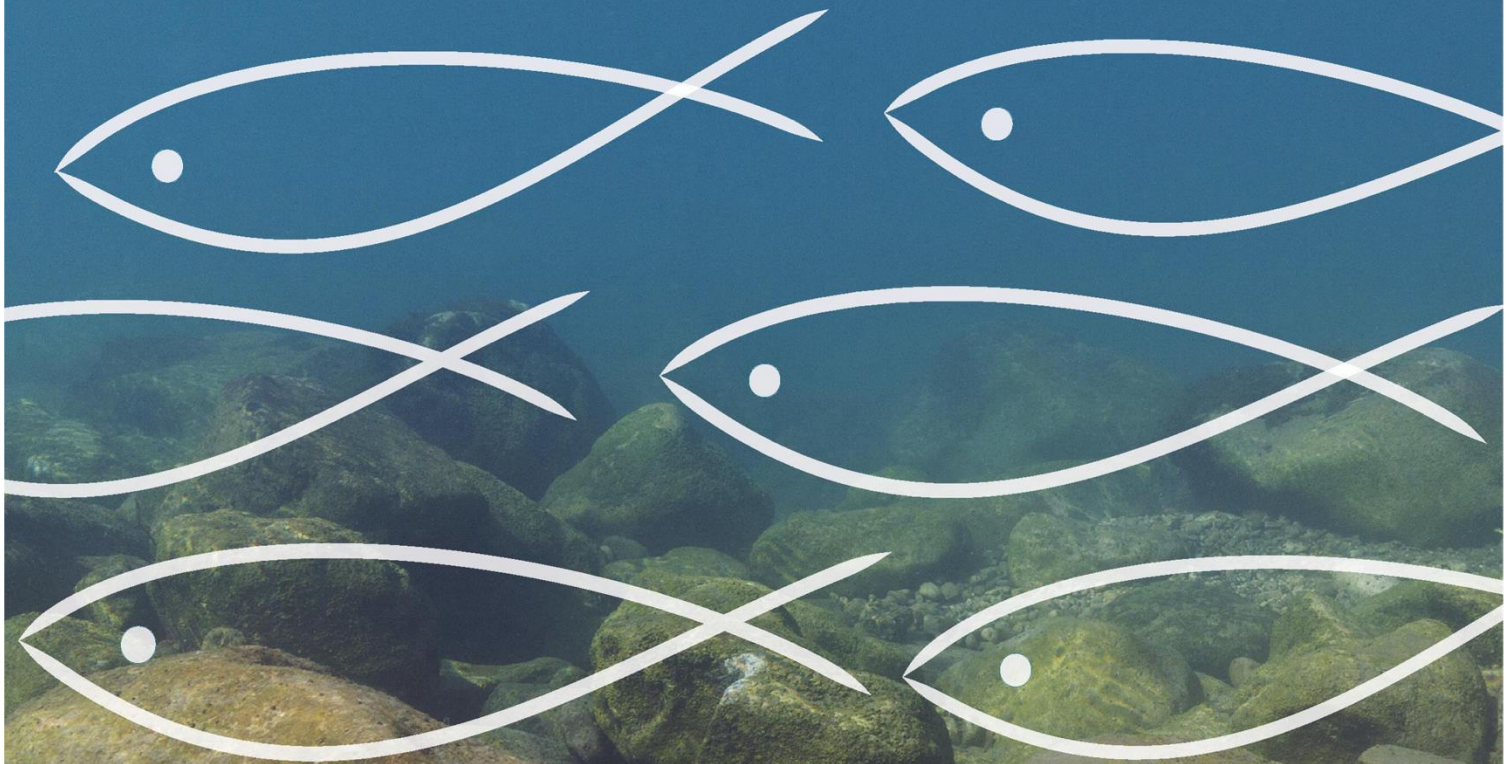




AÇÕES DE CONSERVAÇÃO E GESTÃO PARA PEIXES MIGRADORES NA BACIA HIDROGRÁFICA DO VOUGA

CONSERVATION AND MANAGEMENT ACTIONS FOR MIGRATORY FISH IN THE VOUGA RIVER BASIN

(LIFE16 ENV/PT/000411)



- Deliverable - Action C2:

Assessment of the Project's Socioeconomic Impacts



Trabalhos realizados no âmbito do projeto LIFE ÁGUEDA (LIFE16 ENV/PT/000411), com o financiamento do Programa para o Ambiente e a Ação Climática (LIFE) e contributos diretos para a conservação de espécies e habitats da Rede Natura 2000. Cofinanciado pela EDP – Gestão da Produção de Energia, S.A.



