

> Living with the beaver

*2008 population survey
Future coexistence with the beaver in Switzerland*

*Summary of the publication
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> Summary

The reintroduction of the beaver is a success story of species protection in Switzerland. For this success story to endure, significant effort is required in the area of watercourse rehabilitation so that the beaver can find new conflict-free habitats where it can pursue its activities without being disturbed. To fulfil this requirement, rivers require more space in particular, something they lack today in many instances. This is the only way that the very high level of public acceptance the beaver benefits from today can be maintained. In accordance with the parliamentary counter proposal *Schutz und Nutzung der Gewässer (Protection and Use of Watercourses)*, drawn up in response to the popular initiative *Lebendiges Wasser (Living Water)*, also termed the rehabilitation initiative), the cantons will be obliged in future to designate zones for watercourses and to create cantonal rehabilitation programmes for watercourses. Both of these measures will provide the necessary conditions for the creation of new beaver habitats. As an important keystone species associated with watercourses, the beaver can help us, in turn, to restore rivers, streams and lakeshores to a natural state. This species directly fosters biodiversity through its wide range of activities.

Beaver survey

The last beavers in Switzerland were eradicated as far back as the early 19th century. They were reintroduced to the country from the 1950s. According to the first beaver population estimate carried out in 1978, there were approximately 130 animals in Switzerland. A second estimate in 1993 put the population at only 350. The *Biberfachstelle* (Beaver Service) organised a new nationwide survey in winter 2007/08 on behalf of the Federal Office for the Environment (FOEN).

Switzerland's beaver population has reached 1600 again

Over the course of winter 2007/08, more than 250 participants surveyed 6400 km of watercourses for beaver tracks. In excess of 16 000 individual tracks were observed and recorded on maps specially designed for the purpose. The tracks were then digitised and processed to enable their further processing in a Geographical Information System (GIS). Each individual track was then assigned to a beaver territory. The selected mapping method also enabled the differentiation between individual/couple territories and family territories. This was important for the ensuing population estimate which was obtained by multiplying the number of individual/couple territories by 1.5 and the number of family territories by 5.

We found 472 beaver territories in Switzerland and in watercourses shared with neighbouring countries. The population was estimated, therefore, as comprising 1600 animals. The beavers populate approximately 1400 km of watercourses and lakeshores. Today, in the Rhine catchment area, the species populates the major rivers of the Aare, Rhine and Thur practically continuously. In contrast, in the Lake Geneva basin there are three separate populations: one closed population on the river Rhône in Valais, one in the canton of Vaud and a third on the rivers Arve and Rhône in the canton of Geneva.

The beaver has gradually extended its range from the major rivers to their smaller tributaries. In 1993, almost all beaver territories were located on major rivers or lakes. Since then, 170 territories have been established on small tributaries and 32 territories have been established on stagnant water bodies with an area of less than 1 ha. Today, over 40 % of beaver territories lie on small watercourses, usually in agricultural areas where increasing conflicts with humans have arisen in recent years.

Red List status of the beaver

In 1993 there were only around 350 beavers living in Switzerland. They were distributed across the entire country in different small separate populations. The experts assumed at the time that the beaver had settled in habitats suited to its requirements. Based on this situation, the species was classified as “critically endangered” (CR in accordance with IUCN criteria). Since then, there have been many positive developments and the beaver populations in all parts of the country have increased, in some cases significantly. Based on the results of the population survey of winter 2007/08, we have formulated a proposal for the revision of the beaver’s Red List status. With 1600 individuals – of whom 800 are potentially capable of reproduction – and a range of around 6800 km², the risk status of the beaver could be classified two categories lower, i.e. “vulnerable” (VU). Hence the beaver would remain a protected Red List species.

Red List status: *vulnerable*

The beaver fosters biodiversity

The resettlement of the beaver marks the return of a species to Switzerland that influenced the landscape for millions of years prior to its disappearance. No other species can actively shape its habitat like the beaver: it fells trees, digs burrows and hollows in river banks, and can submerge entire stretches of land with its dams. All of these activities create wider structural variety and greater dynamics in and around watercourses. A large number of plant and animal species benefit from this. Both the numbers of species present and the biomass increase significantly in beaver territories. The beaver directly fosters biodiversity through its activities.

Hence, the protection of the beaver concerns not only the protection of an individual species but the protection of other living communities and, therefore, the biodiversity of watercourses in general.

Protection of the beaver means protection of living communities

Future management of the beaver

Despite the positive impact the activity of beavers can have on biodiversity, their presence can also become problematic if the rodent comes “too close” to us humans giving rise to human-beaver conflicts. The beaver is returning today to a landscape that has changed dramatically since its eradication 200 years ago. Many areas have been drained and rivers and streams culverted, straightened or permanently diverted. Today, one quarter of all stretches of water are completely artificial, significantly impaired or covered over. Two thirds of the network of watercourses that could be populated by the beaver have either suffered severe ecomorphological damage or are in an unnatural state. In addition to their often unnatural state, watercourses have been allowed less and less space to flow in recent years as a result of the construction of residential settle-

Human-beaver conflicts

ments and transport routes and of the intensification of agriculture. Roads line one or both sides of 70 % of the watercourse network that is potentially favourable for colonisation by the beaver, and land use often extends right up to the water edge.

