

Eradication of a brown trout (*Salmo trutta* Linnaeus, 1758) population in the Rosandra Stream (Friuli Venezia Giulia, Northeast Italy)

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DIPARTIMENTO DI SCIENZE DELLA VITA

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FRIULI VENEZIA GIULIA
Parchi e riserve naturali

Introduction

The Val Rosandra-Dolina Glinščice Regional Natural Reserve (Fig. 1) is located in the southeastern section of the Italian Karst region (province of Trieste, Northeast Italy) and is managed by the Municipality of San Dorligo della Valle-Občina Dolina. A typical feature is the presence of the Rosandra-Glinščica Stream, the only superficial watercourse in the Karst region.



Fig. 1. The Val Rosandra-Dolina Glinščice Regional Natural Reserve (Pictures by P. Ce).

The brown trout (*Salmo trutta* Linnaeus, 1754) (Fig. 2) is an alien species in the Rosandra Stream where was introduced for fisheries since the 1980s. It represents a source of impact for populations of *Austropotamobius pallipes* due to larvae predation and for *Phoxinus phoxinus* which is also a prey item (Figure 3). Brown trout is also a threat for amphibian species living in the Natural Reserve such as *Bufo bufo*, *Salamandra salamandra*, *Pelophylax ridibundus*, *Rana dalmatina*, *Bombina variegata* (Fig. 4).



Fig. 2. Brown trout (Picture by F. Bortolon)

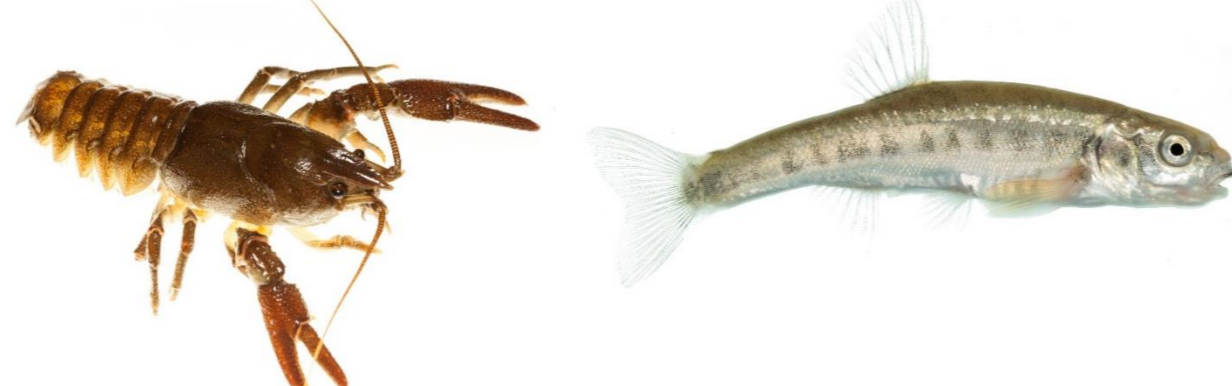


Fig. 3. *Austropotamobius pallipes* and *Phoxinus phoxinus* (Pictures by F. Bortolon).



Fig. 4. Amphibians of the he Val Rosandra-Dolina Glinščice Regional Natural Reserve (Pictures by G. Fior).

The present study shows the first results of the eradication sampling campaigns planned by the management Authority and performed during the 2018-2019 period by the ETPI (Fish protection Authority of Friuli Venezia Giulia) in collaboration with the life Science Department of the University of Trieste.

Methods

Captures were performed by electrofishing during sampling campaigns carried out in summer and autumn 2018 (Fig. 5). A control sampling was performed during summer 2019 to check for remaining population. Field operations were carried out by personnel of the ETPI (Fish Protection Authority of Friuli Venezia Giulia) and by personnel of the Life Science Department of the University of Trieste. At each sampling event, total length (cm) and weight (g) were recorded for the specimens which were then stocked in oxygenated tanks and moved to the Slizza Stream basin, where *S. trutta* is native, paying attention to specimen survival. Genetic analyses were carried out by personnel of the Life Science Department in order to confirm that *S. trutta* was the only trout species in the Rosandra stream.