UNIVERSIDADE DE ÉVORA



MARE



Apoios Parceiros Coordenação

- Entregável - Ação C2 -

Relatório de Avaliação de Impactos Socioeconómicos das Ações do Projeto



Financiado pelo Programa LIFE para o Ambiente e Ação Climática



Edição:

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RESUMO

O projeto LIFE Águeda (LIFE16 ENV/PT/000411), implementado no concelho de Águeda, demonstrou como o restauro ecológico e a gestão sustentável dos rios podem gerar benefícios sociais, económicos e ambientais concretos. Através do restauro da continuidade fluvial, da reabilitação das galerias ripícolas e da promoção da conservação da biodiversidade, o projeto reforçou a ligação entre a saúde dos ecossistemas e o bem-estar das comunidades.

As ações desenvolvidas permitiram criar emprego direto e indireto, dinamizar a economia local e promover sinergias com setores regionais como as pescas, o turismo e a educação. Os programas de sensibilização e educação ambiental envolveram mais de 5 000 participantes, incentivando a participação ativa e a responsabilidade ambiental da população.

A criação do Centro de Interpretação do Rio (C-RIO) na cidade, nas margens do rio Águeda, e a Exposição LIFE Águeda no Fluviário de Mora, garantem a continuidade das atividades de sensibilização e educação ambiental, assegurando a continuidade da divulgação dos resultados do projeto.

Conforme apresentado na secção 3, “Conclusões e Impactos Socioeconómicos a Longo Prazo”, o LIFE Águeda constitui um modelo replicável de soluções baseadas na natureza, integrando a promoção da conservação da biodiversidade com a resiliência socioeconómica, e contribuindo para os objetivos da Estratégia de Biodiversidade da UE, da Diretiva-Quadro da Água e da Lei do Restauro da Natureza. O projeto confirma que investir na natureza é investir no desenvolvimento sustentável e na qualidade de vida das populações.

SUMMARY

The LIFE Águeda project (LIFE16 ENV/PT/000411), implemented in the municipality of Águeda (Portugal), has demonstrated how ecological restoration and sustainable river management can generate visible social, economic, and environmental benefits. Through the recovery of river continuity, rehabilitation of riparian habitats, and promotion of biodiversity, the project has strengthened the link between ecosystem health and community well-being.

The project's actions created direct and indirect employment opportunities, stimulated the local economy, and fostered synergies with regional activities, including fisheries, tourism, and education. Its extensive environmental awareness and educational programmes reached over 5 000 participants, promoting environmental responsibility and participation across schools, local entities, and the wider community.

The development and establishment of the Centro de Interpretação do Rio (C-RIO) in Águeda, accompanying the riverbanks in the city, and the LIFE Águeda Exhibition at the Fluviário de Mora will ensure the continuity of outreach and awareness activities, extending the project's legacy beyond its duration.

As outlined in the Conclusions and Long-Term Socioeconomic Impact section, LIFE Águeda stands as a replicable model of nature-based solutions that integrates ecological restoration and biodiversity conservation with socioeconomic resilience, directly contributing to the objectives of the EU Biodiversity Strategy, the Water Framework Directive, and the Nature Restoration Law. The project's achievements reaffirm that investing in nature is investing in sustainable development and community prosperity.

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1. INTRODUCTION

The LIFE Águeda project (LIFE16 ENV/PT/000411) is implemented in the municipality of Águeda, in the central region of Portugal (**Figure 1**).

