results	Target Group	Actions
Integrated Digital Platform for River Basin Management	Government	Government agencies and environmental organizations will implement and operate the platform for managing river basin data, optimizing water management strategies, and tracking conservation efforts.
Nature-Based Solutions (NBS) Toolkit for Habitat Restoration	Engineers	Environmental consultancies and restoration agencies will apply the toolkit to design and execute nature-based solutions for restoring and protecting habitats.
Drone-Based Monitoring and Mapping System	Researchers	Research institutions and conservation agencies will use the drones to monitor habitats, assess restoration effectiveness, and analyse ecological changes.
AI-Driven Predictive Models for Fish Habitat Restoration	Researchers	Researchers and environmental consultancies will use the AI models to predict outcomes and optimize habitat restoration strategies.
Blockchain-Based Data Management and Transparency System	Government	Governments and industry stakeholders will adopt the blockchain system to enhance the transparency, security, and reliability of data sharing across conservation and management projects.
Hydrological Model of the Danube River	Engineers	Governments and environmental organizations will use the hydrological model to make data-driven decisions on water resource management and ecosystem conservation.
VR-Based Stakeholder Engagement Tool	Citizens	Educational institutions and public awareness campaigns will utilize the VR tool to engage stakeholders and educate the public about migratory fish conservation and habitat restoration.
Biotelemetry Network for Real-Time Fish Migration Tracking	Researchers	Research institutions and conservation agencies will deploy the biotelemetry network to track fish migration patterns in real-time, supporting data-driven conservation strategies.
Advanced Ex-situ conservation Programs for Migratory Fish Conservation	Researchers	Fish hatcheries and conservation projects will implement advanced ex-situ conservation programs for supportive stocking and strengthening of endangered migratory fish populations

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Pilot activities

#	Reference sites	Strengthening wild populations		Habitat monitoring & modelling		Fish habitat restoration (NBS)			Increasing habitat protection	
		Fish monitoring, detect key habitats	Ex-situ conserv. supportive stocking	Habitat quality monitor.	Hydrol. model, forecast	Water quality improvement	Connectivity restor.	Climate change mitig.	Propose strictly protect. habitats	Community engagem. & education
1 - CZ	RS1.1 Dyje/Thaya river basin			○	●			●		○
2 - SK	RS2.1 Res. NBS, fish passage in River Hornád				○		●	○	○	○
3 - HU	RS3.1 Monitor fish migration in Szigetköz area	●			○			○	○	○
4 - HR + BA	RS4.1 River Drava side-arm Noskovacka bara				○	●	●	○	○	
	RS4.2 Breeding, adapt. juveniles to new habitat		●		○			○		○
	RS4.3 Assess. migratory fish habitats in Vukovar-Srijem County			●	○		○	○		
	RS4.4 Starača and Tišina Swamps		○	●	○		●	○		
5 - RS	RS5.1 Danube River South Bačka District			●	○			○		○
6 - RO	RS6.1 Fish passage at Iron Gates II dam	●		○	○			○	○	
	RS6.2 Monitor. fish migration, def. strictly protected habitats	●		○	○			○	○	
	RS6.3 Ex-situ conserv., aquaculture fish pond		●		○			○		○
7 - UA	RS7.1 Monitor. fish migration in Kylia Delta; propose strictly protect. habitats	●			○			○	○	○
	RS7.2 Monitor quality of migratory fish habit.			●	○			○		

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Wrap up

- The **SWIM** project will **strengthen several key aspects of migratory fish conservation**, with a focus on species in poor conservation status within the Danube River Basin (DRB) and the NW Black Sea coast
- By investigating the habitats of long-distance migratory species **from the Black Sea to the Iron Gates II dam** and **Danube upstream sectors and tributaries**, **SWIM** will foster **transnational cooperation** among stakeholders and local communities to enhance protection efforts
- The project will involve **13 pilot site studies** focusing on strengthening wild populations through **migration monitoring**, **habitat monitoring** and **modelling**, **fish habitat restoration** using **nature-based solutions** (NBS), and increasing **habitat protection**. It will also support **ex-situ conservation** efforts in the Middle and Lower Danube **regions, where stabilizing biodiversity is important to keep ecological balance**

THANK YOU
FOR YOUR ATTENTION!

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