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Presentation a technical solution that can achieve longitudinal connectivity (upstream-downstream) of the Crișul Repede River

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"Presentation of a technical solution to achieve longitudinal connectivity (upstream-downstream) of the Crișul Repede River"

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CASE STUDY
LOCATION

Crișul Repede River

România

discharge sill
The paper presents a case study that proposes practical solutions for the restoration of longitudinal connectivity of Crișul Repede River.

In the town of Oradea there are a lot transversal constructions such as discharge sills and small dams, that stops migration process of various fish species.
The Crisul Repede River bed width is 50 m at the discharge sill, it has 25.6 m³/s flow rate and its water speed is 0.4 m/s [Source: ABA Crisuri].

The migratory fish species from the area are:
- Nase (Chondrostoma nasus) - protected by Bern Convention (Appendix III).
- Barbell (Barbus barbus) - Rare species protected Habitats Directive (Annex V), annex 4A of Low nr.462 and Red List of RBDD)
- Freshwater bream (Abramis brama) - protected by Bern Convention (Appendix III)

Dimension for discharge sill near Ferdinand bridge
h=1,5m-height l= 50m-length h₁ (water fall )=1m
BACKGROUND

discharge sill near Ferdinand bridge
Figure 1 Positioning the metal semi-cylinder – indicative scheme
Figure 2 Rubber canal positioning – indicative scheme
Figure 3 Water level in the rubber canal – indicative scheme
Figure 4 Positioning the electric motor – indicative scheme
Conclusions

The solution, intended for one river bank only, has the advantage of being used as fish passage system upstream of discharge sill, too.

Another advantage of this system is that they can be dismantled and stored (during winter) and used in other areas where rivers are crossed by hydrotechnical works with transversal bars.

The costs for these systems are considered reasonable in contrast with conventional systems costs.

They can work automatically, as the human intervention is required only when it comes about supervision.
Thank you!
Vă mulțumesc!

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Concrete ramp positioning
Concrete ramp dimensions

h = 3, 8m

h1 = 1.4 m

l = 4m

L = 5, 52 m

H = 2.5 m (thickness)

discharge sill

cement bed

cement ramp

indicative scheme

Crișul Repede River
right bank  the metal grid 2  left bank
metal stopper  discharge sill
metal and concrete fences
metal bars
concrete ramp
crenelated metal rail
metal and concrete fences
indicative scheme
Metal grids positioning

Metal grids positioning
Crenelated rail positioning inside the concrete ramp
Telescopic hydraulic cylinder positioning on the metal frame and on the metal mobile grid 1
Metal frame fastening system

mobile metal grid 1

metal bar for opening the grid 2

the metal grid 2

rubber roller

rubber wheel

metal and concrete fences

concrete platform

indicative scheme

2 cm
Rollers positioning

- Rolling metal bar
- Rubber wheel
- Metal bar securing the metal frame
- Rubber wheel

Indicative scheme

[Link to Wikipedia article](http://en.wikipedia.org/wiki/Train_(roller_coaster))
Minimum and maximum levels of metal mobile grids 1 and 2
Rack railway

Metal grid refolding and system returning on horizontal surface

http://www.connectmums.com/wp-content/uploads/2012/03/Mt-Pilatus-Rack-Railway-3-540300.jpg
Concrete platform positioning
Conclusions

- The motor contains unsophisticated software to operate all controls.

- Power consumption is very low, considering that fish migration does not take place throughout the year and during the winter, when temperatures cause partial freezing of the watercourse, the mobile framework can be detached and stored in a properly place.

- The costs for these systems are considered reasonable in contrast with conventional systems costs.

- They can work automatically, as the human intervention is required only when it comes about supervision.
Thank you!

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