life STREAMS

PROTECT HABITATS AND RIVER SPECIES

Coordinated actions for the protection of habitats and river species

www.lifestreams.eu

LIFE STREAMS Project

The native Mediterranean trout (*Salmo cettii* or *Salmo macrostigma*) is one of the endemic freshwater species at greatest risk of extinction in the Mediterranean area. In fact, according to the *Habitat* Directive (92/43/EEC - Annex II), it is in a state of conservation defined as "unfavourable bad" with a declining trend.

Currently, in many areas of Italy, native trout populations are considered extinct, replaced by allochthonous populations, often of Atlantic origin.

Supplementing the *Habitats* Directive with the Water Framework Directive (DQ 2000/60/CE), which protects habitats linked to aquatic ecosystems, the **LIFE STREAMS** Project *"Salmo ceTtii REcovery Actions in Mediterranean Streams"* was founded. Its main goal is to **safeguard** the native Mediterranean trout *(Salmo cettii)* in a number of sites falling within the Natura 2000 Network, which is present in six pilot areas within Italy, through the planning and adoption **of specific and coordinated conservation action.**

The six pilot areas are located in Sardinia and in the protected areas of the Majella National Park, the Montemarcello-Magra-Vara Regional Park, the Casentinesi Forests National Park, Monte Falterona and Campigna, the Monti Sibillini National Park and the Pollino National Park.

Furthermore, the project aims to develop a wide-ranging global strategy to recover and improve the conservation status of *Salmo cettii* not only in the project-related areas, but also in the so-called "transfer areas", present both in Italy and in other European protected areas.

Specific objectives

Besides the main goals, LIFE STREAMS project also aims to:

- Develop and test a **set of conservation strategies** to restore the original *Salmo cettii* genotype by eliminating introgression sources, the eradication of alien species also through selective fishing and the introduction of pure fry raised in hatcheries designated to supporting native populations.

- Design and apply an **integrated monitoring system** to control and improve the quality of water and habitats with the application of a Minimum Vital Flow (MVF), thus reducing fragmentation throughout the river basins, in accordance with the Water Framework Directive 2000/60/EC on the protection and management of water resources.

- Define the **"Guidelines for the conservation and management of the native Mediterranean trout"** so that they become the main reference tool for the conservation actions of the entire species.

- Develop an effective strategy to **combat the phenomenon of illegal restocking** based on raising awareness and involving stakeholders, on increasing the territorial control system and regulatory and legislative instruments.

Critical issues for the conservation of the species

The native trout *Salmo cettii* is at high risk of extinction due to severe anthropogenic pressures and threats:

- habitat alterations, linked to numerous factors such as ongoing global climate change, water pollution, the fragmentation of water basins due to dams and other barriers, but also the reduction of river flows due to excessive water collection;
- uncontrolled fishing and poaching;
- lack of a widespread and shared strategy to incisively counter the genetic pollution caused by illegal introduction of allochthonous trout, often of North Atlantic origin.

Actions

LIFE STREAMS project aims to implement multiple interventions to achieve its goals:

- production of an operational protocol for the environmental characterisation of the river basins involved in the project;
- collection of data for the genetic and demographic assessment of *S. cettii* populations;
- identification of the populations of genetically pure *S. cettii* to be used as breeding stock and sites in which to conduct breeding and reproduction;
- identification of sites with genetically compromised trout populations targeted for selective fishing, eradication and subsequent reintroduction of fry.

The reintroduction and repopulation will be done with genetically suitable Mediterranean trout, the result of a careful genetic selection of breeding stock. Additional strategies will be applied in certain sites, such as the direct introduction of pure specimens from their sites of origin, selective fishing carried out by carefully selected and trained fishermen and restocking with artificially reared fry from the same basin.

The ecological status of the fluvial environments and the environmental quality will be improved with the removal of both physical barriers (dams, check dams) and hydraulic restrictions (MVF regulation), thus enabling fish fauna to rise and migrate.

Furthermore, starting from the results obtained in the pilot areas, the National Guidelines for the management of *S. cettii* will be prepared in accordance with the European Directives on biodiversity and integrated waters, which will be applied in the protected areas directly and indirectly involved in the implementation of conservation measures.

Finally, to contrast the phenomenon of illegal restocking with alien trout, territorial control and on-call guard services will be strengthened on a voluntary basis, events and workshops will be organised to increase awareness on the associated risks and the regulations will be constantly updated to create an effective system of detention and offence classification.

Key expected outcomes

In addition to the increase in the average abundance and quality of the structure by age of the populations of native trout *S. cettii*, the main expected project results are:

At least
3,000
people sensitised to the problem of illegal introductions

Identification and protection of at least
11
genetically pure native trout populations