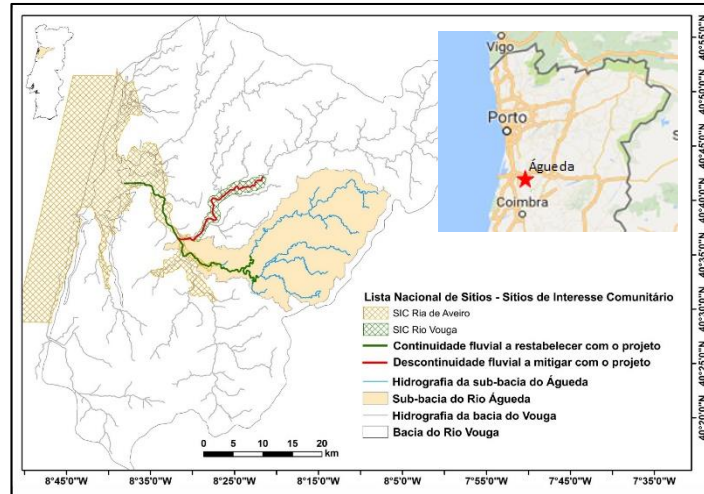


Figure 1 - LIFE Águeda's implementation area.

This area is characterized by a dynamic combination of natural and anthropogenically modified landscapes, featuring a strong connection between its river systems, agricultural areas and industrial activities (**Figure 2**), which generates environmental challenges but also opportunities.



Figure 2 - Municipality of Águeda's landscape (*source*: Municipality of Águeda).

The project's investment in environmental restoration works brings the opportunity for transversal ecosystem services benefits, while, at the same time, creating benefits and synergies in terms of the socioeconomic framework.

The implementation of the project, encompassing both the execution of implementation actions (B) (**Figure 3**) and monitoring the project's impact (C), generated important economic and social impacts within the region. This included the creation of job opportunities, local synergies, the stimulation of local economy and training and capacity building opportunities.



Figure 3 - Implementation actions: installation of a temporary weir and fish pass in River Águeda as part of the project's restoration works (action B1).

Communication and dissemination of results (actions D) were essential tools to maximize the benefits for the territory, by promoting the project (**Figure 4**) and the region, but also by fostering public awareness to the importance of the conservation and management of diadromous species, of recovering river continuity and riparian habitats within the intervention area. This outreach allowed the project to contribute to shifting local perspective towards biodiversity values, species conservation and habitat restoration, while demonstrating that these principles can be integrated with traditional uses of natural resources.



Figure 4 - LIFE Águeda's public session. CAE-Águeda, September 2023.

This report assesses the socioeconomic impacts resulting from the project's actions, demonstrating how investments in environmental protection and restoration — namely reestablishing river connectivity and the recovery of riparian habitats — can generate direct and indirect economic and social benefits at both local and regional levels.

2. INDICATORS FOR ASSESSING SOCIO-ECONOMIC IMPACT OF THE PROJECT ACTIONS

This chapter presents the indicators used to evaluate the socio-economic impacts of the implementation of the LIFE Águeda project. The assessment focuses on how the implementation actions (B1–B6), the monitoring of impacts (C), and the communication and dissemination of results (D) contributed to the region's socio-economic development.

The selected indicators allow for an evaluation of the project's impact on jobs creation, promotion of the local economy, community participation and awareness, and stakeholder engagement. They also capture the indirect benefits arising from improved ecosystem services, and sustainable use of natural resources integrated with river management and ecological restoration. The analysis can be carried out at several levels, such as (i) employment impacts, like the number of jobs created, (ii) economic impacts, e.g., increase in the procurement of goods and services, (iii) capacity building and skills development, i.e., improvement in the skills of the local workforce involved, (iii) the change in the well-being

of the population and (iv) the perception of the value of biodiversity, i.e., social impacts of environmental awareness

Together, these indicators provide a structured framework for analysing how the actions implemented under LIFE Águeda have supported the objectives of the LIFE Programme – promoting environmental conservation while contributing to sustainable socio-economic development in the intervention area.

2.1. JOBS CREATED

This **project** had impact in terms of **direct** or **indirect employment**: (i) **jobs created** and/or **maintained** during the project's execution (e.g., additional human resources in monitoring activities, technician responsible to operate the Mobile Registration Station, operation of Águeda's communication and dissemination infrastructures (**Figure 5**), (ii) days of work maintained by subcontracted entities/suppliers of goods and services (**Table 1**)



Figure 5 - River Interpretation Centre (Centro de Interpretação do Rio, C-Rio), part of the communication and dissemination actions.

The analysis of job creation associated with the project also distinguished between permanent and other staff categories, from subcontracted entities/suppliers of goods and

services, expressed in equivalent days of work, according to the surveys returned by suppliers¹.

