WePass2 | FACILITATING FISH MIGRATION AND CONSERVATION AT THE IRON GATES

WePass2

Pilot Project: Making the Iron Gate Dams passable for Danube sturgeon

Marq Redeker
Julia Gatzweiler

Feasibility Study results

This action has received funding from the European Union

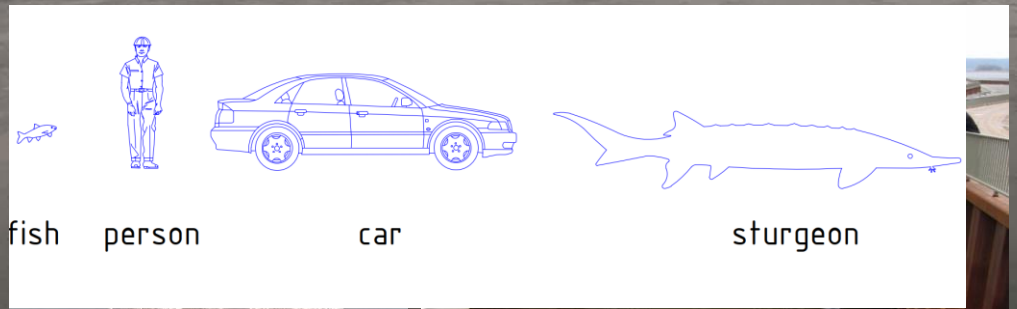
EUSDR PA4 & DSTF Workshop
7 October 2025

WePass is about …

Multi-species fish passage restoration at the Iron Gate focusing on sturgeon

Downstream passage facilitation/ improve fish survival
(Sturgeon: focus on juvenile & adult fish)

Downstream Passage Facility
Ice Harbor Dam (Snake River, USA)

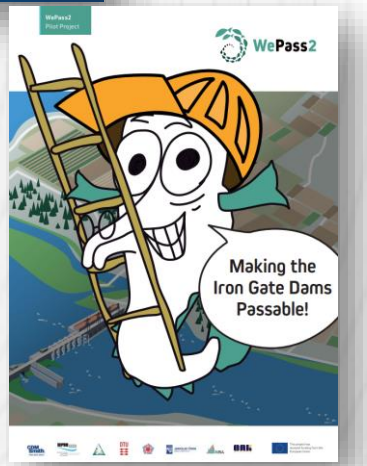


Fish Lift, Safe Harbor Dam (USA)
Photo: https://susqnha.org/riverroots-power-of-the-river/

Upstream passage restoration
(Sturgeon: focus on adult fish)

WePassed the Finish Line …

- Final Report includes
  - all options and preliminary designs of 3 fish passes
  - fish telemetry results
  - roadmap for further project implementation
  - cost estimate
  - hydropower generation loss estimate
- Approved by European Commission DG ENV on 21 Nov. 2024
- Project Flyer (for laypeople)



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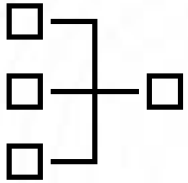
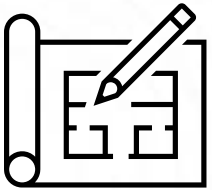
EC Service Contract Objectives

Status quo assessment & basic data

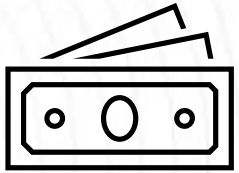
Options Study



Preliminary design of preferred options



Economic aspects



The main objective of this open call for tender is a feasibility study analysing the options to establish fish migration at the Iron Gates that would include:

- a concept of preliminary design of fish pass(es) at Iron Gates comprising all the technical elements.
- a cost estimate for the construction of the fish pass(es)

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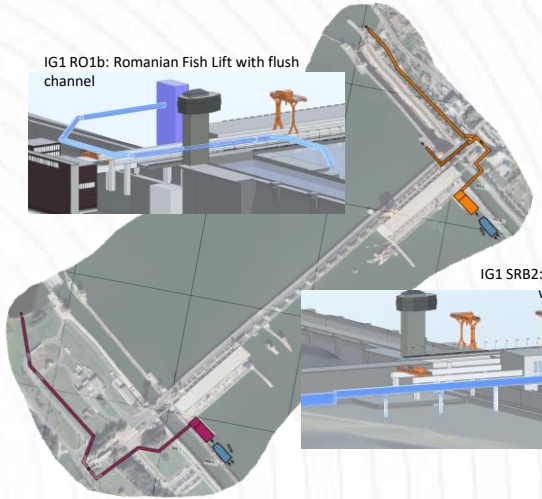
Options Study: Preferred Fish Passage Options

