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**RESEARCH ON THE NATURAL HERITAGE OF THE
RESERVES VINCHETO DI CELARDA AND
VAL TOVANELLA
(BELLUNO PROVINCE, ITALY)**

Conservation of two protected areas in the context of a LIFE Project



Corso Forestale dello Stato
Centro Nazionale per lo Studio e la Conservazione
della Biodiversità Forestale "Bosco Fontana"
Verona

This volume of the series "Quaderni Conservazione Habitat" is the result of four years of research carried out in the nature reserves Vincheto di Celarda and Val Tovanella, in the context of the LIFE Project LIFE04NAT/IT/000190. Both areas are managed by the Italian State Forestry Service (Corpo Forestale dello Stato) and are situated in the province of Belluno. While the first reserve is located in a plain alongside the Piave River, the second reserve is a small secluded valley in the Dolomites. The book includes 33 scientific articles, a general introduction and concluding remarks and treats a wide range of subjects, covering hydrogeology, flora, vegetation, lichens, molluscs, spiders, insects, fish and birds. A number of national and international specialists were coordinated by the Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale "Bosco Fontana" of Verona and contributed to the project. This allowed to describe the biological systems of the reserves at an unprecedented level of detail. For example, a total of 21 species are for the first time reported for the Italian territory. Numerous rare and protected species were also discovered and it was thus possible to consider their ecological needs for the management of the reserves. The multitude of new faunistic and floristic data contained in this volume highlights the elevated level of biodiversity of the reserves and adds substantially to the knowledge of the natural heritage of Belluno province.

Questo volume della serie "Quaderni Conservazione Habitat" è il risultato delle ricerche svolte nell'ambito del progetto LIFE Natura LIFE04NAT/IT/000190 nelle Riserve Naturali Vincheto di Celarda e Val Tovanella, entrambe gestite dal Corpo Forestale dello Stato, Ufficio Territoriale Biodiversità di Belluno. La prima è collocata lungo il fiume Piave, mentre la seconda è una piccola valle delle Dolomiti Bellunesi. Questo libro, composto da 33 articoli scientifici, una introduzione generale e da conclusioni finali, tocca una moltitudine di argomenti, come idrologia, flora, vegetazione, licheni, molluschi, ragni, insetti, pesci e uccelli. La collaborazione di numerosi esperti, nazionali ed internazionali, coordinati dal Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale "Bosco Fontana" di Verona, ha permesso di descrivere il sistema biologico delle riserve con una accuratezza senza precedenti. Ad esempio, 21 specie sono segnalate per la prima volta nel territorio italiano e molte altre risultano rare e protette. Le loro esigenze ecologiche sono in seguito state considerate nella gestione delle riserve. La moltitudine di nuovi dati sulla fauna e flora presentati in questo libro, oltre che dare rilievo alla straordinaria biodiversità di questi territori, contribuisce in modo significativo alla conoscenza degli assetti naturalistici della provincia di Belluno.

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On the presence of a breeding population of rainbow trout (*Onchorhynchus mykiss*) in the Rio Tovanella

Paolo TURIN

ABSTRACT

The water bodies of the Val Tovanella Nature Reserve host a fish community with a low species diversity, represented by a large acclimated and breeding population of one salmonid species, the rainbow trout *Onchorhynchus mykiss*. This allocthonous species, introduced from North America, reproduces in Italy only in rare cases, and thus the population of Val Tovanella, together with a few other sites, is an exception in the biology of this species for the Alpine, and in general for the Italian waters. Other European breeding populations of rainbow trout are known from some sites in Austria, Liechtenstein, Denmark, Norway and Sweden.

Key words: Val Tovanella, *Onchorhynchus mykiss*, freshwater fish, alien species.

RIASSUNTO

Le acque della Riserva Naturale Orientata Val Tovanella ospitano un popolamento ittico povero in termini di diversità specifica e costituito da una sola specie di salmonide. Queste acque ospitano infatti un popolamento monospecifico di trota iridea, *Onchorhynchus mykiss*, che è presente con una buona popolazione acclimatata e riproduttiva. Questa specie alloctona, originaria del Nord America, solo in casi eccezionali è in grado di riprodursi naturalmente nelle nostre acque e quindi la Val Tovanella, insieme a pochi altri siti noti, costituisce una eccezione nella biologia di questa specie nelle acque alpine e più in generale in quelle italiane. Altri casi di riproduzione in natura della trota iridea sono noti per l'Austria, il Liechtenstein, la Danimarca, la Norvegia e la Svezia.