Table 1 - Impact of the project on direct and indirect employment

Indicator group	Indicator	Unit	Value
Employment	Jobs Directly Created	(nr FTE)	5
	Jobs Directly Maintained	(nr FTE)	25
	Jobs Indirectly Created/Maintained - Qualified Staff	(nr of work days)	1143
	Jobs Indirectly Created/Maintained - Operational Staff	(nr of work days)	1362

This approach allows a clearer understanding of how project activities contributed to employment across different levels of specialization and responsibility. The graphics below (**Figure 6**) illustrate the distribution of work effort among management, technical, non-specialized, and other staff types engaged.

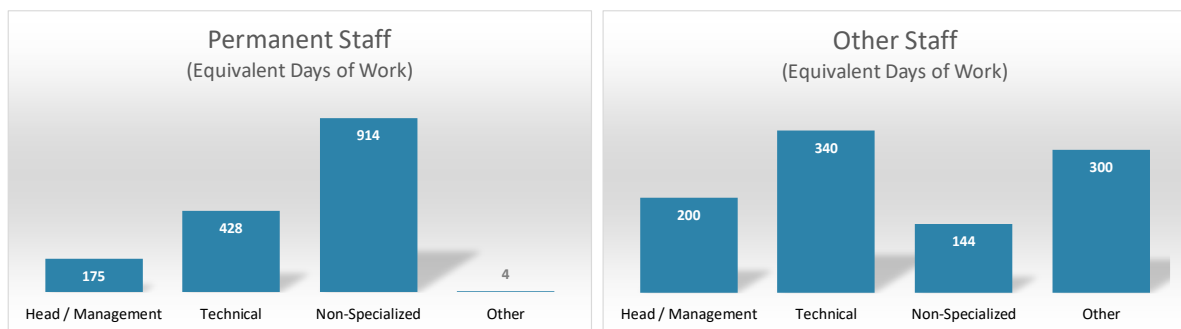


Figure 6 - Distribution of equivalent workdays by staff category, showing contributions from permanent and other staff involved in the project based on supplier survey data.

2.2. ECONOMIC IMPACTS

The economic impact assessment examined how the project contributed to the local and regional economy through both direct and indirect financial effects. It considers project expenditure within the intervention area, the establishment of synergies with existing economic activities, and the development of new market opportunities (**Table 2**). Drawing on data from suppliers and project financial records, the analysis provides an integrated view of how project investments and collaborations have supported economic activity.

¹ Not all suppliers returned the survey. The data presented are based on 22 responses received.

Table 2 - Impact of the project on economy and synergies with local activities

Indicator group	Indicator	Unit	Value
LOCAL ECONOMY / SYNERGIES	Synergies with Economic Activities - Tourism	(nr agents involved)	not yet
	Synergies with Economic Activities - Recreational Fisheries	(nr agents involved)	not yet
	Synergies with Economic Activities - Artisanal Fisheries	(nr agents involved)	55
	Synergies with Economic Activities - Energy Production	(nr agents involved)	2
	Synergies with Economic Activities - Public Water Supply	(nr agents involved)	1
	Synergies with Economic Activities - Fish Sale	(nr agents involved)	2
	Synergies with Economic Activities - Paper Pulp Production	(nr agents involved)	1
LOCAL ECONOMY / EXPENDITURE	Expenditure contracted in project intervention area (as reported in financial files)	€	134 299
	Expenditure contracted in project intervention area (as reported in financial files)	% of total	11
	Goods acquired in the project area (surveys)	€	7 022
	Goods acquired in the project area (surveys)	% of total Goods	3
	Services acquired in the project area (surveys)	€	127 277
	Services acquired in the project area (surveys)	% of total Services	13

The project's expenditure on goods and services generated positive economic effects across different territorial levels. Based on the data from the aforementioned surveys, the analysis highlights how the project investments were distributed across local (project area, Águeda), regional (central Portugal, "Centro"), national, EU markets and Others (e.g., USA). The graphics below (

Figure 7) illustrate the distribution of these expenditures, showing the geographical reach and economic contribution of the project's activities.



Figure 7 - Distribution of project expenditure on goods and services acquired at local, regional, national, EU markets and Others.

