LIFE Segura-Riverlink as a *green infrastructure* approach to recover the longitudinal connectivity: preliminary data of the fish-based assessment

**LIFE + Environment Policy & Governance**

**Demonstration project** that aims to promote and support the environmental recovery of the Segura River basin.

**Aims**

To demonstrate and validate management measures for the development of a *green infrastructure* approach into the context of a Mediterranean river basin characterized by a high impact in its fluvial connectivity.

**Period** September 2013 – July 2017

**Total project budget** 3,424,250 € (49.8% EU)

**Action area**

Due to the historical pressures the Segura River is one of the most regulated rivers in Europe (more than 50 inventoried obstacles).

**Main actions**

- **Increase river connectivity**
  - Removal of an useless weir.
  - Construction of 8 fish passages (Bypass fishway, rock-ramp fishway and vertical-slot fishway have been selected according to their suitability for each action site).
  - Restoration of riverine vegetation at weir sections.

- **Social involvement and awareness**
  - Land custodity network (=fluvial stewardship) to involve stakeholders on the river management.
  - Education and volunteering programmes.

- **Monitoring and socio-economic assessment**
  - Operative indicators at fish passage systems (fish-based assessment).
  - Fish community and populations (fish-based assessment).
  - Bird community and river-bank associated fauna, vegetation communities, water and sediments.
  - Socio-economic assessment.

**Fish-based bioassessment**

<table>
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<tr>
<th>Fish-community metrics</th>
<th>Fish-populations metrics of sentinel species</th>
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<tbody>
<tr>
<td>(1) Species composition (2) Abundance, Biomass (Relative abundance index IRA), (Relative biomass index IRB), IRA/IRB, Diversity Index, (Well-being index) WIB. (3) Biotic integrity</td>
<td>(1) Size-Age distribution (2) Abundance, Biomass IRA, IRB sentinel species, etc. (3) Specimens status (% anomalies).</td>
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**Current outcomes**

- Initial evaluation of the fish-based assessment (October 2013 – April 2014) was completed with significant baseline data showing exotic invasive fishes as dominant and *L. sclateri* as the target species to assess changes at population levels.

  - Two main monitoring programmes are being developed, (1) Segura main channel monitoring and (2) Mark-recapture only in *L. sclateri*.
  - Indicative of progress – 74 sampling days from 15th September 2014 to 7th July 2015. Sampling effort was higher than the established in the initial design because electrofishings were strongly conditioned by high flows.

- 472 *L. sclateri* individuals > 25 cm length were marked by Anchor-Tag since October 2014. The aims are (1) to obtain information about fishes movements and (2) to develop an informative campaign on sport fishing anglers. 39.4% of recaptured specimens in 55 mark-recapture days.

  - The analysis of fish movement at fish passages will be initiated in 2016.

**Green Infrastructure (GI): a smart solution for today’s needs...**

**What is a GI?**

- A successfully tested tool for providing ecological, economic and social benefits through natural solutions.
- A strategically planned network of natural and non-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services.

**Level of actions**

- **Regional** – at the river sector of the project area
- **Local** – at river stretches next to the obstacle

**Sentinel-Indicator species**

- Cyprinid fishes
- Mainly native to the Iberian Peninsula (except bleak)
- Target species (reproductive seasonal movements)

**SE Iberian Peninsula**

18,670 Km²

- The project will be implemented on selected sites over a 54 km.
- In the Nature 2000 Network areas or linking them.
- Including urban areas as a means of facilitating stakeholder engagement.

- Fish home in good status in...
- The green highway of the Segura River will be free of obstacles in...
- Hydraulic infrastructures renovation.
- No future deterioration in fish migration.
- Achieve the maximum ecological potential in heavily modified waters.

**A long term view**

River Basin Management Plan (CHS)

**Beneficiary**

1. Departamento de Zoología y Antropología Física. Facultad de Biología. Universidad de Murcia. (fjoliva@um.es)
2. Faculty of Science and Technology, Centre for Ecology, Environment and Sustainability, Bournemouth University, Poole, UK.
3. ITAGRA.CT. Centro Tecnológico Agrario y Agroalimentario.
4. (Coordinating Beneficiary) Confederación Hidrográfica del Segura. (eduardo.lafuente@chsegura.es)

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