- Upstream passage:
  - Iron Gate 1: 2 Fish Lifts (1 each in RO and SRB)
  - Iron Gate 2: 1 Hybrid Fish Pass (RO)
    1 Vertical Slot Pass and 1 Fish Lift (SRB)
  - Gogoşu: 1 Vertical Slot Pass

- Downstream passage:
  - Reduction of intake screen spacing
  - Turbine management
  - Spillway bypasses as safe passageways
  - Fish-friendly turbines in IG2 SRB



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Downstream Passageways and Hazards Assessment

Sustainable Energy Technologies and Assessments 43 (2021) 100903

Contents lists available at ScienceDirect

Sustainable Energy Technologies and Assessments

journal homepage: www.elsevier.com/locate/seta

ELSEVIER

Original article

The European Fish Hazard Index – An assessment tool for screening hazard of hydropower plants for fish

Ruben van Treeck [a,*,1], Johannes Radinger [a], Richard A.A. Noble [b], Franz Geiger [c], Christian Wolter [a]

[a] Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm 310, 12587 Berlin, Germany
[b] Hull International Fisheries Institute (HIFI), Department of Biological and Marine Sciences University of Hull, Hull HU6 7RX, United Kingdom
[c] Technical University of Munich, Versuchsanstalt für Wasserbau und Wasserwirtschaft, Obernach 15, 82432 Walchensee, Germany

Aerial: GoogleEarth

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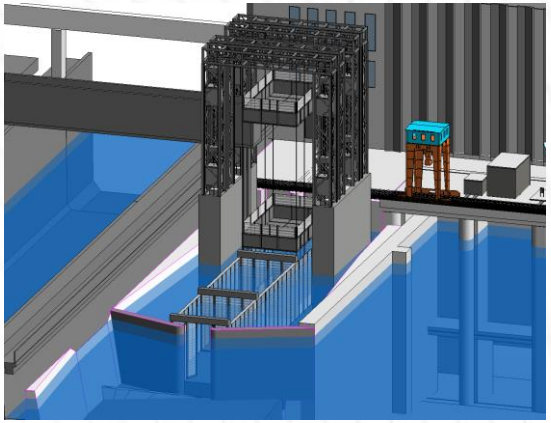
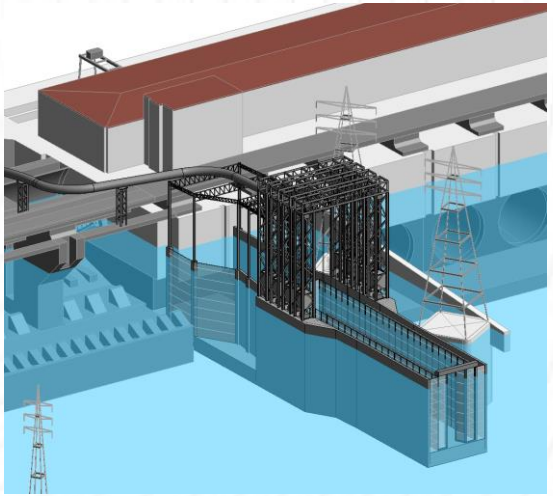
Preliminary Design Examples

Romanian hybrid fish pass Iron Gate 2

Serbian fish lift Iron Gate 1



Serbian fish lift Iron Gate 2



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Cost Estimate

Dam & Facilities	Costs (million €)
Iron Gate 1	
Upstream fish passage (2 fish passes)	147.4
Downstream passage improvement (2 surface bypasses, reduction of trash rack bar spacing)	18.8
Subtotal IG 1	***166.2***
Iron Gate 2	
Upstream fish passage (4 fish passes)	489.9
Downstream passage improvement (spillway bypass, reduction of trash rack bar spacing)	9.3
Subtotal IG 2	***499.2***
Subtotal (net)	**665.4**
Contingency (20%)	133.1
Total cost (net)	**798.4**

➢ Costs correspond to **approx. 7.5 months of revenue of IG Scheme or**

	IG fish passage investments compared with	
	Revenue 2023	Operating profit 2023
Hidroelectrica	16%	27%
EPS	9%	42%

Annotations:
- Cost estimation according to DIN 276:2018-12
- Cost includes:
  - Construction of all preferred fish passage facilities
  - Engineering design and planning
- Central European unit costs applied (Contractors with special civil engineering skills will be required)

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In perspective: What else does one get for 800 m€?

