# Global Re-introduction Perspectives: 2010

## Additional case-studies from around the globe

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IUCN/SSC Re-introduction Specialist Group (RSG)

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# Re-introduction of the "Extinct in the Wild" Yarqon bleak, Israel

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## Introduction

The Yarqon bleak (*Acanthobrama telavivensis* Goren, Fishelson & Trewavas, 1973), endemic to the coastal river system in Israel, is the most notable representative of Cyprinidae in this system. Until the 1950s it was distributed throughout the coastal river network, except for Kishon River (Goren *et al.*, 1973; Goren & Ortal 1999). By 1999 only three small isolated populations survived. Following the 1999 winter drought it was on the brink of extinction. In order to save it, a breeding facility was established at Tel Aviv University and ~150 fish were captured prior to complete drying of the rivers. Initial re-introduction of the fish to nature, in 2002-2003, failed. Surveys in 2003-2004 revealed its failure to reproduce in nature. It was considered critically endangered in the Israeli Red Book (Goren, 2004) and "Extinct in the Wild" by IUCN (2006). Additional research (laboratory and artificial engineered pond fed from the Yarqon River), provided knowledge enabling proper engineering of natural and semi-natural sites. During 2006-2007, ~9,000 laboratory-born fish were introduced to 12 sites, mostly engineered. Surveys in 2007-2009 revealed juveniles at most sites. The "Extinct in the Wild" Yarqon bleak has been successfully returned to nature.

## Goals

- Goal 1: To save and re-introduce the "Extinct in the Wild" Yarqon bleak to nature.
- Goal 2: To acquire the essential scientific knowledge for a successful return of the Yarqon bleak to nature and to secure its long-term survival in nature.
- Goal 3: To rehabilitate and engineer the disturbed habitat to suit the needs of the Yarqon bleak.

## Success Indicators

- Indicator 1: Breeding of released individuals.
- Indicator 2: Persistence over three generations.

First generation wild fish captured in 2007

**Ein Afek restored habitat - before (*left*) and after (*right*)**

## Project Summary

In July 1999 we realized that the last habitats of the fish were drying up as a result of the severe drought in 1999 that had followed several years of low precipitation. At this point I approached the authorities and suggested hosting several thousand fish in my laboratory for a year or two and then returning them to nature when the drought ended. Since the catastrophe was expected to continue (this area experiences frequent droughts) we had to reach a quick decision and no feasibility study was made. Fortunately, co-operation between the Yarqon River Authority, the Nature and Park Authority, the Ministry for Protection of the Environment and my own laboratory was achieved, and within three months we managed to raise the needed funds and to build the facility for maintaining the fish in the ichthyological laboratory at Tel Aviv University. Unfortunately, by then not much was left of the habitats. We were able to capture approximately only 100 fish from Nahal Yarqon and approximately 50 fish from Nahal Tut before the streams dried out. The fish, in a very bad state of health, were brought to the ichthyological laboratory and carefully treated and housed in the facility. Since only 150 had been saved, while for re-introduction of the fish thousands were needed, we set out to breed them.

Maintenance of the breeding center was complicated and included feeding the fish with a combination of manufactured and natural food, daily monitoring of the spawning substrate, transferring the spawn and their substrate to special tanks and providing each stage of the larvae and post-larvae with different conditions and diet. Within a period of three years we had managed to produce more than 10,000 fish (of both populations). Because the Yarqon bleak is a wild fish and at that time we had very little knowledge of its biology, we faced dilemmas regarding its diet, preferred spawning substrate, temperatures, velocity of the water, photoperiod, etc. Therefore, from the first day of arrival of the fish at the lab, continuous research of various biological aspects was carried out and the subsequent implementation of the findings proved to be crucial for the success of the re-introduction. We have developed a protocol for daily procedures in handling the fish, spawns, and water quality, and have developed a special menu for each stage of the larvae and post-larval development.

Parallel to our work, the Nature and Parks Authority reached an agreement with the Government to ensure a permanent, minimum supply of high quality water for the upper part of the Yarqon River. This enabled us in 2003 to return ~5,000 adult fish to the Yarqon River. This was accompanied by a public relations campaign and educational activities. Surveys carried out in the following years revealed that the re-introduced fish had survived in nature but did not reproduce. Considering the knowledge acquired in the lab, we assumed that the reason for the failure was the absence of suitable spawning substrate and insufficient shelter sites for the juveniles. To examine this hypothesis we constructed a pond of ~400 $m^2$ and 1 m depth, of which the bottom was covered with gravel and piles of stones. In addition various plants were planted in and around the pond (*Nymphaea coerulea, Potamogeton nodosus, Cyperus longus, Cyperus corymbosus, Lythrum salicaria, Lythrum junceum, Lycopus europaeus, Juncus fontanesii, Polygonum salicifolium, Trifolium sp, Cynodon dactylon, Phyla nodiflora*). Within a few months after stocking the pond with Yarqon bleak, thousands of juveniles were observed in the pond. Following this success and the Government's assurance regarding water, 12 sites along the Israeli coastal system were assigned for re-introduction of the fish, most of them engineered. During 2006-2007 approximately 9,000, laboratory-born fish were returned to nature. Offspring of the Yarqon River captured fish were stocked in southern Israel, in or close to the Yarqon River basin, while offspring of the Tut Stream were stocked in various rivers in the central and northern coastal system, in basins where this species had existed in the 1950s. In surveys carried out in 2007-2009, juveniles were found at most sites. The various stages of the project are described in detail in Goren (2009).

## Major difficulties faced

- The almost complete lack of relevant scientific knowledge regarding the biology of the fish.
- Financial support: the budget acquired was far less than the minimum required for the project. Much of the maintenance and research was performed by volunteers.

## Major lessons learned

- There are no short cuts in saving endangered species. These kinds of projects are long-term and consume a lot of time, money, good will and broad consensus of the neighboring community.
- The efforts to save a species should be directed simultaneously to several channels:

First release of bleak to Shelf River in 2002

i. Establishment of a breeding center for the species and developing a professional maintenance protocol.
ii. Research: studying the relevant aspects of the fish biology (diet, spawning habits, water quality and velocity, shelters, preferred temperatures for various stages of reproduction, preferred habitats etc.)
iii. Public relations: In order to achieve the funds needed for the project and to secure a long-term supply of water in arid countries, the good will of the public and the decision-makers is essential.
iv. Rehabilitation and engineering of the habitat.
v. Continued monitoring of the habitat after re-introduction of the fish.
vi. A devoted leader for such a project is the key to success.

## Success of project

| **Highly Successful** | Successful | Partially Successful | Failure |
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**Reason(s) for success/failure:**

- The fish reproduced in nature over 2-3 consecutive years.
- The fish population has increased significantly since the re-introduction.
- A permanent supply of good quality water to the rivers was promised by the Government as part of a new approach called: “The right of nature to water”.

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