



EUROPEAN UNION OF AQUARIUM CURATORS

REPORTING FORM

FOR CONSERVATION PROJECTS FUNDED IN 2019

1 TITLE OF PROJECT	Conservation of <i>Squalius pyrenaicus</i>, a freshwater fish endemic to the Iberian Peninsula
2 NAME OF APPLICANT INSTITUTION ADDRESS	Maria de Fátima Santos Gil Aquário Vasco da Gama Rua Direita do Dafundo, Dafundo 1495-718 Cruz Quebrada-Dafundo, Portugal
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DATE OF REPORT:	7 July 2023

PLEASE SEND YOUR REPORT TO ISABEL KOCH, SECRETARY-GENERAL OF EUAC
(ISABEL.KOCH@WILHELMA.DE)

AND COPY TO

João Falcato : jfalcato@oceanario.pt; Brian Zimmerman: bzimmerman@bzsociety.org.uk

3 LOCATION OF PROJECT (REGION & COUNTRY)

River Jamor – region: Oeiras municipality, country: Portugal

4 PROJECT START AND END DATES:

01.09.2019 to 01.09.2020 extended to 30 august 2021 due to limitations imposed by covid pandemic

5 PROJECT CO-ORDINATOR, ADDRESS AND INSTITUTIONAL AFFILIATION

(IF DIFFERENT FROM APPLICANT)

(same as applicant)

6 PROJECT TYPE

(TICK ANY COMPONENTS THAT APPLY)

- | | |
|---|--|
| <input checked="" type="checkbox"/> BIOLOGICAL/ECOLOGICAL RESEARCH | <input checked="" type="checkbox"/> EDUCATION/PUBLIC AWARENESS |
| <input type="checkbox"/> VETERINARY/CONSERVATION MEDICINE | <input type="checkbox"/> TRAINING/WORKSHOPS |
| <input type="checkbox"/> ANIMAL WELFARE | <input type="checkbox"/> COMMUNITY-BASED/SOCIAL POLICY |
| <input checked="" type="checkbox"/> CAPTIVE BREEDING | <input type="checkbox"/> ECOTOURISM/SUSTAINABLE DEVELOPMENT |
| <input checked="" type="checkbox"/> RE-INTRODUCTION/RE-STOCKING/TRANSLOCATION | <input type="checkbox"/> SUSTAINABLE USE |
| <input type="checkbox"/> HUMAN-WILDLIFE CONFLICT | <input type="checkbox"/> WARDENING/LAW ENFORCEMENT |
| | <input type="checkbox"/> PROTECTED AREAS MANAGEMENT |
| | <input type="checkbox"/> EX SITU PROJECT ONLY |
| | <input type="checkbox"/> OTHER: _____ |
-

7 FOCAL SPECIES (COMMON AND SCIENTIFIC NAME)

Iberian-chub (*Squalius pyrenaicus*)

8 IUCN RED LIST STATUS (OR OTHER THREAT LISTING) OF FOCAL SPECIES

Endangered according to the Portuguese Red Book (Cabral et al. 2005)

CITES NO

APPENDIX

9 PROJECT BACKGROUND

S. pyrenaicus is a leuciscid fish species endemic to the southern Iberian Peninsula. It inhabits both large river basins and smaller coastal rivers, with winter floods and summer droughts of variable intensity. The dry season is particularly threatening for fish, due to major habitat contraction and poorer water quality. In recent years summer droughts have become more intense and extended in time. This poses an additional extinction risk for the fish. *S. pyrenaicus* populations from smaller rivers have shown a severe decline. A population from the small river Colares was included in a project of supportive breeding for endangered endemic fish species which started in 2007 with the participation of Aquário Vasco da Gama. A captive stock founded with wild adults was reproduced under a naturalist approach. The captive bred fish were released in two different occasions in their natural population for its reinforcement. This program gathered much attention by local communities, which have been invited to participate in restocking and environmental education actions. Monitoring shows this population is no longer at immediate risk. Contrastingly, recent monitoring show that the *S. pyrenaicus* population from river Jamor, another small river from the same region, faces a strong decline and individuals with external signs of infection were found.

10 WAS THE OVERALL PROJECT PURPOSE FULFILLED?

The overall project purpose was met partially:

We increased monitoring frequency in the river.

We started a captive supportive breeding program targeting this population.

We did not recover fish summer refuges on the river but we started to work more closely with the local government (environment section), as part of our education goals and they have implemented our recommendations on replanting native aquatic vegetation.

We did not conduct restocking actions since our captive population reproduction was not successful.

We involved local authorities and the students from the local school in the *in situ* actions and conduct sessions of environmental awareness to prepare the students to be our local allies.

The project was a great opportunity to educate the local population and to involve local authorities, namely the Oeiras municipality and its technical staff. The contacts initiated then and the posterior interactions were the start for more conservation and education actions *in situ*, in local schools and at the Aquarium, joining local students, local government (environment section) and the Aquarium.

11 WHAT OBJECTIVES WERE MET?

1. Monitor and characterize fish distribution and densities along the river, **before** restocking actions;

4. Invest in the environmental education of local students through hands-on conservation activities in the wild and in Aquário Vasco da Gama (AVG) facilities.