INTRODUCTION

Monitoring of the fish of the Rio Tovanella was conducted during the LIFE Project LIFE04NAT/IT/000190. This research revealed the presence of a mono-specific community of rainbow trout (*Onchorhynchus mykiss*). This information is important, because the rainbow trout, an allocthonous species introduced from North America, only in very rare cases breeds in Italian waters. A few cases of breeding populations of rainbow trout are known from Italy, such as those recorded in Veneto (Belluno Dolomites areas) (E. Marconato, pers. com.), Trentino (Paneveggio) and Abruzzo (Val di Sangro) (Turin et al. 1998). Breeding populations of rainbow trout are also known in other European countries such as Austria (Berg 2005; Jungwirth 2003; Schmutz 1995), Liechtenstein (Kindle 1993), Denmark (Larsen 1983), Norway (Hindar et al. 1996) and Sweden (Landergren 1999).

STUDY AREA

The study area is the Rio Tovanella (Rui de le Toanèle),

left tributary to the Piave River, running through the small lateral valley of the Val Tovanella, a nature reserve in the Ospitale di Cadore municipality (BL). This little stream originates at Monte Rocchetta, runs for 4 km, and joins the Piave downstream of Davestra at about 470 m a.s.l. It is characterized by strong mean slope; it flows downstream in a very incised valley characterized by the presence of canyons, gorges and jumps. The main geological substrates of the valley are a variety of calcareous layers (Dal Cortivo et al. 2007). Fish were sampled in a straight, 100 m long reach, at 550 m a.s.l.

MATERIALS AND METHODS

Fish populations were sampled by electro-fishing using a continuous current with adjustable voltage (3.8-7 Ampere, 300-500 Volt, 1 500 W). Fish sampling was conducted on 29.XI.2006 and was semi-quantitative, an abundance index (Moyle & Nichols 1973), modified as shown in tab. 1, and a population structure index (Turin et al. 1999) listed in tab. 2, were calculated.

Tab. 1. Moyle & Nichols abundance index (modified).

Abundance index	Number of individuals recorded in a straight 50 m long stream reach
1	1 – 2
2	3 – 10
3	11 – 20
4	21 – 50
5	> 50

Tab. 2. Population structure index.

Population structure index	Population structure level
1	Structured population
2	Non structured population – young individuals dominant
3	Non structured population – adult individuals dominant

RESULTS

The results of the fish sampling are listed in tab. 3. The sampled population was well-structured, with individuals distributed in 4 age-classes, and relative dominance of young and sub-adult individuals. Several male individuals were sexually mature and ready to spawn. Based on information provided by agents of the Corpo Forestale dello Stato who have been working in the area, the only species present before

Tab. 3. Fish assemblage of the Rio Tovanella.

Species present	Scientific name	Abundance index	Population structure index
Rainbow trout	<i>Oncorhynchus mykiss</i>	5	1

the '80s was the brown trout *Salmo [trutta] trutta* (M. Dalla Riva, pers. com.).

DISCUSSION

The rainbow trout was introduced in Italy from North America; only in exceptional cases this species can naturally breed in Italian waters. The rainbow trout has a great importance for angling and secondarily for management: when the rainbow trout is introduced in waters where populations of the most valuable marble trout are subject to strong pressure from angling, the presence of rainbow trout can reduce such pressure on the latter. Such a management choice is supported by the fact that the rainbow trout does not reproduce in nature and, generally, does not hybridize with the marble trout, thus avoiding the risk of crossbreeding (which occurs when the brown trout is introduced in waters where the marble trout is present).

However, Val Tovanella and a few other sites in Italy represent an exception in the biology of this species in Alpine waters and, more generally, in Italian waters. This ichthyological peculiarity will have to be assessed and carefully monitored in order to control the possible diffusion of a reproductive population of this alien species.

It is important to underline that even if the Rio Tovanella is in direct contact with the Piave River, those individuals of rainbow trout which are transported downstream from the Tovanella Stream during floods into the Piave have never been recorded to breed there. This observation suggests that the natural reproduction of the rainbow trout in Italian water is the result of a synergy of environmental and microclimatic factors, which only in very rare cases occur in Italian riverine habitats.

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