

## REVITALIZATION IN ZEZULKA

2013

In Zezulka the creek was historically displaced to the edge of the floodplain under the forest and eventually it was completely separated by the wall from excavated sediments from the adjacent meadows. The meadow was regularly mowed and mulched and was not valuable from the botanical perspective. The meadow was divided approximately in the middle by a historical landfill of construction waste.

As a part of the revitalization the creek was transferred into the middle of the meadow and modelled into a nature close meandering stream with ponds and fords. The landfills were removed from the plains. Before returning to the original trough a fork of the creek was created to improve drainage conditions of the site. The shape and depth of the trough are based on the assumption that revitalized trough must not waterlog the surrounding meadow because it is used for recreational purposes by local residents. For better recreational use and maintenance there was a small wooden footbridge built in the upper part.

The original creek trough was backfilled with soil from the excavation of a new trough. Attention was paid to maintain as many as possible of valuable and original trees on the site during revitalization so that the creek trough would fit better into the new environment.



## REVITALIZATION IN ZLATNICE

2013

In Zlatnice the creek copied the original road in the Sarecke Valley and was squeezed between the road and fences of the family estates. Due to the confined conditions the creek was fortified with stone or concrete and retaining walls. On the other side of the road the extensive reed beds with fragments of valuable floodplain meadows, as well as the remains of the old millrace could be found there. Given the significance of the sites a botanical research had been conducted before the revitalization work started. In the revitalization draft proposal the original culverts to the millrace were used and the creek was transferred back into the floodplain in the length of 650 m.

A meandering trough was again created here. It respected the most valuable areas of the floodplain. The revitalization was completed by 5 pools. The original creek trough was left there for better transfer of flood flows from the whole area. Water is transferred by distributive object assembled from big boulders into the revitalized and original trough. The remains of the original millrace were filled and thanks to cleaning up the edge of the adjacent forest water, meadow and forest environments were linked up. To increase attractiveness of the revitalization for people a gravel footpath and a wooden bridge over the creek were built across the centre of the meadow.



## REVITALIZATION UNDER JENERALKA

2013

The third location Under Jeneralka was least affected by human activities. Although the creek was historically displaced to the edge of the floodplain, thanks to a long period of time without utilization the original floodplain changed into reeds and the creek began gradually to meander again. Revitalization aimed to support natural winding of the trough and creation of several pools in the area. This also included the revitalization of the Krutecky Creek, which was transferred from the original concrete trough running along the road into the floodplain, where it meets other springs and flows into the Litovicko-Sarecky Creek.

Treatment of the floodplain is based on the total waterlogging of the area. The floodplain is maintained by regularly mowed water meadows. For better access a wooden plant path was built in the centre of the floodplain. The completed revitalization was affected by floods in June 2013, which was an equivalent to flooding roughly five years ago. At all three locations the water spilled into the floodplain and thus a process of a new trough shaping started. Gravel fords and sediments as well as pools arose there.



## FAUNA AND FLORA

In the area where revitalization has been accomplished used to be wet meadows. When the regular mowing was finished the meadows started to overgrow with aggressive species of grass, primarily with reed and phalaris. Restoration of regular mowing after the revitalization caused suppression of aggressive grasses and enhancement of some competitively weak species, e.g. *Galium wirtgenii*, *Carex cespitosa*, *Cardamine pratensis* (Cuckooflower) or *Lychnis flos-cuculi* (Ragged-Robin). Even some species that have not been observed there for decades, such as the threatened *Carex distans* and *Hypericum tetrapterum* (Peterwort) have appeared there.

Creation of new pools and brooks supported biodiversity of the area, too. Ponds overgrew with two kinds of rarely seen seaweeds of *Platycerium* (Staghorn), *Potamogeton crispus* (Curled Pondweed) and *Potamogeton trichoides* (Hairlike Pondweed), *Persicaria amphibia* (Longroot Smartweed), *Spartanium erectum* (Simplestem Bur-reed), *Typha angustifolia* (Lesser Bulrush) and *Alisma plantago-aquatica* (European Water-plantain). Shores were colonised by some valuable wetland species, especially by *Nasturtium officinale* (Watercress), *Berula erecta* (Lesser Water-parsnip), *Myosotis scorpioides* (Water Forget-me-not), or *Brooklime* (European Speedwell) and *Veronica anagallis-aquatica* (Water Speedwell). The newly created water bodies are also of zoological importance, as they became a place where many animals evolved, including dragonflies, e.g. *Libellula depressa* (Broad-bodied Chaser) and *Pyrrhosoma nymphula* (Large Red Damselfly) and amphibians - *Pelophylax kl. esculentus* (Edible frog), *Rana dalmatina* (Agile Frog), *Rana temporaria* (Common Frog), *Bombina orientalis* (European Fire-bellied Toad), *Bufo bufo* (Common Toad) and *Lissotriton vulgaris* (Smooth Newt).