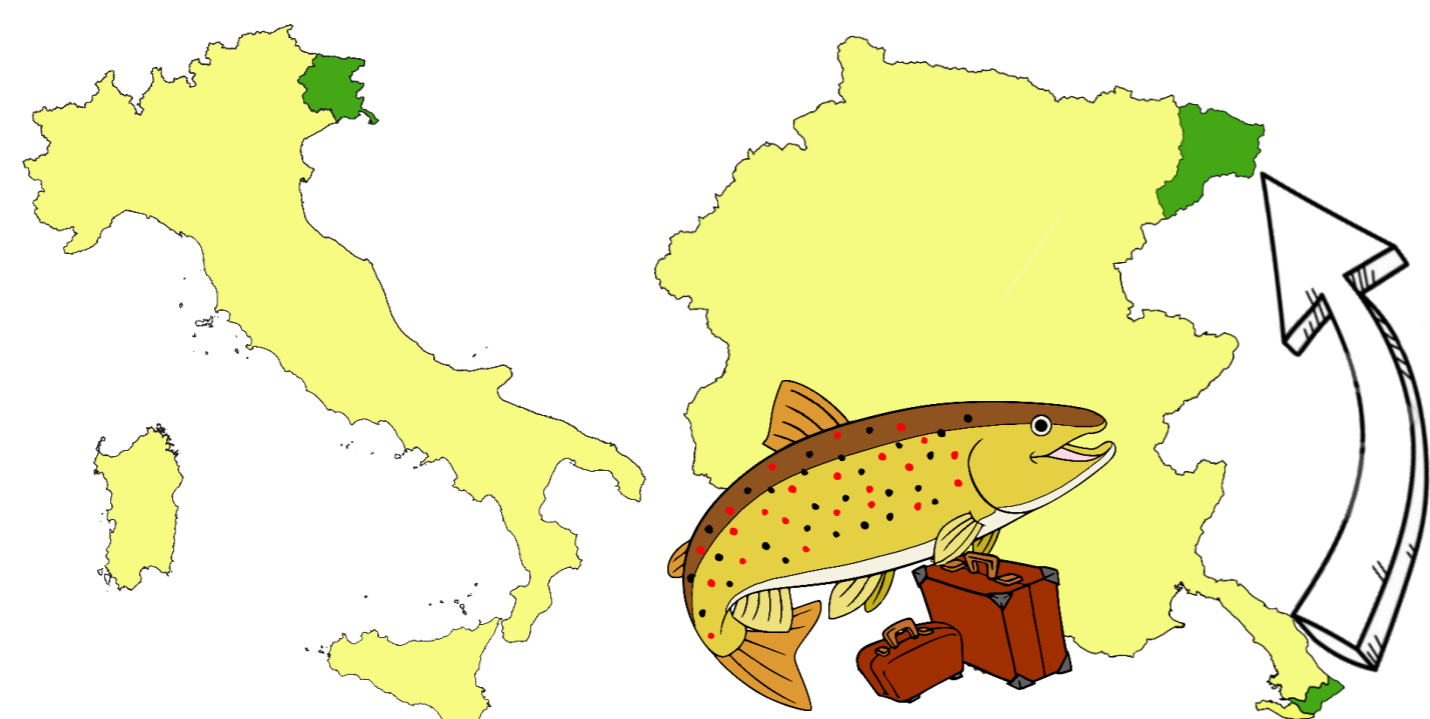


Fig. 5. Field operations and movement planned for the eradicate Rosandra brown trout population (Pictures: P. Ce)

The Italian section of the Rosandra stream was considered for sampling operations. As the watercourse is divided in two stretchese by a waterfall, upstream and downstream sections were analyzed separately (Fig. 6).



Fig. 6. Monitored stretches of the Rosandra Stream, and view from the top of the waterfall (Picture by P. Ce)

Results

Genetical analyses performed by PCR DNA and use of RFLP enzymes amplification confirmed that *S. trutta* was the only species in Rosandra Stream (Fig. 7a, b).