5. Involve local authorities **to increase awareness** for the importance of summer refuges recovery and maintenance.

WHAT OBJECTIVES WERE NOT MET?

1. Monitor and characterize fish distribution and densities along the river, **after** restocking actions;

2. Identify the infection agents present in fish lesions;

3. Raise and release a generation of captive bred fish;

5. Involve local authorities **in restocking actions** to increase awareness for the importance of summer refuges recovery and maintenance.

12 WHAT PROJECT ACTIVITIES WERE UNDERTAKEN?

1. MONITORING

Fish were sampled by electrofishing after the wet seasons (April and May 2019, June 2020 and May 2021). We characterized habitat conditions and population parameters. All the individuals observed were large adults.

3. SUPPORTIVE BREEDING

In April and May 2019 we started a captive population of *S. pyrenaicus* with 23 individuals from river Jamor, using the naturalistic approach previously developed under the Conservation Program of *S. pyrenaicus* from river Colares (see Sousa Santos et al, 2014). This population was reinforced in June 2020 with more 9 individuals after the early spring census 2020 showed no successful reproduction had occurred in 2019.

Since 2020 we kept these 32 wild individuals, evaluating the stock every early spring. In 2022 spring larvae were observed but the census conducted in 2023 showed that no juveniles were present. In the spring of 2022 and 2023 researchers from MARE and CCMAR I&D centres tried to evaluate sperm viability, but males had no sperm. We hypothesized that the wild individuals used to fund this captive stock were either too old or their reproductive viability was eventually negatively affected by environmental conditions (females and males may be infertile due to pollutants, for instance, as already reported for other fish species elsewhere).

4. ENVIRONMENTAL EDUCATION

Several activities were conducted along these two years (and in the subsequent years):

- “clean-up the river” and conservation awareness workshop day, with the participation of the local students, to introduce them to the project (October 2019);
- visit of local students to the captive breeding facility and participation in an atelier on the biology and conservation of *S. pyrenaicus* (January 2020);
- hands-on activities for students in the field during monitoring (May 2021);

Production of educational material to support the workshop and atelier activities and to be offered to the local schools or to the students:

- papier maché models of the fish species with an aquatic plant and eggs;
- colouring books with local aquatic species and colour pencils;
- a field guide poster and a poster about the Jamor river habitat and the Iberian chub;
- a set of stamps featuring several aquatic species;
- paper diorama of a Portuguese river ecosystem;
- illustrated children’s book on the role of students and local communities in native species and local river conservation.

5. INCREASE LOCAL AUTHORITIES AWARENESS

Project details and activities were disseminated in social media.

Local government (environment section) was invited to participate in field activities with local schools then and in the in subsequent years since then.

13 WHAT OUTCOMES WERE ACHIEVED DURING THE COURSE OF THE PROJECT? IF THIS WAS AN EX SITU PROJECT ONLY, WHAT WERE THE BENEFITS TO THE SPECIES EX SITU AND IN SITU?

The outcomes achieved were communicated to the national conservation authorities in the annual reports of 2019, 2020 and 2021, referring to conservation, scientific and education activities, to EUAC in the 26th August 2021 webinar.

1. MONITORING

The results obtained in 2019, 2020 and 2021 showed absence of this species in two of the three sampling points where could be found previously. The total of 32 individuals found in one sampling point in three different occasions where all large adults. The absence of juveniles and young adults seems to indicate the lack of success during the last reproduction seasons and eventually a recruitment problem in this wild population.

These data reinforce the need to proceed with the *ex-situ* conservation program.

2. INFECTION AGENTS IDENTIFICATION

Contacts were made with a microbiology Professor of Lisbon University for the identification of infection agents in the captured individuals.

3. SUPPORTIVE BREEDING AND RESTOCKING

A captive population of a group of 32 adults (males and females) of the Iberian chub was established.

4. ENVIRONMENTAL EDUCATION

The activities conduction with students in local schools were made using the educational materials produced in this project (see nº12) and established the start of a wider program with local schools, with the participant classes developing activities on the biodiversity and conservation of local river ecosystems in three occasions during the school year: at school, at the Aquarium and *in situ*, by the river. This program also involves the Aquarium education and aquarist departments and the participation and support of local government authorities.

The school children produced drawings and written statements (and even performed a song!) to report their understanding of the river ecosystem characteristics and conservation.

5. INCREASE LOCAL AUTHORITIES AWARENESS

Posts of the activities developed by the Aquarium under the scope of this project were produced for Instagram and Facebook and local authorities were involved in educational *in situ* activities developed by the Aquarium. Since then, the collaboration with the local authorities for the conservation of local aquatic species increased and they reported to us their intervention on stopping the illegal capture of water from summer refuges and their efforts on planting and recovering aquatic native vegetation. They also called us to intervene when a group of fish was endangered due to drought in 2022.

