The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Baran Yoğurtçuoğlu
Project title	Re-Introduction and Re-Inforcement of a Critically Endangered Killifish, *Aphanius transgrediens*: Challenge Against Extinction
RSG reference	16079-2
Reporting period	July 2015 – July 2016
Amount of grant	£5000
Your email address	yokbaran@gmail.com, baranyog@hacettepe.edu.tr
Date of this report	27th August 2016

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Completing the life-history studies			X	After achieving the determination of population statuses and sizes of *Aphanius transgrediens* and *Gambusia holbrooki* within the first small grant, we continued to determine other important biological properties of the species in the area. These studies resulted in determining age, growth, reproduction and feeding of each species. Accordingly, we assessed the invasion success of *Gambusia* in different springs, food interaction and habitat use of each species in the area and reproductive period of the species.
Increased awareness of fish conservation			X	We continued to keep in touch with the local authority for taking feedbacks from local people about the project. Many undergraduate students were included in the project apart from the local primary school students. This progress has widened the target group of people and accordingly the awareness of conservation.
Constructing invasive-free pond	X			Constructing an invasive-free pond that will function as a safe micro-habitat was one of the most important outcomes of the project. However, this is not fully achieved because of a combination of several factors: (i) changing of district governor for three times, (ii) unpredictable people behaviour i.e.

				not to being mentally ready, (iii) decreasing of the water level, and finally (iv) coup attempt in the country which interrupted many activities by the way leading to state emergency. Instead of constructing a pond, we put the b plan in place. We physically removed *Gambusia* from a small semi-isolated spring and made it partially ready for *Aphanius* re-introduction. Repeating removal of *Gambusia* for a few more times and for several springs can result in more effective ends.
Creating or modifying habitats alternative to invasive-free ponds			X	Sodaş (the sodium sulphate producer company) have been draining the excess water from their salt ponds via drainage canals. *Aphanius* population inhabiting at these locations have seem to take advantage of this earthen canals and have apparently increased its population size, while *Gambusia* individuals were almost eliminated most likely because of high salt content of the water discharged. Secondly, one of the springs dominated by *Gambusia* was physically cleaned out and made free from invasive species.
Professional training of participants			X	Many of the participants of the project have gained remarkable experience in the course of activities. Including undergraduate and graduate students into the project has led to consolidation of the scientific base of the project. In-situ *Gambusia* removal and fish transportation and introduction and ex-situ breeding of *Aphanius* were the most important targeted tasks which learned by many of the participants.

Publications		X		The most important outcomes of the 2 years of Rufford Small Grant Project were one PhD thesis which is about to finish and one master thesis which is going on. Beside these, one short paper, one newsletter in Freshwater Fish Specialist Group, one poster presentation, one original article in J. Biological and Environmental Science, one oral presentation in a national congress and several local media publications have been published. There will be several more publications after defencing of the dissertations.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

A combination of several factors have caused difficulties mostly about the construction of *Gambusia*-free pond. These were for example: (i) changing of district governor for three times. District governors are important authorities in terms of keeping the issues on track, since they are the local representatives of the government and nearly all permissions are controlled and all activities are achieved by courtesy and help of this chair. When the governors are changed, the links should also have reconstructed and this costs some time loss, (ii) Unpredictable public behaviour i.e. not to being mentally ready. Despite the fact that about 500 elementary students were educated and somewhat trained, older age groups stayed out of environmental education because of time and money constraints. This resulted in keeping negative behaviour going. Thus, we thought not to try construct an open-public pond for now, which is almost certain to be got damaged, (iii) Unpredictable decrease in water level is another constraint against constructing a permanent pond, and (iv) coup attempt in the country has interrupted particularly recent activities through ending up with three-months state emergency, which in turn made many permissions invalid and cancelled existing leaves. Despite all, we enabled other plans which can serve as effective as the former plan. One was an unforeseen progress that fortunately worked almost as good as a *Gambusia*-free pond. Sodaş (the sodium sulphate producer company) have been draining the excess water from their salt ponds via drainage canals. *Aphanius* population inhabiting at these locations have seem to take advantage of this earthen canals and have apparently increased its population size, while *Gambusia* individuals were almost eliminated most likely because of high salt content of the water discharged.

We talked to the company's field supervisor for not to make any drastic change at these channels and we asked them to stay in touch with us in any case of negation. Secondly, after a detailed assessment on the ecological and hydrological properties of springs, we decided to clean one of them from invasive species (i.e. *Gambusia holbrooki* and *Carassius gibelio*). This activity made with approximately 25 volunteers (mostly undergraduate students) from different departments of Hacettepe University. After repeated at least twice cleaning process, this spring is planned to be introduced by *Aphanius transgrediens*. Further similar activities will be practised in other several springs and will be repeated in accordance with the re-colonization rate of the *Gambusia holbrooki*.

3. Briefly describe the three most important outcomes of your project.

Firstly, we revealed almost all biological properties of both species including the level of competition between species in the area. These studies yielded a PhD thesis written by the project manager. On the other hand, determining sodium sulphate tolerance of *Gambusia* and *Aphanius* is important for further potential invasive removal methods. In this context, an ongoing master thesis about salt tolerance of the species is another outcome of the project.