Samplings in 2018 allowed the collection of 157 specimens in the upstream section and 612 in the downstream section, belonging to six age classes (Fig. 8, 9). During the control sampling operations in 2019, 39 specimens were collected, five in the upstream section and 34 in the downstream (Fig. 10).

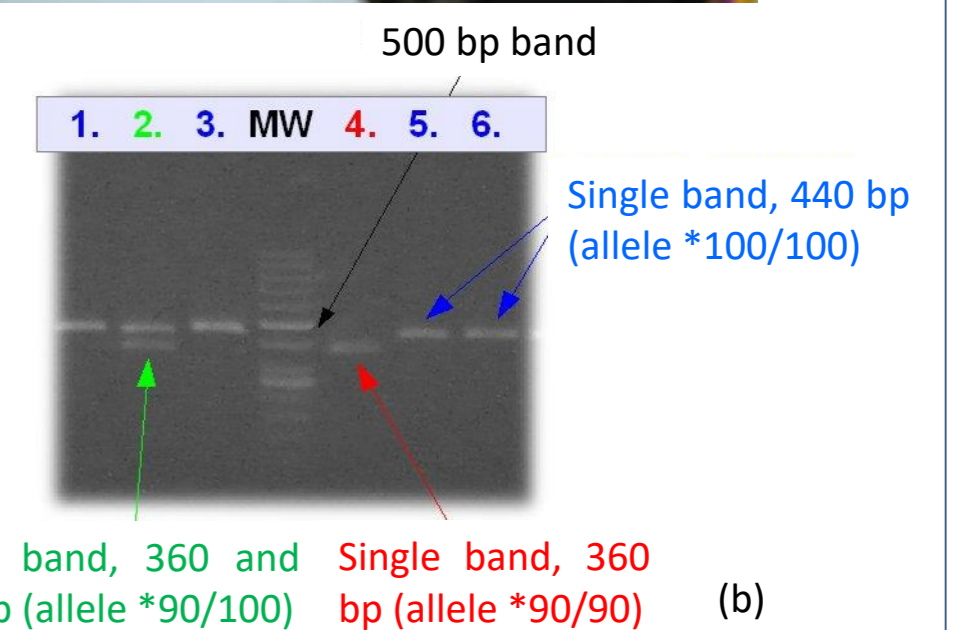
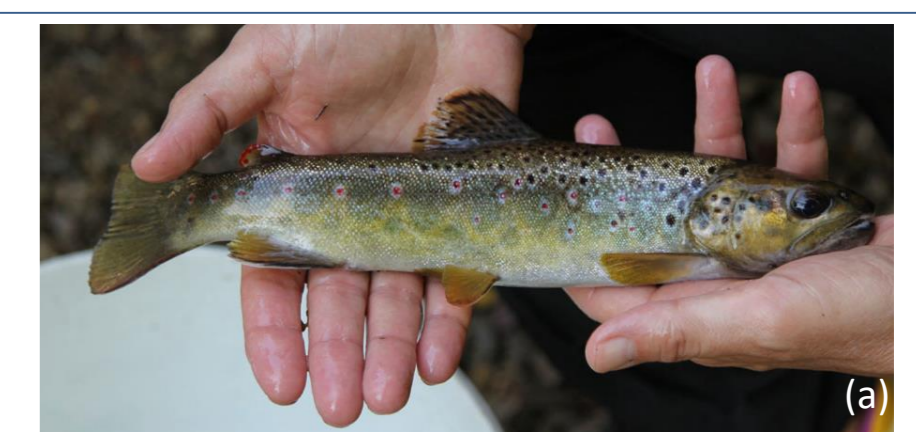


Fig. 7. Genetic analyses performed on Rosandra brown trout specimens (Pictures: a, P. Ce; b, C. Manfrin)

