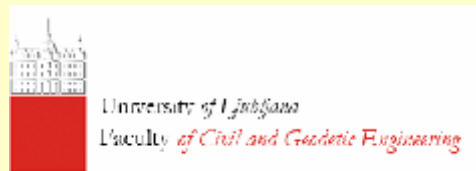




Stereo vision camera system for monitoring fish migration

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FISH PASSAGE 2016

UMassAmherst, 21 June 2016

European LIFE project – Ljubljana Connects



- The aim of the project is to improve connectivity of the Ljubljana river corridor
- Weir and two fish pass restoration
- Project movie available on YouTube



The last river spring near Vrhnika



The river in the city Ljubljana



Ljubljana in Zalog – lower part

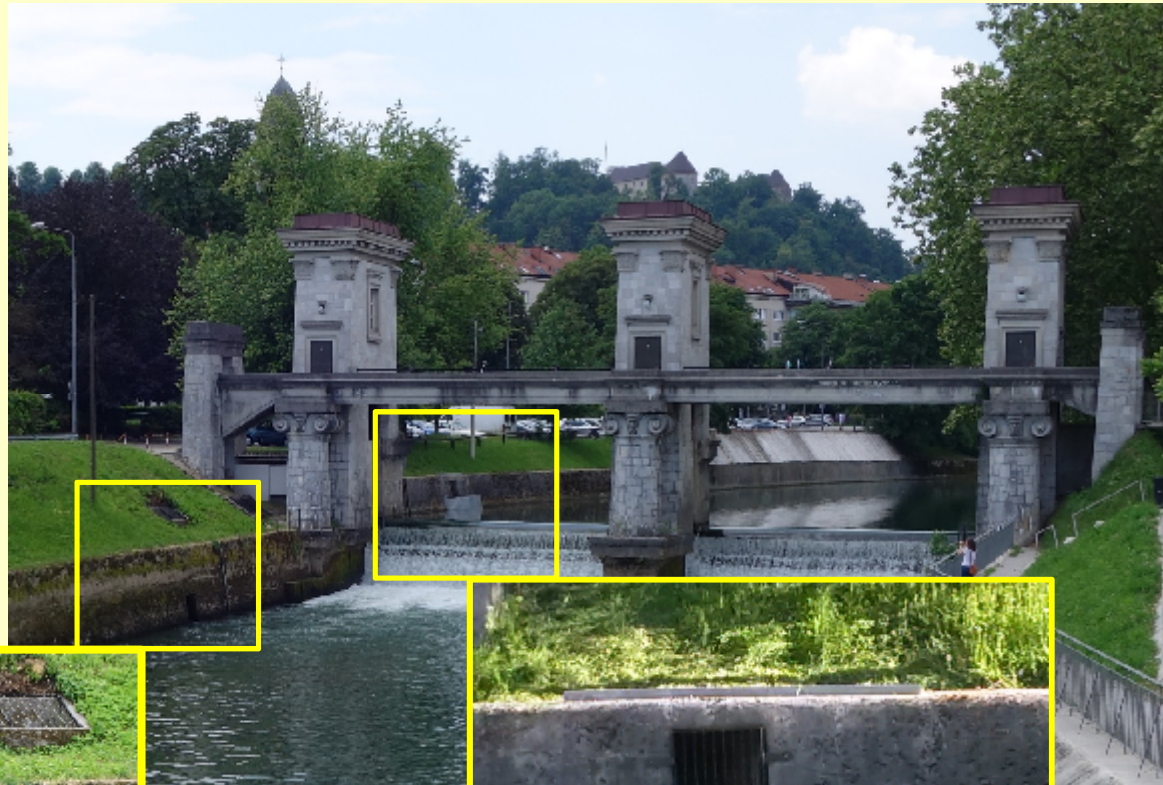
FISH PASSES IN THE LJUBLJANICA RIVER



- On the Ljubljana river there are two fish passes that were reconstructed during the project. First is the fish pass in the Ambrožev trg, and the second is a fish pass at the Fužine castle.



FISH PASS AMBROŽEV TRG



FISH PASS AMBROŽEV TRG



Fish pass Ambrožev trg was in poor condition before the reconstruction:

- concrete barriers between pools were destroyed
- floating debris block fish pass exit



Added pipe to improve attraction flow



FISH PASS FUŽINE



- more than 100 years old
- was partly destroyed during high water
- repaired with wooden wall
- added deflector at the exit of the fish pass



