Innovations II: Stereo Vision Camera System for Monitoring Fish Migration

Matej Sečnik
Geateh

Mitja Brilly
University of Ljubljana

Andrej Vidmar
Purgator

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Stereo vision camera system for monitoring fish migration

Matej SEČNIK, Mitja BRILLY, Andrej VIDMAR

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European LIFE project – Ljubljanica Connects

- The aim of the project is to improve connectivity of the Ljubljanica 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
Ljubljanica in Zalog – lower part
On the Ljubljanica 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 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
- more than 100 years old
- was partly destroyed during high water
- repaired with wooden wall
- added deflector at the exit of the fish pass
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
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/ljubljanicaconnects/ANG/12_camera/,

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