

## **The marble trout and Lake Þingvallavatn**

It was a special experience for the three of us to represent Iceland at a special conference on the protection of trout populations at risk, organized last August in Tolmin, Slovenia by the Continental Trout Conservation Fund. Tolmin is the home of the Soca river system, that today is the last resort of the famous marble trout. It derives its illustrious name from a unique colouring that resembles a fine marble. A few marble trout can reach huge size.

### **Restoration of the marble trout**

The marble trout is famous amongst anglers and environmentalists. Regrettably, it has been on the defensive for a long time. Today genetically pure marble trout are only found in eight remote tributaries of the Soca river, isolated beyond impassable water falls. The smallest stock consists of only 60 spawners, whilst the biggest counts roughly 2000. That is more than double the size of the largest population of the large-growing Ice Age trout in Lake Þingvallavatn, that spawns in River Öxará.

In Slovenia, not least in Tolmin, anglers associations, authorities and geneticists in academia have joined forces in a plan to restore the marble trout to its former place of glory as the dominant trout of the Soca river system. In Tolmin we saw first hand how well the plan is working.

### **The Ice Age trout**

With the big trout of Lake Þingvallavatn the Icelanders are privileged to have a population that like the marble trout is also unique. The lake is in itself a natural wonder, and as such is listed as a UNESCO World Heritage site. It harbours four types of arctic char – the only lake in the world to possess such diversity of the char, *Salvelinus alpinus*. Geologically, the lake is also unique. It is situated at the top of the Mid-Atlantic ridge, where the Eurasian and American continental plates are drifting apart. In the graben in between the plates ground water running off nearby glaciers seeps through the lava and forms the lake. It is the only place in the world where continental drift can be seen “live”.

For anglers like us the most remarkable feature of Lake Þingvallavatn, however, is the population of large brown trout which, since the end of the Ice Age, has existed isolated in the lake. Nowhere else is there a population consisting of individuals that on average become as large as in Lake Þingvallavatn.

For a long time the Ice Age relics in Lake Þingvallavatn have been endangered, like the marble trout in the Soca. The main population that spawned in river The Upper Sog, the outflow of the lake, was totally destroyed by the damming of the river in 1959 when a power plant was constructed. An additional accident happened when the plant was under construction and a huge storm broke a temporary cofferdam and swept away all the spawning gravel in front of the power plant tunnel where most of the trout had previously spawned. This destroyed any possibility of continued spawning in front of the river mouth.

Subsequently, the power company also used the lake as a water reservoir, creating large, un-natural fluctuations in surface levels. This destroyed a diversity of micro-stocks that spawned in gravel by springs welling from the lava-bottom, a unique feature of the lake.

For 40 years after the construction of the power plant the brown trout almost disappeared from the catch. One of us proposed in a book – „The Dance of the Big Trout“ - that the plant be removed (Össur Skarphéðinsson, Urriðadans, 1996, in Icelandic only). In the Nineties a campaign to resurrect the big trout population resulted in a multitude of restorative actions that at last appear to have yielded some positive results.

### **Improvement of spawning habitats**

The biggest difference was probably made by an agreement to reduce fluctuations in the surface levels, and by the release of fry when the stock was deemed to be in a critical condition. The fry derived from a broodstock taken in a small inflowing river, Öxará, which today is the most important spawning site in the lake's system. Presently, the big trout is again on the up-swing. The catch of trout has multiplied in the last two years and is far bigger than seen in the last 50 years. Very big trout, in excess of 20 pounds, are frequently caught. This year, since many decades, the first 30 pounder was caught. It is imperative that this positive development be used to ensure a lasting revival of the Ice Age trout in the lake.

We urge the National Power Company to execute forthwith the resolution that Alþingi, our Parliament, passed last spring to construct a fish-way from the lake to the Upper-Sog, where 5 cubic meter/second are presently diverted through the dam down the old river's pathway. A fish-way would allow trout to migrate down-river where some spawning also took place prior to the damming in 1959. Today a few trout squeeze through the bottom gate but neither the adults nor the offspring can return to the lake. That is not acceptable from any point of view.

The power company should also make plans to amend the spawning sites both in the river, and in front of the river mouth, by adding sufficient quantities of suitable gravel to replace the gravel swept away in the accident in 1959. Trials done in the last few years demonstrate that this is a feasible method to stimulate the emergence of new, site-related stocks both in the river, and outside the river mouth. A variety of other available methods should also be used to strengthen the stock elsewhere in the lake-system.

### **Catch-and-Release**

Anglers can also contribute to the enlargement of the stock by releasing all trout. That is the only responsible behaviour with respect to a unique population with an unsecure future. Despite the apparent increase in the last few years the population is still fragile. It can be rapidly reduced again by irresponsible angling. We cannot let that happen.

The largest trout are especially important for the survival of the brown trout in the lake. It is well known that they produce by far the greatest quantity of eggs. Their ova are also larger, and subsequently the emerging fry are more likely to survive. In addition, recent research on the spawning in river Öxará,

presently the most important spawning site today, have shown that the largest trout are also the latest spawners. Interestingly, whereas the greatest number of the mature trout spawn in October-November, the largest fish extend spawning well into January. This has great importance for the stock in river Öxará. Experience shows, that great floods can spoil the spawning in the river. However, the possibilities of flooding are much reduced after the turn of the year, hence, the largest trout provide an added guarantee for a successful spawning season. They are therefore the most valuable fish in the stock. Responsible anglers should therefore at all times ensure that all the large trout are released into the lake.

In the Soca river we experienced how anglers contribute to the successful building of the endangered marble trout population by practicing catch-and-release only. Anglers in Lake Þingvallavatn should invariably do the very same. The big trout provides the anglers with a unique and unforgettable experience. We don't have to kill them. Instead, let's give them a continuing life, and thereby ensure the successful existence of this unique population of the rare Ice Age trout.

**Össur Skarphéðinsson is an angler, a politician and the author of „The Dance of the Trout.“ Þorsteinn Stefánsson and Elías Pétur Þórarinsson are, despite a young age, very experienced anglers with an unrivalled experience of the big Ice Age trout in Lake Þingvallavatn.**