ARE ANY ONGOING? SUPPORTIVE BREEDING AND RESTOCKING. On the advice of the project scientific responsible, Dr. Carla Sousa Santos (MAR-ISPA), we are still keeping the Iberian chub stock, on the hope of obtaining a captive generation for restocking the river. INCREASE LOCAL AUTHORITIES AWARENESS. In the last years, 2022 and 2023, the recurring situation of extreme summer drought reduced to a minimum the level of water in river Jamor's summer refuges, compromising the survival of local endemic endangered fish species and in 2022 we were called by local authorities to save the fish from some of the drying refuges, transporting them to the Aquarium and keeping them until the levels of water returned to normal. ENVIRONMENTAL EDUCATION. The education program started in 2019/20 and 2020/21 has been reproduced in its evolved version in 2021/22 and 2022/23 school years.

DID ANY EXPECTED OUTCOMES FAIL?

Yes: SUPPORTIVE BREEDING AND RESTOCKING and INFECTION AGENTS IDENTIFICATION

The captive reproduction of the Iberian chub from river Jamor and, as a consequence, the subsequent restocking of this species in the wild failed: although we implemented the already established naturalistic method used with this same species from another local river, we were not successful this time. The wild fish captured were much larger than the ones we kept previously and probably older and less fertile. Or, alternatively, they could have been exposed to environmental conditions who impaired their fertility. The identification of infection agents on the fish capture in the river was not possible due to the impossibility of coordination between the capture of wild fish and collection of samples for analyses. The reduced wild population and the measures implemented for the control of the pandemic in 2020 and 2021 were also very detrimental.

14 DID LOCAL PEOPLE/COMMUNITIES PARTICIPATE IN THE PROJECT? IF SO, WHO WERE THEY, HOW MANY PARTICIPATED AND WILL CONTINUED CONTACT BE MADE?

Three local schools participated in the project with 60 students and 6 teachers, plus 2 biologists from the local municipality education program and 2 biologists from the local government environment section.

We had also the participation of 3 training students from local universities and 10 volunteers. Continued contact and activities have been made in 2022 and 2023 since the end of the funded project in 2021.

IF THERE WAS COLLABORATION WITH ANOTHER EUAC MEMBER OR AQUARIUM PLEASE PROVIDE DETAILS ON THE COLLABORATION.

15 DID THE GOVERNMENT OF THE HOST COUNTRY RECEIVE INFORMATION ON THE PROJECT'S RESULTS?

Yes.

A report on the wild fish captured to start a captive population was sent to the government authority responsible for the capture permit (National Authority on Conservation: Instituto Conservação da Natureza e Florestas – ICNF).

Annual reports on all the project activities and data on the captive population husbandry were sent in 2019, 2020 and 2021 to ICNF.

16 HOW DID THE RELATIONSHIP WITH OTHER NGOS WORK? WERE THERE ANY ISSUES?

. MARE-ISPA (Research Group of the ISPA-Universitary Institute) – captured the wild fish for the captive population and provided the much needed scientific support of the project. Dra. Carla Sousa Santos also participated on some of the educational activities *in situ*, helped with the permits from the environmental authorities and established the link with the local authorities.

. Quercus (National NGO for Nature Conservation) – one of the partners of the Ex-situ Conservation Program, which was in charge of the captive breeding of other endangered fish species in aquaculture facilities located in another part of the country and gave us occasional logistic support for restocking actions and participate in communication with the media, decided to terminate their part in this major Ex-situ Project due to lack of funds.

. Veterinary Faculty (University of Lisbon) – continued our collaboration with this institution, participating in a paper published in 2021 containing data collected on wild fish kept in quarantine at the Aquarium previous to this project and received the help of training students from this university.

17 TOTAL PROJECT BUDGET AND EXPENDITURE (IN EUROS)

12196.06€

**18 AMOUNT OF MATCHING FUNDS
SPENT: 3650€**

**19 AMOUNT SPENT FROM EUAC FUNDS:
8546.06€**

20 EXPENDITURE BREAKDOWN (IN EUROS)

TRAVEL	78.44
SALARIES	
ACCOMMODATION	
EQUIPMENT	4661.7
COMMUNICATION	
MISCELLANEOUS (PLEASE DETAIL)	3805.92
TOTAL	8546.06

21 PUBLICATIONS PRODUCED AS A RESULT OF THE PROJECT

Book: "Os meninos-do-rio" pp.40, ISBN: 978-989-33-0069-5, Pitta Maria, Catarina França, 2020.

Publications on social media:

WEBSITE

https://ccm.marinha.pt/pt/aquariovgama_web/multimedia_web/Paginas/e-tu-conheces-o-rio-da-tua-terra-jun21.aspx

FACEBOOK

<https://www.facebook.com/comissaoculturaldemarinha/photos/4399748410091466>

<https://www.facebook.com/comissaoculturaldemarinha/photos/4370740849658889>

<https://www.facebook.com/comissaoculturaldemarinha/posts/4110196592379984>

<https://www.facebook.com/comissaoculturaldemarinha/videos/1075470286323312/>

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<https://www.facebook.com/comissaoculturaldemarinha/posts/4303947936338181>

INSTAGRAM

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