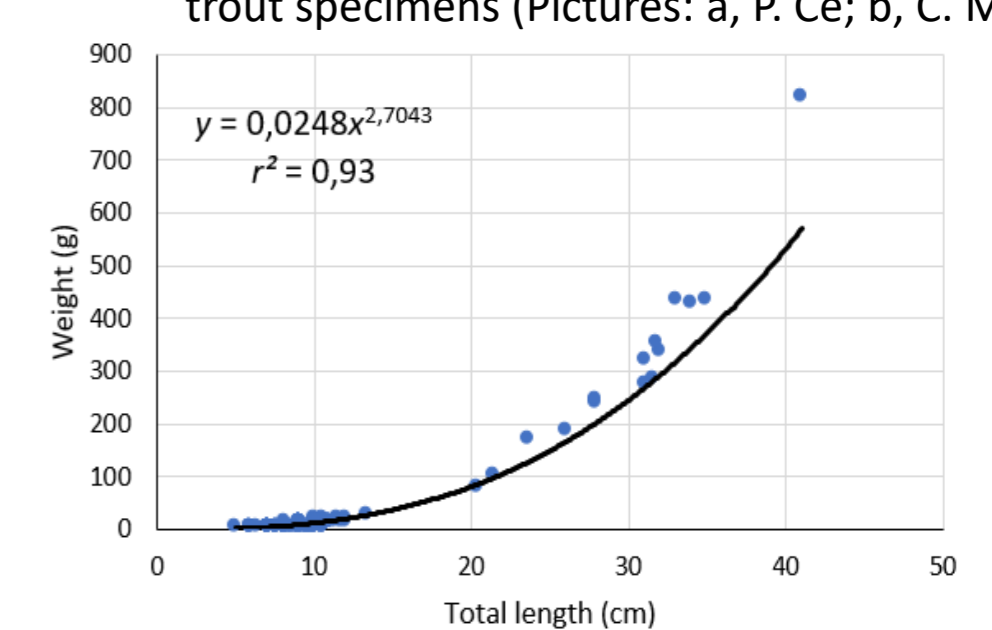
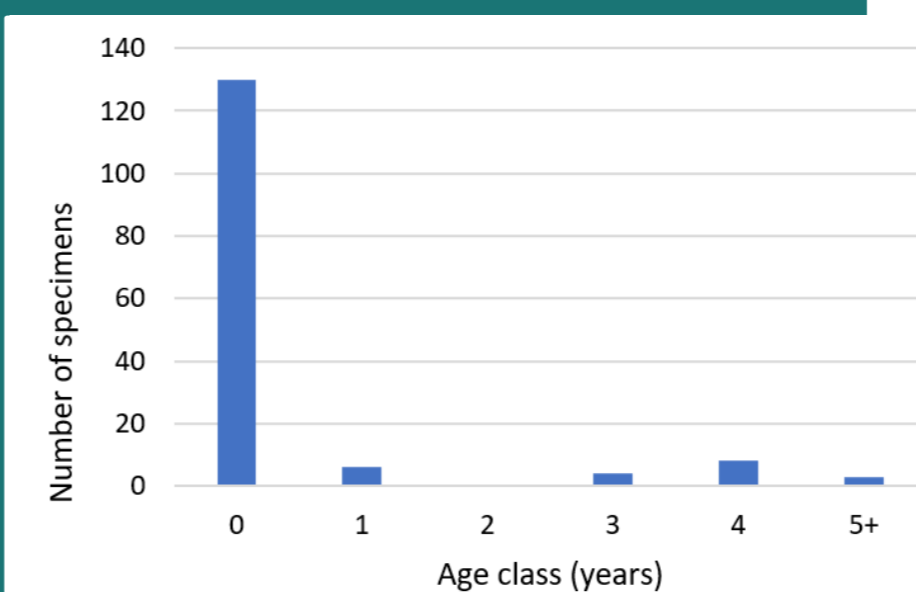


Fig. 8. Population structure and total length – weight relationship for specimen collected in the upstream stretch during 2018