Videokopter.si



CAMERA FOR MONITORING FISH MIGRATION

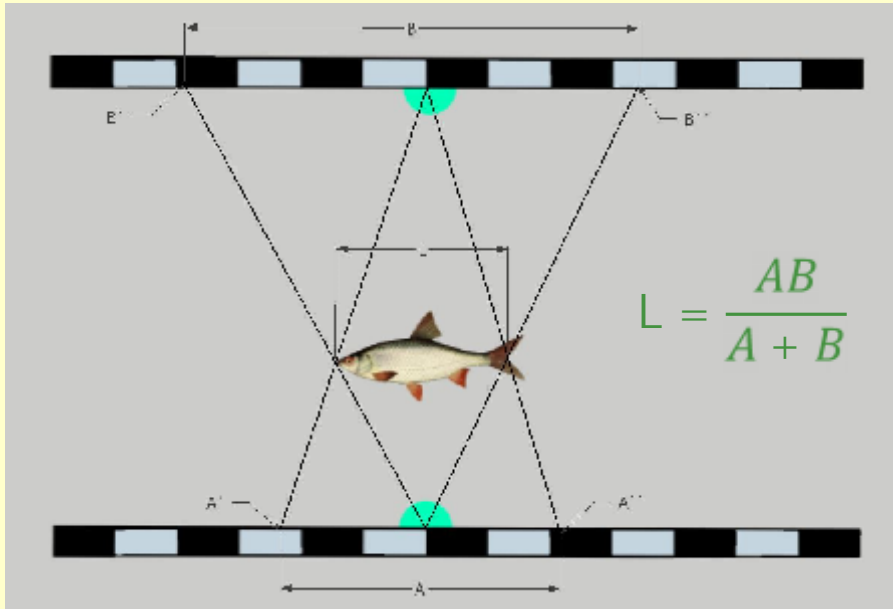


At the start of monitoring, in the summer of 2015 we install fish monitoring cameras at the Ambrožev trg and Fužine fish pass.

- motion detector is used to detect passing fish



UPGRADED CAMERA FOR MONITORING FISH MIGRATION



Properties of the dual camera system:

Fish length can be calculated, works better in dirty water, simple to install and maintain, low cost (around 4k €), robust (using 2 cameras), capture fish from both sides to see visual characteristics

What we used:

- Full HD high sensitive USB cameras
- Open source video surveillance software
- IR 850nm additional lighting



FISH CAMERA LIVE VIDEO STREAMING



All fish monitoring cameras have been upgraded to support 24/7 live video streaming. Live video streaming is available on our project website:

http://ksh.fgg.uni-lj.si/ljubljanaconnects/ANG/12_camera/,

or on YouTube, if you use a search keyword: ljubljana povezuje or fishcam.



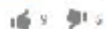
Life - Ljubljana povezuje FishCam Ambrožev trg

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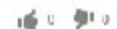


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PRELIMINARY MONITORING RESULTS



Klen (*Squalius cephalus*)



Mrena (*Barbus barbus*)



Danube salmon (*Hucho hucho*)



Zelenika (*Alburnus alburnus*)



Pisanka (*Alburnoides bipunctatus*)



Potočna mrena (*Barbus balcanicus*)

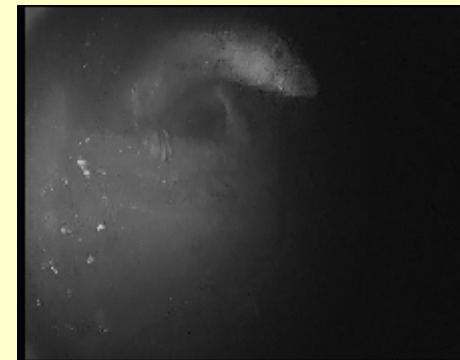
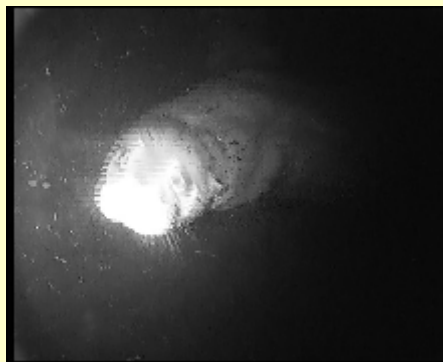
PRELIMINARY MONITORING RESULTS



Podust (*Chondrostoma nasus*)



The otter is a regular night visitor at the Fuzine fish pass:



PRELIMINARY MONITORING RESULTS



- The video monitoring system is working without any problem from the start of the monitoring.
- Live video streaming from fish pass is available on YouTube.
- The video monitoring system allows for detection of all fish species, including very small fish.
- Until now, at the fish passes at Ambrožev trg and the Fužine Castle, respectively, more than 200,000 images of fish have been taken.
- Seasonal variations in the number of fish migrating through the fish pass are very distinct. From early November to mid-March no fish were detected at the fish passes at Ambrožev trg and the Fužine Castle.
- We have, so far, partially analysed the images taken. We recorded at least 11 fish species migrating through the fish pass at Ambrožev trg.

UPGRADED CAMERA FOR MONITORING FISH MIGRATION