Secondly, we presented our fish introduction experiences in a national symposium about fish introduction and reservoir management. Our Rufford project and principles of fish introductions in terms of conservation were released to many groups and communities.

Finally, a well-trained permanent volunteer group including undergraduate and graduate students was constituted. This group is ready for progressing and further activities about *Gambusia* removal, fish introduction and environmental education programmes.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

When we noticed that our acquirements achieved in the first project have been gone down in time, because of some individual cases, we decided to inform local authorities by a meeting about taking care of environmental health. These were not to pump excess water from the springs, not to pollute habitats and not to give damage to the signboards we established in the area. We persuaded them that if they pay attention of these problems, they will be benefitted from the project in long term.

Secondly, we kept good relations with Sodaş (the sodium sulphate producer company) and they facilitated some of our field studies which carried out in their private area. In this way, they benefitted from the project by becoming known as "environment-friendly" company.

For the next stage, we are planning to involve local non-governmental organisations especially for widening the audience.

5. Are there any plans to continue this work?

We planned this project to be completed at least within 24 months from the very beginning of our first Rufford Small Grant project. Most of our efforts have succeeded and produced a promising picture. In this context, we decided not to leave alone these gains and initiated another small project which will contribute to understand the population genetics of *Aphanius transgrediens*. However, this is a pure scientific project which will not serve the purpose of conservation alone without social foundation. In short, absolutely we plan to continue the project with the involvement of trained volunteers, local NGOs and other local communities. We are ready to continue to conserve *Aphanius transgrediens* for future generations and extend the project over other endangered *Aphanius* species inhabiting close lakes, if we can be awarded a booster grant by the RSGF. Finally, we carried out a questionnaire study with random people including trained volunteers and locals about the existing results and the fate of the project. The results are summarised in the detailed report.

6. How do you plan to share the results of your work with others?

We have already shared some of our results in related national symposiums. The publications that will be reproduced from the dissertation written by the project manager is another way of conveying the results. We are also working closely with Hacettepe University and will share our summarised final report and some activities in the public relations website of the university. Finally, we will attend to The Rufford Small Grants Recipients Conference which will held in May 2017, in Turkey. Finally, a website shall be set up soon.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

The grant was used over a period of 1 year covering the time between 2015 July and 2016 July. The anticipated length for the whole project was 12 months, however, it took 13 months to be completed. The delay caused mostly due to the

coup attempt prevailed in the country. We have still some money saved for environmental education which is planned to be held after state emergency.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Transportation (Fuel and Car Rental)	900	1044	-144	This difference caused from the raising in the price of the fuel (the fuel rates are adjusted according to foreign currency, USD)
Equipment	600	435	+165	Many of our old equipment is still functioning. The difference was transferred to other items.
Accommodation	600	1050	-450	The difference was caused from accommodation cost of additional volunteers
Mapping	400	258	+142	The difference was transferred to other items.
T-shirt and Notebook	800	800	-	Fit
Environmental Education	600	100	+500	The difference was saved.
Field Training	600	721	-121	The difference was transferred to other items.
Undergraduate students	500	300	+200	The difference was transferred to other items.
Total	**5000**	**4708**	**+292**	The difference was saved for environmental education that shall be held after state emergency.

9. Looking ahead, what do you feel are the important next steps?

- One of the most important difficulties we faced during the second small grant was negative behaviours (e.g. polluting habitats, damaging signboards etc.) exhibited by a few local people. Thus, one of the most important next steps is to widening education through nearby cities.
- *Gambusia* removal is seem to be very effective in particular springs. Regular *Gambusia* removal and *Aphanius* introduction and a long-term monitoring program should be put into practice. The more success we have, the more difficult things we do, with the more eager volunteers.
- Transporting fish from invaded spring to cleaned ones may serve the purpose of saving *Aphanius* for now. However, establishing a stock of *Aphanius transgrediens* for further reintroductions is still important but should not be done without caring. Population genetics studies hereby become apparent.
- Changing in the water level of the lake may interconnect some of the springs thus *Gambusia* removal efforts can be wasted. For this reason, hydrogeological modelling of the water regime for the whole catchment area is also important in terms of availability of the springs for re-introduction.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

The Rufford Foundation Logo was of course used in all environmental education documents and field training equipment (e.g. T-shirt, notebook, certificate, questionnaire form etc.). In addition, we used RSGF logo in all of the national and international presentations.

11. Any other comments?

We would like to express our gratitude to every source provider and every stuff of Rufford Small Grant Foundation for the approval and financially supporting of the project, and in particular to Jane Raymond for understanding and support almost in all issues. Secondly, we would like to express our sincere thanks to the Hacettepe University administrative board in particular to Rector Prof. Dr. Haluk Özen and to head of Cultural Affairs Prof. Dr. Yasar Kemal Erdem for their valuable support in field training activities and for providing convenience in almost all bureaucratic attempt. Finally, we would also like to thank everyone employed in the District Governorship of Basmakçı.

Aphanius transgrediens is on the edge of extinction and there is too much things to do. We hope to continue our project with the Rufford Foundation in the near future.