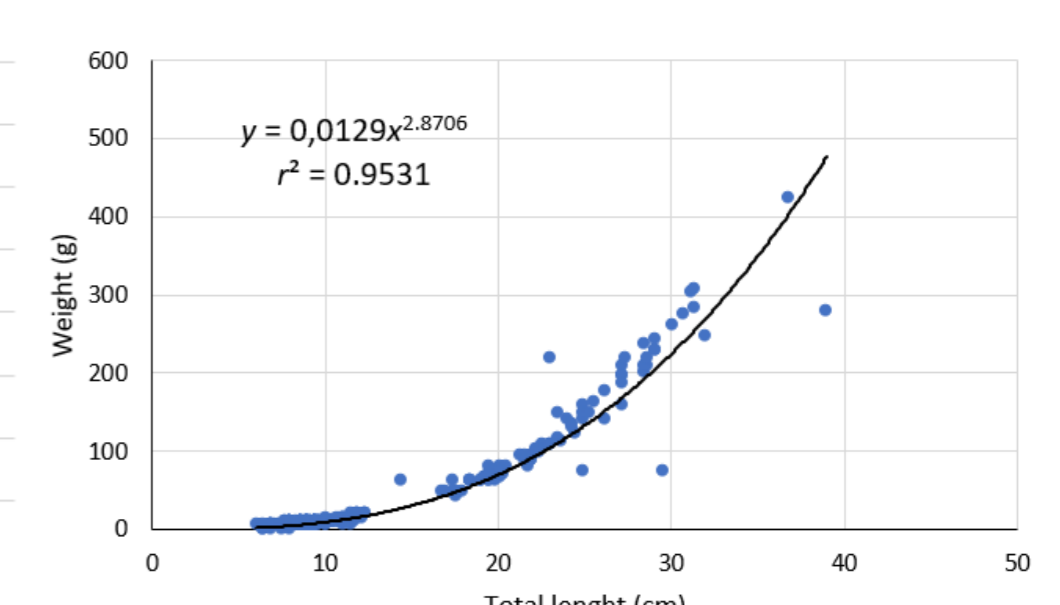
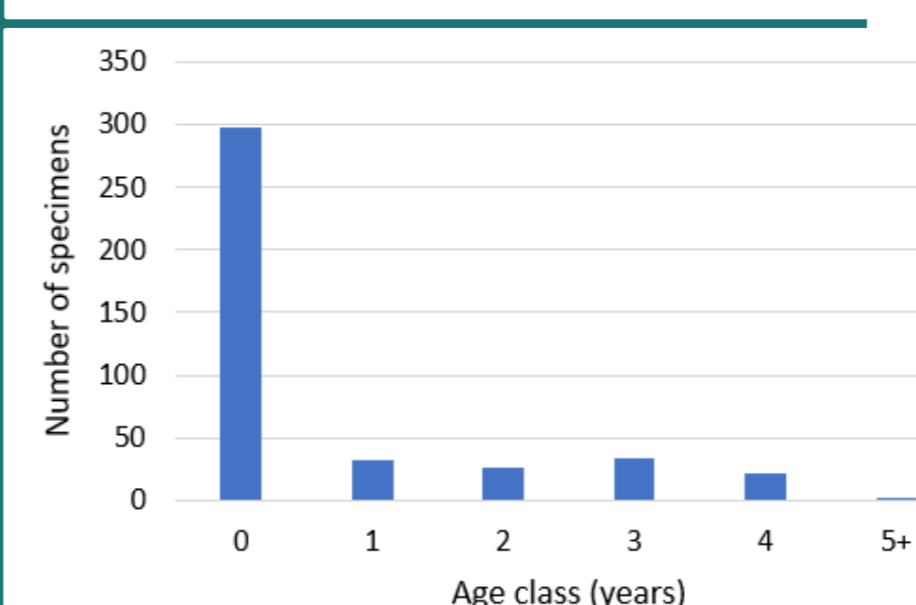


Fig.9. Population structure and total length – weight relationship for specimen collected downstream stretch during 2018

