



## CRAINat Project

Conservation and Recovery of *Austropotamobius pallipes* in Italian Natura 2000 Sites



Habitat Directive

eradication of invasive  
alien species

water habitats

improving biodiversity

renaturalisation

preservation  
techniques

### PROJECT DESCRIPTION

The CRAINat project had the main purpose of carrying out specific protection and conservation actions for the *Austropotamobius pallipes*, commonly called **crayfish**. The elements of pressure on the species with high conservation priority (as such included in the Annexes II and V of the Directive 92/43/EEC "Habitats"), are those which, singularly or combined among them, represent direct threats to the survival

of the species, in this case the spread of exotic lobsters (with consequent reduction of living spaces and spread of diseases such as



**aphanomycosis** or shrimp plague, which often leads to the death of entire populations in a short time), poaching, water pollution, transformation of the river environments, and global warming leading in the summer period to the reduction or total interruption of the rivers' water flow as well as to excessive temperatures of the water. The project was carried out by the Province of Chieti within **47 Sites of Community Importance (SCI)**, collaborating in Northern Italy with ERSAF (Regional Authority for Agriculture and Forestry Services) and the Lombardy Region, and in Central Italy with the Abruzzo Region, the Province of Isernia, the Gran Sasso Monti della Laga National Park and the Mario Negri Sud Foundation. **The habitats involved are essentially represented by the minor surface hydrographic systems within the Natura 2000 network.**

### OBJECTIVES

The main objectives were:

- conservation and recovery of the indigenous crayfish populations through interventions of wildlife reintroduction/ reinforcement (IUCN);
- creation of semi-natural experimental sites for the reproduction and housing of crayfish, called *source area*;
- river requalification by means of naturalistic engineering techniques;
- containment/ eradication of alien species;
- production of a shared and uniform regulation for the conservation of the species;
- training of territorial operators on techniques and activities for the conservation and management of the species;



- raising stakeholders' and local communities' awareness, through environmental education and information, on the importance of biodiversity and its protection.

## PROJECT PHASES

The main activity in terms of active conservation consisted of specific actions aimed at the production of juvenile specimens and their introduction, in some cases together with specimens in breeding age, into aquatic environments deemed suitable for their survival. Beyond these actions, other actions to manage other species have been carried out, such as: survey of presence and consistency of the species on the watercourses of the involved SCIs, genetic characterization, monitoring and containment of allochthonous species, maintenance and restoration of habitats.

Over 60 actions were implemented within the project, divided into 5 categories:

- **Preparatory actions** such as technical planning of the activities and design of breeding structures, development of skills and training of local operators. The project seminars on the Natura 2000 Network and protection of the crayfish (as for ecological, sanitary, conservation, etc. aspects) were composed of a theoretical and a practical part, the latter of which was held at the CRAINat reproduction centers. The **Action Plan** for the crayfish was also prepared and adopted at this stage of the project.
- **Purchase of land and/ or rights:** the lots for the creation of the source areas (natural nurseries) have been found in the Abruzzo and Molise regions. It was not necessary to purchase them as they were made available by the Municipalities of Sesamo in Molise, Rocca di Mezzo in Abruzzo and by the administration of the Municipality of Capestrano.
- **Direct conservation actions** aimed at safeguarding the crayfish (addressing the threats and promoting an increase in the present indigenous populations). They consisted notably in the activation of breeding centers, and the creation of source areas and multifunctional ponds. Task forces were created for the translocation of the populations at risk, and the juveniles obtained in the breeding centers were spread. In addition, the environmental flow suitable for the crayfish's life was determined in the identified SCIs, and anti-poaching activities as well as habitat requalification interventions were carried out.
- **Communication actions and dissemination of results** aimed at different targets (schools, citizens, associations of the sector). It included, in particular, educational - information panels, exchange of experiences, environmental education projects to transfer the results and techniques learned to all interested parties and improve the state of knowledge on the crayfish and the Natura 2000 network in general.
- **Management and monitoring:** notably the conservation actions were monitored to verify the (qualitative and quantitative) effectiveness of what was achieved during the project.

## PROJECT RESULTS

The CRAINat project contributed to the implementation and updating of breeding and monitoring techniques for crayfish populations and their conservation status. In particular, breeding systems have been created characterized by extremely simple and inexpensive management, able to ensure the health of the species. The two types, semi-natural (external ponds) and artificial (internal tanks) breeding systems, as well as the multifunctional ponds and "source areas" are easily replicable in other contexts at low costs. Both direct interventions on the crayfish (reintroduction and translocation) and interventions on their habitat have brought direct benefits to the species by increasing the number of populations and addressing the risk factors (threats).

Long-term results include the experience gained in contrasting and managing **afanomycosis**, which has occurred several times and in different territories throughout the entire project duration. If on one hand this phenomenon led to problems, on the other it allowed the development of a **prevention and intervention methodology** which has become a consolidated practice and was included in the **Action Plan**, adopted by all the project partners and disseminated to all the stakeholders of the sector.