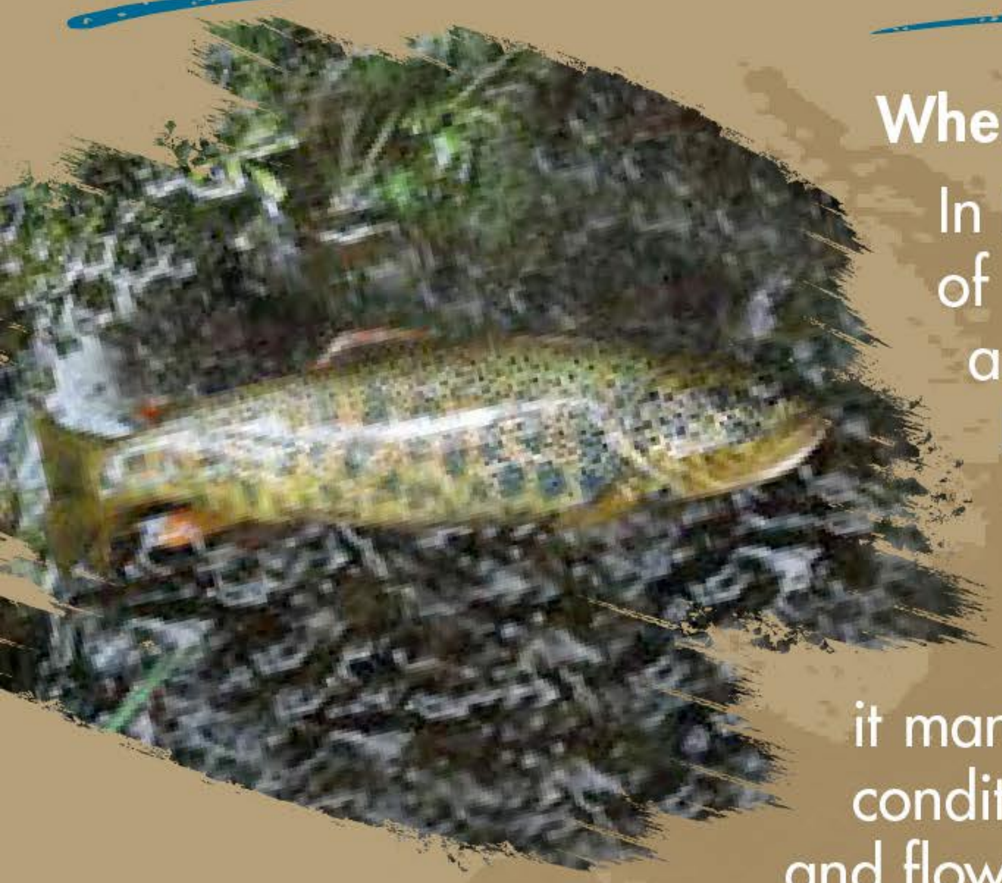
At least
51
sites with guaranteed MVF

Creation of at least
11
further pure populations

Increase of at least
5%
of the autochthonous genotype

Reduction of at least
5%
of the allochthonous genotype

The autochthonous Mediterranean trout



Where trout live

In Italy, the *Salmo cettii* species is found in the upper reaches of the Apennine insular and peninsular water catchment areas and in the mountain streams of the western Alps. In general, the native Mediterranean trout prefers clear and moderately running waters, with temperatures between 10 and 17 °C, with a pebbly and gravelly bottom and with a good presence of macrophytic flora. In reality, it manages to survive and reproduce even in less than optimal conditions, such as for example in streams with limited length and flow and in wetland areas.

What trout eat

The diet of the native trout consists mainly of larvae and adults of insects, crustaceans and – to a lesser extent – molluscs. Fry and small fish are also a valuable source of nutrition, especially for larger specimens.

Habitat

Salmo cettii is a migratory species within fresh waters which, depending on its stage of development, moves towards the most suitable ecological and functional habitat it can find: in general, as in all salmonids, the reproduction areas are upstream of those preferred for development or foraging.

Reproduction

The reproduction of *Salmo cettii* takes place in shallow and flowing waters, in a gravelly bottom that the female cleans to remove aquatic vegetation. Generally, the reproductive period is from December to January, but it can also last until March. The female lays her eggs in several batches and, once fertilised, covers them with gravel and small pebbles to protect them from predators.

Morphological characteristics of *Salmo cettii*

Recent studies have provided useful tools to morphologically distinguish Atlantic trout from Mediterranean varieties. Although **only genetic analysis can detect the extent of genetic purity,** the following characteristics distinguish *Salmo cettii* individuals from allochthonous trout:

- presence of a dark, well-defined pre-opercular spot;
- greenish-blue parr spots present along the sides, also in adults, irregularly distributed and arranged in several rows;
- fine speckling distributed on the sides with small and irregular spots devoid of white surrounding halos;
- red speckles everywhere and not only on the lateral line (with aligned spots) but also on the belly;
- relatively large head and well-developed fins.

LIFE STREAMS

PROTECT HABITATS AND RIVER SPECIES

Salmo ceTtii REcovery Actions in Mediterranean Streams

THE LIFE PROGRAMME

The LIFE Programme is a financial instrument of the European Union to support, at EU level, measures and projects for the protection of biodiversity and nature, environmental policy and to raise awareness on environmental issues.

THE NATURA 2000 NETWORK

The Natura 2000 Protected Areas Network is the main instrument of the European Union for the conservation of biodiversity. It is a network of breeding and resting sites for rare and endangered species and some rare types of protected natural habitats that extends across all EU territories, over land and sea. Natura 2000's goal is to ensure long-term survival of the most valuable and threatened species and habitats in Europe, listed in both the Birds and Habitats Directives.

LIFE18 NAT/IT/000931

Published with the contribution of the EU LIFE financial instrument.

adv: IDM Graphic :: www.idmgraphic.it

Beneficiary coordinator

Beneficiaries associated