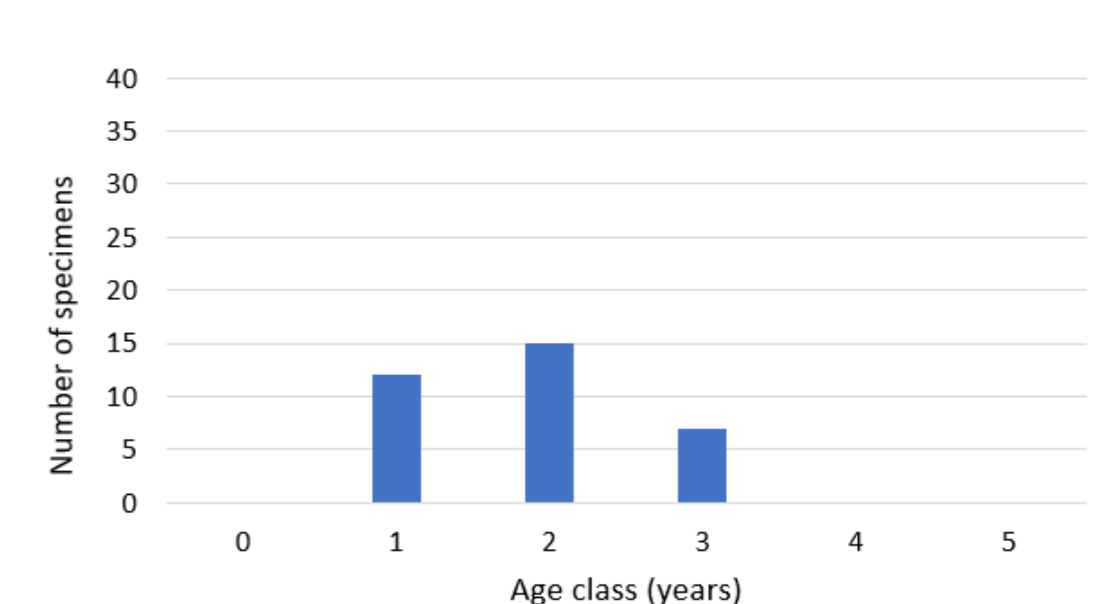
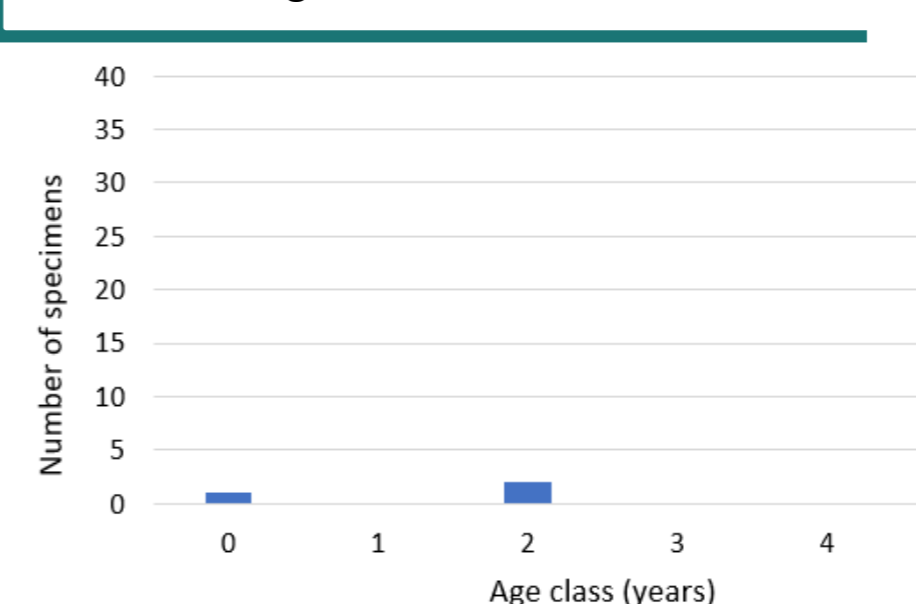


Fig. 10. Population structure obtained from data collected during the control sampling in summer 2019

Conclusions

The present study highlighted the presence of a large brown trout population within the Rosandra Stream, although it was unbalanced and not well structured, due to the higher presence of small sized specimens. This condition is related to the moderate flow velocity and to drought periods. This findings support the conclusion that the complete eradication of the brown trout from the Rosandra Stream can be achieved. However, as 39 specimens have to be found in the latter sampling operations, the eradication campaign have to continue in order to catch the remaining specimens and to verify the eradication success.