In addition to the expenditure analysis, a set of indicators was used to encompass both direct financial contributions and indirect synergies with regional economic sectors, providing a comprehensive overview of the project's socio-economic performance through complementary funding that allowed for the project's actions to be expanded and/or consolidated (**Table 3**). The table below summarises the main indicators applied in this assessment.

Table 3 - Indicators used to assess the project's economic impacts and synergies with local activities

Indicator group	Indicator	Unit	Value
COMPLEMENTARY FUNDING	Complementary EU funding in project intervention area leveraged by project works	€	159 406
	Complementary investment in project intervention area leveraged by project works	% of project budget	5%
	Complementary private funding in project intervention area leveraged by project works	€	333 467
	Complementary investment in project intervention area leveraged by project works	% of project budget	10%

2.3. CONTRIBUTION TO POPULATION WELL-BEING AND BIODIVERSITY VALUE PERCEPTION

Over the years, the loss on **biodiversity** and **climate change** led to the increase in the development of action plans and implementation capacity of nature-based solutions and ecological restoration. More than **80% of European habitats** (aquatic and others) present **poor ecological conditions** and 71 % of the fish fauna suffered a steep decline over the last decade, not to mention other important groups, like amphibians, pollinators, etc. These

combined situations were paramount drivers for the development and, finally, the approval of the recently passed **Nature Restoration Law** (Regulation (EU) 2024/1827).

LIFE Agueda’s actions contributed not only to this EU policy, but also to the EU Biodiversity Strategy, among others, by **improving connectivity** between habitats - restoring river continuity and riverbed naturalization, alongside with restoration of riparian galleries. These combined actions **promote** the **preservation** of **wilderness** and the protections of habitats and biodiversity, improving ecosystem services and thus, directly and indirectly, to population wellbeing and an increase in biodiversity value perception.



In what specific ways did LIFE Agueda contribute to achieving these objectives?

- ✔ **50 km of riverbank improvement**, control of invasive alien flora species (**Figure 8**) and rehabilitation of riparian habitats (**Figure 9**), all of which contribute to the **enhancement of ecosystem services**;



Figure 8 - Control of *Acacia dealbata* through bark removal. From left to right: baseline situation, training, execution, and results.



Figure 9 - Restoration of riparian habitats. From left to right: control of species identification and phytosanitary status; planting of specimens; planting of native species, root opening and watering; results - alder tree (*Alnus glutinosa*).

- ✔ **34 km of river continuity** has been **restored**, which **contributes** to achieve a **good ecological status**, according to the WFD definition (**Figure 10**).

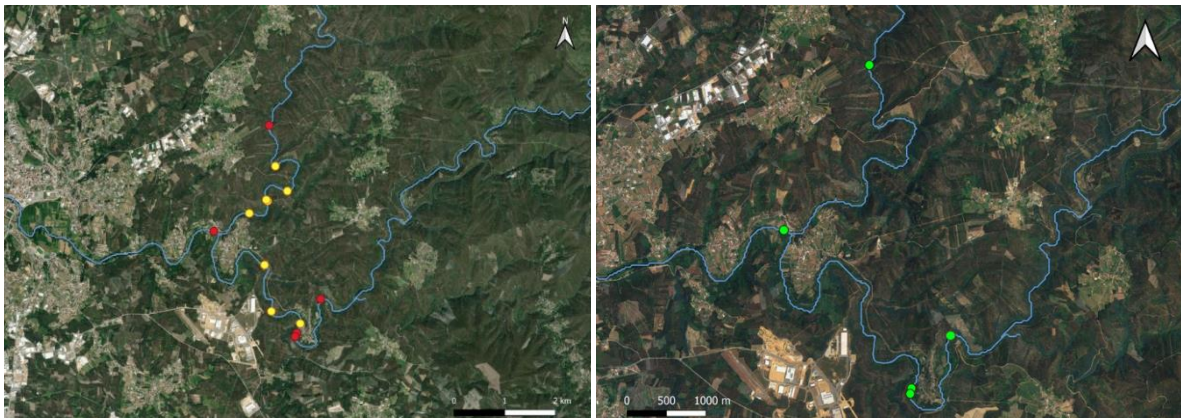


Figure 10 - Before (left) and after (right) the reestablishment of river connectivity actions. Red circles - obstacles that could not be removed; yellow circles - obstacles to remove; green circles - fish passages location.