The main results achieved by the project include:

- **creation of 7 breeding centers** with different characteristics (external ponds, internal tanks). It represented a good case study to carefully evaluate, with reference to different conditions, which structure is more suitable in terms of productivity (number of juveniles), as well as of costs and management of the centers. It has been shown that the external ponds have a much simpler and less expensive management compared to the internal tanks, since it is not necessary to constantly and carefully assess the health status of the animals which are in a semi-natural environment.
- **genetic characterization of the populations.** It has provided fundamental indications concerning the management and reintroduction of these populations. Such analysis made it possible to delineate the "Evolutionarily Significant Units".
- **evaluation of the environmental flow.** It allowed to carry out analyses on the state of conservation of the habitat on the basis of the environmental flow. The critical issues emerged during the project relating to water extractions and low



rainfalls, highlighted the need to use a management tool suitable for small streams and creeks.

- **general study and survey of the crayfish species.** It has allowed to avoid, in the SCIs in Lombardy, the taking of specimens from populations with insufficient density. While in the Central Regions in the Gran Sasso and Monti della Laga National Park, monitoring has made it possible to acquire relevant information on the distribution of the indigenous crayfish, showing also how the species goes to higher altitudes than its common ecological needs, when these environments are of suitable overall quality and rich in microhabitat refuge.
- **creation of "source areas" in the central regions and multifunctional ponds.** It was among the most **innovative** aspects of the project. The "source areas" are made up of channels in direct contact with the waterways, where the waterflow slows down and allows the development of optimal environmental conditions for the reproduction of the introduced breeding specimens and the subsequent spread of the juvenils in the adjacent waterways. These are areas where the species can also find refuge and hopefully colonize the surrounding watercourses.
- **conservation status of the crayfish improved in 8 SCIs.** It was done **by increasing the number of populations and appropriately addressing the risk factors (threats).** The environmental redevelopment actions that involved 7 watercourses in as many SCIs with interventions aimed at improving the river connectivity, produced an immediate benefit to the habitat and consequently to the species.
- **7 interventions in Lombardy and 3 in the Central Regions to redevelop and reconnect the species's habitat.** It has improved the conservation status of the habitat through, for example, the erection of protections, creation of new shading vegetation, etc..
- **training courses** held for the stakeholders and managers of the protected areas involved in the project. This allowed the **creation of intervention groups - task forces - (6 in Lombardy and 4 in the Gran Sasso and Monti della Laga National Park)** for the temporary translocation of crayfish in case of occurrence of unsuitable environmental conditions. These task forces represent a permanent and active protection capable of intervening in the project areas on the basis of a "**translocation protocol**", in case of occurrence of critical conditions for the crayfish populations.
- the **problem of afanomycosis has increased the awareness of stakeholders** about the need to modify the treating methods of the species and its habitat. For example, local health offices and sport fishing associations have become aware of the measures to be taken to avoid dangerous interferences. Furthermore, the sensitivity towards the need to combat the poaching phenomenon has increased considerably. The greater awareness of the permanent control bodies has produced direct positive effects on the protection of the species.
- the **[Action Plan for the conservation of the \*Austroptamobius pallipes\* in Italy](#)** is the main scientific document produced within the framework of the project capable of providing the competent bodies with orientations and guidelines for the correct protection of the crayfish; the studies carried out have made it possible to advance scientific knowledge about the species; for example the specific assessment regarding the minimum environmental flow for the species has favored the **development of greater skills and knowledge** by local operators, students, tourists and managing bodies. The issue of crayfish conservation and importance of biodiversity and its protection, was dealt with in **5 training seminars** in Lombardy and 28 theoretical-practical training seminars in the central regions with the involvement of 577 participants (teachers, State Forestry Corps).
- the meso-scale methodology (MesoHABSIM - **Mesohabitat Simulation Model**) for the evaluation of the minimum environmental flow suitable for the *Austroptamobius pallipes* complex species was applied for the first time within the CRAINat project. This method offers numerous advantages over the traditional methods, as it allows to simulate the variation of the habitat of the aquatic ecosystem on the basis of the environmental flow range even in cases of complex morphologies and considerable slopes; in addition, it allows the use of a wide range of environmental variables for the description of the river habitat, allowing a comprehensive biological analysis both of the species and the aquatic community. Furthermore, this model represents a useful management and control tool for the protected areas' managers. In fact, quantifying the minimum environmental flow on the basis of the environment represents an important step for the protection and management of the species and its environments.

The MesoHABSIM methodology developed within the project was used by the LIFE GESTIRE project (LIFE11 NAT/IT/00044) of the Lombardy Region, while the LIFE + TEN project (LIFE11/NAT/IT/000187) used for reference the construction model of the CRAINAT breeding centers, both for the breeding in hatchery and in outdoor ponds with semi-intensive methodology, for the reintroduction of this species in Trentino.



**Acronym**

CRAINat

**Number of reference**

LIFE08 NAT/IT/000352

**Reference Programme**

[LIFE](#)

**Beneficiary Coordinator**

Provincia di Chieti

**Contacts**

Giancarlo Moca

**EU contribution**

1.538.191

**Call Year**

2008

**Start Year**

2010

**End Year**

2014

**Beneficiary headquarters**

Corso Marrucino, 97  
 66100 Chieti CH  
 Italy

**Region**

Abruzzo

**Description**

Abruzzo, Lombardia e Molise