20 km of A8 Highway (Romania)
Photo: www.romania-insider.com

3.4 F-35A fighters
© German Ministry of Defence

25-Millionen-Euro-Vorlagen

Sondervermögen: Bundeswehr kann 35 F-35A für rund 8,3 Milliarden Euro kaufen

The alternatives
This article is more than 2 months old

'It was filthy and it stank terribly': how Europe's dirtiest river was brought back to life

A €5.5bn project has transformed the Emscher from 'the sewer of the Ruhr' to a place where nature is starting to flourish
By Ajit Niranjan in Castrop-Rauxel

© www.theguardian.com

Notre Dame Cathedral (Paris) reconstruction ~700 m€
Photo: www.dw.com

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Cost Comparison with Upstream Fish Passage Investments in Rhine River

River section opened to upstream migration	Number of barriers in section	Length of river section opened	Specific investment per MW installed	Specific investment per rkm opened
	(-)	(rkm)	(k€/MW)	(k€/rkm)
Lower and Middle Danube River (Black Sea to Gabčíkovo Dam)	2	1,816	**265**	**421**
Rhine River (Haringvliet/ Afsluitdijk to Vogelgrün)	11	803	**482**	**511**

- **Specific investments notably higher on the Rhine River** than projected specific costs* for the Iron Gate
  * per MW installed capacity and per river kilometers opened
- **Investment** required **at Iron Gate is not disproportionate!**

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A Look over the Rim of the Tea Cup

Fish passes at Rhinau and Marckolsheim HPP (Rhine River) currently under construction

- Estimated costs: 80 million € total
- HPP design flows ~1,500 m³/s each
- Fish pass flows: max. 30 m³/s each
  ⇨ 2% of HPP design flow

comparison with Iron Gate:
IG1 ⇨ 1.3% of HPP design flow
IG2 ⇨ 2.6% of HPP design flow

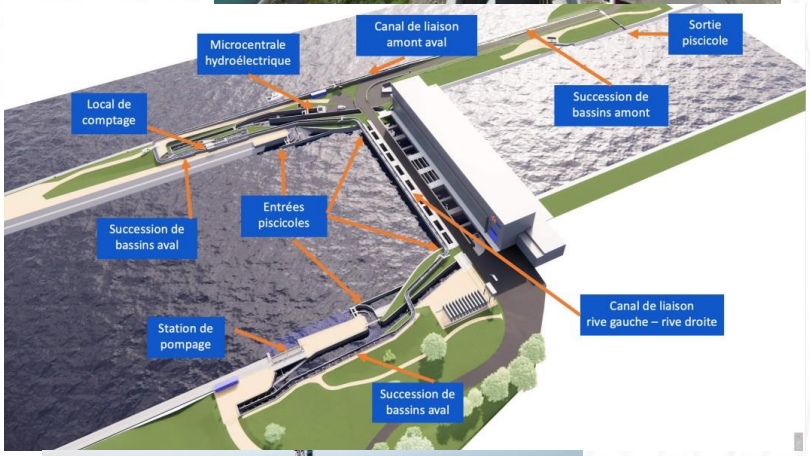

Illustration & photos:
Rhinau fish pass (France)
© EDF

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Estimate of Iron Gate HPP Generation Loss

Setting #1 (Auxiliary flow of certain fish passes is used for power generation at Iron Gate 2)	IG Scheme generation loss (MWh/a)	IG Scheme generation loss (% of annual generation)
Preferred downstream passage facilities	228,176	1.57%
Preferred upstream passage facilities	262,315	1.80%
Total	**490,491**	**3.4%**

Setting #2 (Auxiliary flow of certain fish passes is not used for power generation at Iron Gate 2)	IG Scheme generation loss (MWh/a)	IG Scheme generation loss (% of annual generation)
Preferred downstream passage facilities	228,176	1.57%
Preferred upstream passage facilities	330,287	2.27%
Total	**558,463**	**3.8%**

- **Generation losses comparable to** those **of other large hydropower schemes**, e.g. Columbia River in USA
- **Reduction in power companies' annual energy sales***:
  1.3% for Hidroelectrica
  0.7% for EPS
  * based on companies' figures for 2023 and assuming 50/50% share of generation loss