- ✔ The collection (Eel capture station in the River Vouga, **Figure 11**) and **translocation** of **European eel juveniles**, alongside the above measures, will benefit this migratory fish species, by avoiding its accumulation downstream an unsurmountable obstacle, that would lead to a sex ratio bias, and releasing them in the recently restored areas in River Águeda

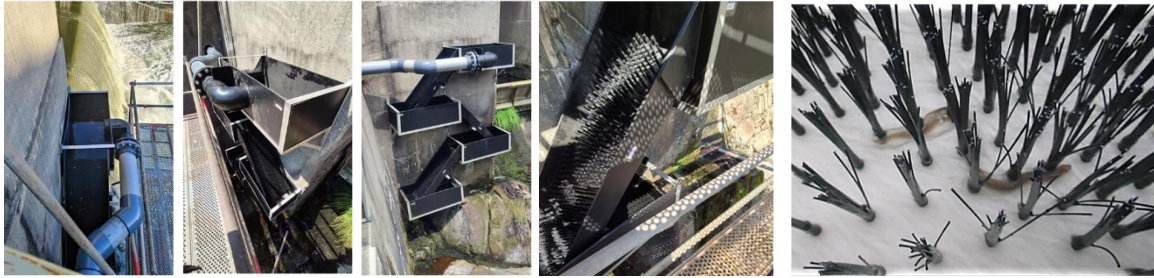


Figure 11 - Eel capture station in River Vouga, installed in the weir of a hydroelectric powerplant and respective infrastructure.

2.4. SOCIAL IMPACT AND PUBLIC AWARENESS

The project's social dimension focused on engaging local communities and raising awareness about river conservation and restoration, through public sessions, workshops, volunteering activities, and educational programmes. The project encouraged the participation of local entities, schools, and associations in these initiatives, which in turn contributed to a stronger connection between communities and the river environment, "their river", reinforcing local identity and environmental responsibility. Additionally, the actions enhanced public understanding of biodiversity values, also promoting new opportunities for recreation and nature-based tourism, which will contribute to the area's social and economic vitality.

Several environmental education and awareness initiatives were developed to convey the above message and values to all levels of society. The actions carried out, and the number of participants in each one, are presented in the next sections.

2.4.1. "O RIO VAI À ESCOLA"

"O Rio vai à Escola" activities promoted awareness of aquatic ecosystem conservation, a key objective of the LIFE Águeda project, and were led by technicians from the beneficiary partners Fluviário de Mora (CMM) and the Municipality of Águeda CMA) (

Figure 12).

The initiative reached over 1,600 primary students (1st – 4th grade) from schools across the CIRA² region – Águeda, Albergaria-a-Velha, Ílhavo, Oliveira do Bairro, Ovar, and Sever do Vouga (**Table 4**).



Figure 12 - "O Rio Vai à Escola" activities promoted by LIFE Águeda partners Fluviário de Mora (CMM) and Municipality of Águeda (CMA).

Table 4 - Number of participants, municipalities and school groups in the activity "O Rio Vai à Escola"

Year	Participants	Municipalities	School Groups
2019	351	3	4
2020	34 *	1	1
2021	*		
2022	285	4	7
2023	504	4	9
2024	294	2	7
2025	173	1	2
TOTAL	1641		

*[interrupted – COVID-19]

2.4.2. “RIO DE TODOS” AND “O MEU RIO”

The activities “Rio de Todos” and “O Meu Rio”, developed within the LIFE Águeda project, aimed to strengthen the connection between students and river ecosystems through participatory learning. “Rio de Todos” focused on classroom sessions and practical

² Comunidade Intermunicipal da Região de Aveiro / Inter-municipal Community of the Aveiro Region

workshops addressing river conservation, while “O Meu Rio” introduced a digital component through an interactive “virtual river”, allowing students to create and follow their own virtual fish. Together, these initiatives promoted environmental awareness and active engagement of **over 2 900 students** (4th and 5th grade) in the project area (**Figure 13**).



Figure 13 - "Rio de Todos" and "O Meu Rio" activities in schools of the Municipality of Águeda.