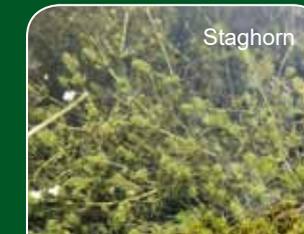
Marsh Marigold



Common Toad



Ragged-Robin



Staghorn

# Revitalization of Litovicko-Sarecky creek



## LITOVICKO-SARECKY CREEK

**Length of river:** 21.28 km

**Catchment area:** 62.9 km<sup>2</sup>

**Tributaries:** Jenecsky, Zlicinsky, Nebusicky, Krutec-ky, Zlodejka and Lysolajsky creek

**Flow Manager 0.0 to 19.5 km:** City of Prague

**Flow Manager 19,5–21.28 km:** Povodi Vltavy s.p.

**Investor:** City of Prague represented by the Environmental Protection Department of City Hall of Prague

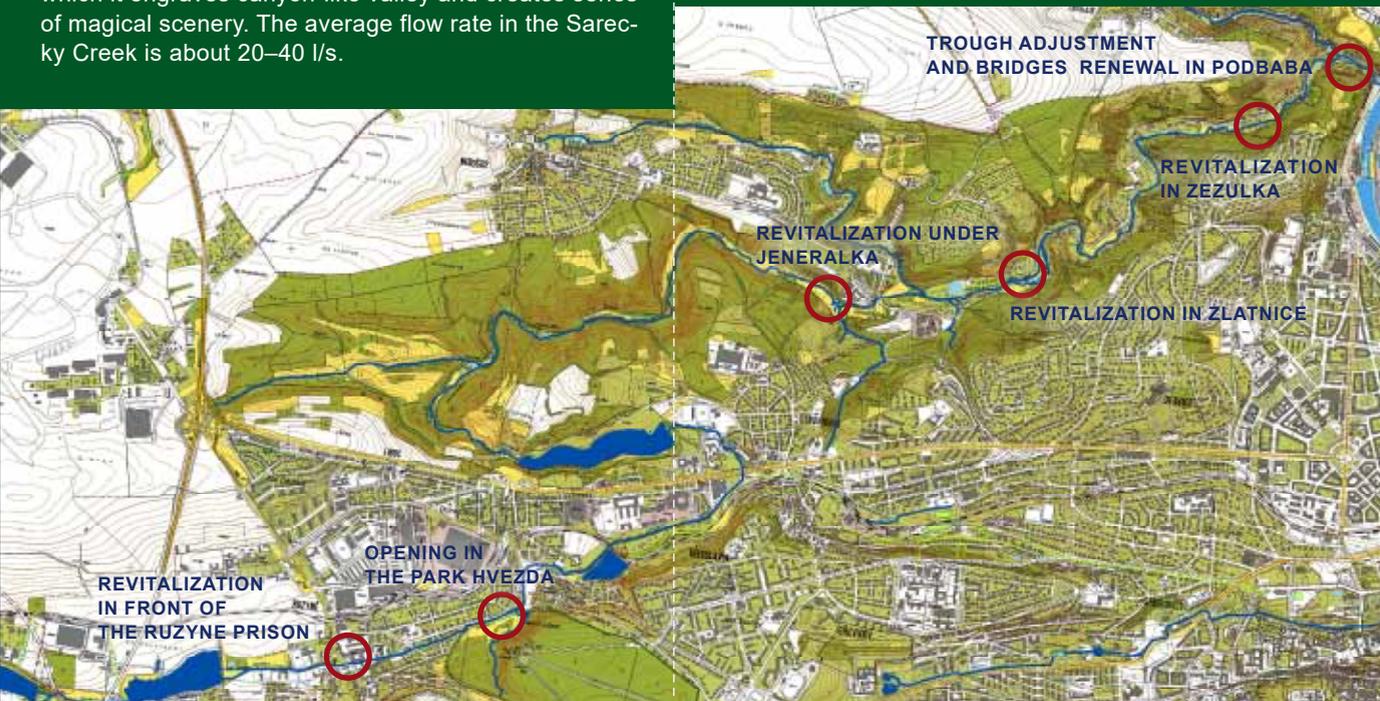
A compound name 'Litovicko-Sarecky' refers to two parts of the creek. The upper part is named after the Litovicky Creek, which flows into the reservoir Dzban. The Sarecky Creek gives its name to the lower part of the creek below the reservoir.