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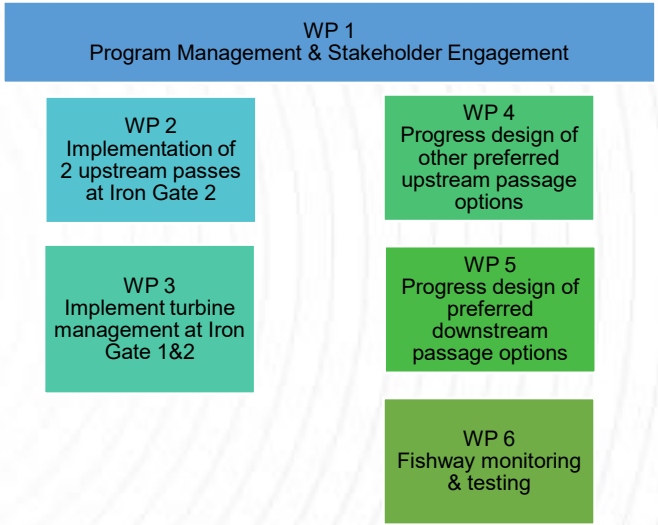
Programme towards Implementation

- Comprehensive programme of 6 work packages running in parallel
- Suggest to proceed with:
  Design, permitting and implementation of 2 upstream fish passes at Iron Gate 2 (hybrid fish pass in RO and fish lift in SRB) and
  Implementation of turbine management (total: 323 m€, min. 8 years)



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Brief Summary

- Need for both upstream fish passage restoration and downstream passage improvements
- **Up- and downstream fish passage restoration is feasible at the Iron Gates:**
  - Suitable facilities/ enhancement measures were identified and developed.
  - Up- and downstream passage restoration require separate facilities/measures
  - Dam & site-specific solutions, e.g. different types of fish passes with special technical elements
- Upstream fish passes:
  - Multiple fishways and entrances at Iron Gate 1 & 2
  - These fish passes will be among largest and most complex facilities in the world. Number of such facilities at large dams/rivers is small compared to overall number of fish passes worldwide.
- Downstream fish passage:
  - Focus fish protection on target species, i.e. the diadromous species and sturgeon in particular (identified measures will benefit other coarse fish populations, too)
  - Limit turbine entrainment. Increase turbine survival / HPP passage with finer intake screens and bypasses.
  - ??? regarding diadromous fish behaviour. These need to be investigated to enable specific designs.

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What can EUSDR PAs, DSTF and ICPDR do to support

- **WePass2 Final Report and appendices shared with *Joint Serbian-Romanian Commission for the Iron Gates*** in Feb./Apr. 2025 incl. our repeated offer to present the study results. ⇨ **No feed-back to date**
- Need to convince the EC DGs (ENV, ENER and REGIO), SRB and RO Ministries and Joint Commission for the Iron Gates **to prioritize this restoration measure "item" on their agendas.**
- **Leverage other networks** like IUCN, European Habitats Forum …
- Use relevant **EU policy frameworks** for alignment and to **establish European significance**.
  Quantify **ecosystem services benefits**, e.g. biodiversity recovery.
- Member States must submit their draft **National Restoration Plans** to the EC by 1 Sep. 2026, acc. to the EU Nature Restoration Regulation. These plans need to contain detailed measures to achieve the restoration targets. Public participation is ongoing in several countries.
  ⇨ **Nominate Iron Gate fish passage restoration as a detailed measure in the NRP** and **integrate it into other National Policy Instruments**, e.g. National Biodiversity Strategies and Action Plans.
- **Romanian concessions for IG HPPs need to be renewed** in the next years ⇨ include licensing conditions
- **Mobilize / support funding**, e.g. EU Cohesion Funds, LIFE+, EIB …

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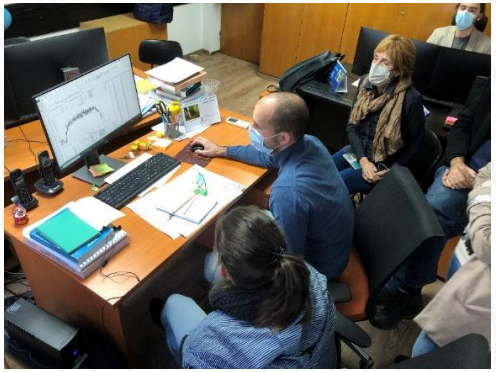

Thank you!

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