

GLOBAL RE-INTRODUCTION PERSPECTIVES

Re-introduction case-studies from around the globe



**Edited by
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Published by: IUCN/SSC Re-introduction Specialist Group

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Citation: Soorae, P. S. (ed.) (2008) GLOBAL RE-INTRODUCTION PERSPECTIVES: re-introduction case-studies from around the globe. IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE. viii + 284 pp.

ISBN: 978-2-8317-1113-3

Cover photo: Clockwise starting from top-left:

- Formosan salmon stream, Taiwan
- Students in Madagascar with tree seedlings
- Virgin Islands boa

Produced by: IUCN/SSC Re-introduction Specialist Group

Printed by: Abu Dhabi Printing & Publishing Co., Abu Dhabi, UAE

Downloadable from: <http://www.iucnsscrg.org> (downloads section)

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Re-introduction program of the Spanish toothcarp “Fartet” in the Valencian Region, Spain

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Introduction

The Fartet (Spanish killifish) is a small freshwater fish of the Cyprinodontidae family. In the Valencian Region (Spain), where the Fartet re-introduction program has been carried out, the range of the species currently includes coastal populations as well as some inland populations at the Vinalopó watershed, with unique genetic characteristics that make them different compared to the coastal ones. The most relevant populations among the coastal ones are those at the marshes of Peñíscola, Prat de Cabanes-Torreblanca (Castellón), Marjal dels Moros (Valencia) and the wetlands of El Hondo and Santa Pola (Alicante). These populations have experienced both isolation and reduction of their distribution range due to loss of their characteristic habitat. Inland wild populations are probably extinct, only remaining in captivity and sanctuaries. The Fartet is listed as “critically endangered” in the national endangered species act (Real Decreto 439/1990 de 30 de marzo), and so, in the regional endangered species catalogue (Decreto 32/2004) with the same category. The species is also included in annex II of the Natural Habitats directive and as “endangered” in the IUCN Red List.

Goals

- Goal 1: Guarantee the long-term persistence of the species.
- Goal 2: Expand its distribution range.



Fartet (*Aphanius iberus*)

Success Indicators

- Indicator 1: Population viability has been confirmed by the results of population monitoring.
- Indicator 2: Number of sanctuaries created, meant as expansion of the species distribution area.
- Indicator 3: Individuals produced and maintained in rearing facilities, and number of re-introduced individuals.

Project Summary

Feasibility: The species shows a high adaptability to extreme conditions. Despite it is classified as a freshwater fish, it is capable of surviving in hypersaline environments. This fact has allowed the establishment of stable populations that cannot be colonized by other alien invasive species. Basically it feeds on small aquatic invertebrates: crustaceans, insect larvae (chironomids and other dipterans, etc.) and also molluscs, although it does not reject other kinds of food. The null



Fartet habitat in Spain

economic interest of the species has somehow conditioned a social indifference. However it is usually identified with some traditional aspects of Valencian Region. The main difficulty in relation to the management and recovery of the species is, no doubt, the preservation of its habitat i.e. coastal wetlands.

implementation: After the approval in 1992 of the LIFE project “First phase of an action program for the conservation of two wetlands and the creation of a reserve network for *Valencia hispanica*” co-founded by the E.U. and the Valencian Regional Government, a series of actions addressed to the conservation of Fartet in the Valencian Region were launched, as both species belong to the same order (Cyprinodontiformes) and practically have the same biological requirements, and frequently share the same habitat. Among these actions, the establishment of a program of captive-breeding of the main populations has special relevance, as well as the re-introduction and re-enforcement of the most precarious wild populations.

In order to develop these captive-breeding tasks the facilities of the “El Palmar” fish research centre, run by the Valencian Regional Government, were arranged to meet the species requirements. Since then, more than 125,000 individuals have been raised to-date. These individuals have been employed both for re-introduction programs to re-enforce the most degraded populations, as well as for re-introductions in reserve areas specially restored for them, keeping in mind the genetic criteria of the existence of different conservation units. So, in each reserve individuals re-introduced are those belonging to nearest natural population.

Special relevance has the recovery of the populations at inland Alicante by means of re-introductions that assure the permanence of those populations. There is an agreement between Regional Environmental Authority and the council of Villena in order to develop actions aimed at improving the species situation. Also the High Vinalopó area is included among the areas of recovery of the Fartet in the recently approved action plan for this species (Decreto 9/2007, de 19 de enero).

Post-release monitoring: In relation to the results of the re-introduction and the captive-breeding program, monitoring has confirmed the stabilization of most of the natural populations. The great ability of this species to adapt to salinity changes makes it resistant to the continuous hydrologic fluctuations that the coastal wetlands of the Valencian Region are exposed to, and that cause these considerable variations in salinity. On the other hand, the recently created sanctuaries present populations that can maintain themselves autonomously, so re-introductions are not needed. This is so, mainly due to the biological characteristics of the species with a high reproduction rate, both in the wild and in captivity, thus re-introductions in new reserve areas become stable populations in relatively short periods of time.

Major difficulties faced

- **Habitat destruction:** Anthropogenic influence is a major factor in habitat loss. This is emphasized in the case of *A. iberus* by their particular location at the coastal strip of a territory exposed to an increasing process of alteration due to the high number of human activities in this area.
- **Presence of exotic fauna:** The presence of alien species such as *Gambusia affinis*, *Cyprinus carpio*, etc, both as predators or competitors, has taken its toll and caused a decrease of some well established populations.
- **Pollution:** Contamination of waters by industrial, agricultural and urban wastes is another type of habitat loss as it represents an alteration of the water quality.
- **Aquifer over-exploitation:** Leads to a lowering of the water table and consequently leads to direct habitat destruction.

Major lessons learned

- Increased knowledge of the species and complete control on the captive-breeding processes so species extinction can be avoided. Also there is no lack of genetic variability in natural populations.
- We know that protection measures applied in the natural habitat of the species are difficult to implement and that they are not included in the major protection plans of wetlands and natural parks. Only the acquisition and management of

lands or the creation of reserve areas have shown to be effective regarding habitat conservation.

- Euryhaline nature of the species allows it to survive in hypersaline environments where competing species cannot survive; therefore the protection and reclamation of these habitats should be considered as a high-priority to ensure the long-term survival of the species.

- The recent approval of the Fartet Action Plan in the Valencian Region means a significant



Searching for Fartet using dip nets

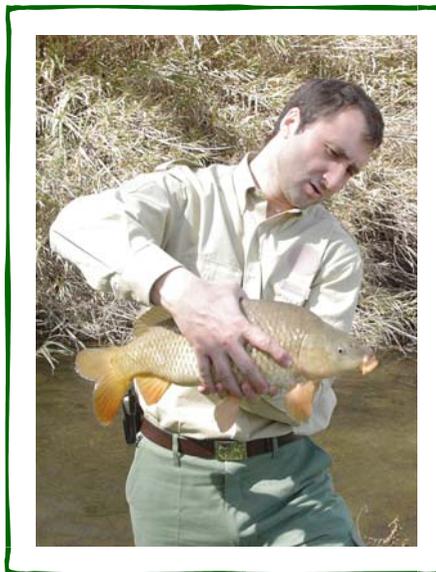
commitment by the Administration to revert the species current situation. Although there is no doubt of the increase in their numbers, effective protection of their natural habitats is essential, as the Action Plan reflects, by promoting the recovery of the wetlands of the Valencian Region.

Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

Reasons for success/failure:

- Increase in the species distribution range.
- A successful captive-breeding program.



One of the invasive species - common carp (*Cyprinus carpio*)