If beavers create dams on such watercourses, they may cause drains to become blocked and the bordering agricultural crops to become waterlogged. If they dig their burrows in the river banks, they generally tunnel directly below the adjacent road, which may collapse. And because bank vegetation is often extremely sparse, the beaver may consume all of it and then move on to sugar beet and maize plantations or help itself to the white cedar hedges and fruit trees in private gardens.

Numerous actions can be taken, which, with a little good will on both sides, can defuse or even resolve the problems resulting from many of the conflicts that arise between humans and beavers.

In most cases, however, the problems are only resolved in the short term as all such conflicts are merely symptoms of a bigger problem: today many of our watercourses have too little space and are in a poor ecomorphological state.

Bearing this in mind, further conflicts between humans and beavers are to be expected as additional beaver populations establish themselves on small watercourses. To resolve such conflicts in the long term, our watercourses require one thing in particular: more space. For almost all of their activities, beavers only use a very narrow strip – just a few metres wide – along watercourses. Almost all of the conflicts that arise with the beaver can be avoided by providing a strip along the watercourse of between 10 and 20 meters in width. Beavers do not generally care whether their watercourses flow naturally or whether this buffer zone is present and have also populated highly unnatural watercourses in recent years. If the food supply is adequate – in agricultural areas, this includes a wide range of agricultural crops in addition to the riparian groves – the beaver has no problems. It will adapt the watercourse to its requirements later. This is precisely where the conflicts arise with us humans. This is why the beaver needs such free areas along watercourses if it is to live in harmony with humans. This is very important if the species is to continue to benefit from widespread public sympathy. In effect, our society also needs such free areas along watercourses:

- > They reduce the input of nitrogen and pesticides into the watercourses.
- > They provide habitats and migration corridors for other animal and plant species.
- > They provide retention areas in the event of flooding.
- > Naturally flowing watercourses provide recreational space for people.
- > From the perspective of the beaver, the most important fact about such areas is that they help to prevent the emergence of conflicts with humans.

The Swiss parliament acknowledged the fact that a need for action exists in the area of water protection and took legislative action in late 2009 by formulating the counter proposal *Schutz und Nutzung der Gewässer (Protection and Use of Flowing Water Bodies)* to the popular initiative *Lebendiges Wasser (Renaturierungs-Initiative)* (“Living Water”, the rehabilitation initiative). Under this counter proposal, it is planned to enact legislative changes from 2011 that will promote the rehabilitation of watercourses, reduce the negative impacts of hydropeaking downstream of hydro-electric

Preventive measures can help in the short term

Long-term protection and fostering of the beaver means the renaturation of watercourses

Ongoing federal programme

power stations, reactivate bedload management and re-establish the continuity of watercourses for fish.

This measure will give the cantons practical tools for use in the restoration of watercourses to a natural state. However, they will have to designate zones for watercourses and ensure that they are taken into account in structural and land-use planning. These zones must be landscaped and managed on an extensive basis in the future. The cantons are also obliged to develop and implement rehabilitation programmes. They are required by the Confederation to rehabilitate around 4000 km of watercourses over the next 80 years. Up to 65 % (approximately CHF 40 million annually) of the funding for these measures will be provided from regular federal resources on the basis of four-year programme agreements between the Confederation and cantons.

The measures may help to resolve numerous possible future conflicts through the creation of new habitats for the beaver.

It is essential that the beaver be incorporated into these rehabilitation programmes and general water protection measures from the outset. In fact, the species constitutes an ideal partner when it comes to the designation of watercourse zones and the development of rehabilitation programmes: as an indicator species, it shows us where our activities extend too close to the water's edge and where our watercourses need greater species diversity. As a flagship species, it can canvass for the restoration of naturally flowing watercourses, as a keystone species it helps to create new habitats for many species of animals, fungi and plants, and as a landscape architect it helps rehabilitate watercourses free of charge.

The beaver: an important partner

The beaver will spread further and populate watercourses which, in their current state, do not yet allow its conflict-free presence. Because the rehabilitation of our watercourses is a task that extends across several generations and the necessary space cannot always be guaranteed for watercourses, other short-term solutions are also required. The *Konzept Biber Schweiz* (Swiss Beaver Strategy) is an implementation guide created for the cantonal authorities. However past experience has shown that many processes and areas of responsibility vary from canton to canton.

Cantonal action plans and concepts

With the current development of the beaver population and the probable increase of the number of conflicts with the species, we must shift the focus from its strict protection to its management. The cantons should draw up cantonal action plans or strategies for this purpose. These are also indispensable tools to regulate beaver management at cantonal level. The strategies must provide a sound basis for the promotion of the beaver, the avoidance of conflicts and eventual control measures at population level. Because the beaver does not know the meaning of cantonal borders, cooperation between the cantons based on catchment areas is recommended.

In the event of conflicts with the beaver, long-term solutions implemented on the watercourses and based on rehabilitation should always be sought. Such solutions offer the best and most-cost effective protection in the long term. Moreover, they not only benefit the beaver from them, but many other animal and plant species too. Finally, our society also profits in that naturally flowing watercourses can provide important ecosystem services.