2.4.3. “LIFE EM FÉRIAS” PROGRAMME

The “LIFE em Férias” (“Life in Holidays”) initiative raised environmental awareness among children aged 6 – 14 during school holidays, as part of Águeda Municipality’s “Férias em Movimento” programme. Through interactive activities, field visits, and nature-based games, participants explored river ecosystems, native species, and conservation (**Figure 14**).



Figure 14 - "LIFE em Férias" activities promoted by the Municipality of Águeda and MARE-University of Évora.

Implemented with local partners, the programme fostered a stronger connection between young people and the Águeda River, **engaging over 2,000 children across seven editions (Table 5)**.

Table 5 - Number of participants in each edition of the "LIFE em Férias" programme

Year	Edition	Participants
2018	1st	500
2019	2nd	534
2020	³	--
2021	3rd	165
2022	4th	323
2023	5th	260
2024	6th	170
2025	7th	170
TOTAL		2122

2.4.4. ENVIRONMENTAL AWARENESS AND TRAINING

Several environmental awareness actions were carried out to enhance community participation and connection with the river ecosystem (**Figure 15**). Activities included on-

³ Interrupted due to COVID-19 pandemics.

the-ground awareness initiatives (**interpretative trails**, environmental **volunteer work** like cleaning actions, **workshops**, **inclusive adapted walking trails** to use with an E-CaR, **public sessions**, etc. These actions promoted active involvement of local communities, schools, and institutions in river conservation and sustainable management of the Águeda River basin, engaging **over 1 500 participants** throughout the project.



Figure 15 - Environmental awareness activities promoted under LIFE Águeda

2.4.5. CENTRO DE INTERPRETAÇÃO DO RIO

The **Centro de Interpretação do Rio (C-RIO)** was inaugurated on 6 June 2025 under the LIFE Águeda project (**Figure 16**). Dedicated to raising awareness on riverine ecosystem conservation, it hosts environmental education, awareness, cultural, and sports activities. With five exhibition aquariums, C-RIO offers an interactive experience showcasing the ecology, biodiversity, history, and traditions of the Águeda River. Since opening (excluding its mid-August to mid-September maintenance period), the centre has welcomed nearly **1,400 visitors** by the end of September. [More information: https://centrotorio.ageda.pt/](https://centrotorio.ageda.pt/)



Figure 16 - Centro de Interpretação do Rio (C-RIO) in downtown Águeda, by the river.

2.4.6. FLUVIÁRIO DE MORA GUIDED TOURS

Since the start of the LIFE Águeda project, guided tours at the Fluviário de Mora (Mora’s Freshwater Aquarium) have included the LIFE Águeda Exhibition (**Figure 17**), presenting fish passage scale models, videos, and information on the project’s objectives and actions. This initiative has reached **over 240 000 visitors to date**.



Figure 17 – LIFE Águeda exhibition and guided visits in the Fluviário de Mora.

3. CONCLUSIONS AND LONG-TERM SOCIOECONOMIC IMPACT

The LIFE Águeda project demonstrated that environmental restoration acted as a catalyst for local socioeconomic development. By restoring river connectivity, rehabilitating riparian habitats, and improving ecosystem services, the project delivered visible ecological results while generating social and economic benefits for the region.

Through the creation of employment opportunities, support to local suppliers, and engagement of communities, the project reinforced the link between environmental investment and regional growth. Public participation and awareness actions promoted a stronger connection between citizens and the river, fostering environmental responsibility and appreciation of biodiversity.

The establishment of permanent infrastructures, such as the Centro de Interpretação do Rio (C-RIO), and the integration of the LIFE Águeda Exhibition in the Fluviário de Mora ensure the continuation of environmental education and outreach activities beyond the project's lifetime. These resources, together with trained local stakeholders and institutional partnerships, will sustain the project's objectives and amplify its legacy.

Overall, LIFE Águeda stands as a replicable model for integrating nature-based solutions with socioeconomic resilience, while in line with the goals of the EU Biodiversity Strategy, the Water Framework Directive, and the Nature Restoration Law. Its results reinforce that investing in river ecosystem restoration contributes directly to community well-being, regional sustainability, and the long-term conservation of natural capital.



LIFE ÁGUEDA

Ações de conservação e gestão para peixes migradores na bacia hidrográfica do Vouga

LIFE16 ENV/PT/000411



Coordinating Beneficiary



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