The Litovicko-Sarecky Creek springs near the village Chyne in the western part of the Central Bohemia Region and flows into the Vltava River in Prague-Sedlec, where the Imperial Island ends. The Litovicko-Sarecky Creek initially flows through the system of Hostivice ponds (Litovicky, Kala, Brve, Strnand) which are situated outside Prague. The creek flows into Prague just above the retention basin Jiviny and continues into the dam Dzban. Large part of the creek flows through the Sarecke Valley, where the creek cuts into hard rocks, in which it engraves canyon-like valley and creates series of magical scenery. The average flow rate in the Sarecky Creek is about 20–40 l/s.

From the historical point of view the Litovicko-Sarecky Creek is one of the most important Prague's streams. Its water served and still serves for supplying service water to the Prague Castle. During the reign of Rudolf II., the so-called castle stream was built from the Liboc Pond, which brought water from the open trough to the Prague Castle. To ensure sufficient amount of water for this creek a system of Hostivice Ponds behind Prague have been created there.

When people settled down close to the creek, they started to adjust it to their needs. With the development of the use of water as a driving force for mills and iron-mills the stream was gradually straightened and transferred to the edge of the floodplain meadows that were used for farming. There were millraces and mill ponds built but still it was almost a natural creek. Fundamental changes occurred in the 60's of the last century, when massive capatizing and consequently fortifying the creek trough were accomplished in Ruzyne and Liboc. In the creek the pipes were laid completely everywhere in Ruzyne in the length of 960m.

Another phenomenon that totally changed the character of the creek was creation of the construction waste dump in the floodplain and on the banks. This led to the destruction of natural retention function and deterioration of runoff capability. In order to at least partially rectify these historical damages, the Litovicko-Sarecky Creek and its floodplain has been gradually revitalized.



## OPENING IN THE PARK HVEZDA

2010

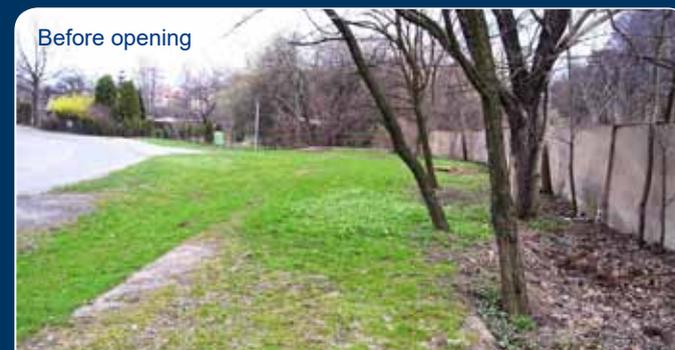
A massive vaulting of the Litovicko-Sarecky Creek below the Ruzyne prison and up to the Park Hvezda took place in the 60's of the 20th century.

The revitalized part begins with the mouth of the original vaulted part at the intersection of the Ruzynska and Stochovska streets. Vaulting of reinforced concrete U-frames covered by reinforced concrete panels has gone through a green part between the Ruzynska Street up to the intersection of the Ledicka, Ruzynska and Jinocanska streets. This vaulting has completely degraded this important Prague's creek to the sewer without any life inside, and any aesthetic and ecological functions. Therefore a project was assigned for its overall revitalization and uncovering of the Litovicko-Sarecky creek along the Park Hvezda.

The revitalization project dealt with uncovering the creek in the length of 280 m. The original concrete vaulting in the entire length was removed and a new opened trough was modelled into a nature close way. The newly opened trough is stabilized with rocks and partially with vegetation fortifications at the bottom and in the banks. Around the shores alder trees and shrub willows were planted. In the area below a bus stop a new footbridge was built to enter the Park Hvezda.



Before opening



The area before revitalization

## REVITALIZATION IN FRONT OF THE RUZYNE PRISON

2011

In 2011 the revitalization of the Litovicko-Sarecky Creek continued in the park in front of the Ruzyne prison. Historically a pond was located there. In the 60's the creek trough was straightened and its bottom concreted into the shape of a trapezoid and thus the water element was separated from the adjacent park. Furthermore, ca 5 cm of water only flew at the bottom according to normal flow rates, which is totally unsuitable for the water fauna and flora evolution.

As a part of the revitalization the original concrete trough was cleared and the creek was stabilized by heavy stones, as well as at Park Hvezda. Deeper and shallower parts were made in the bottom in order to ensure enough water at any time, even by lower flow rate. In order to connect the water and surrounding greenery the left shore was reduced in several places and a gradual access to water was created. Several stones were also placed on the banks for sitting. The revitalized trough was planted with wetland and hygrophilous vegetation.

## TROUGH ADJUSTMENT AND BRIDGES RENEWAL IN POBBABA

2011

In 2011 the old inconvenient bridges were removed and were replaced by new ones within construction of the flood control measures in the Litovicko-Sarecky Creek in Podbaba. Clean up and revitalization of the creek in the length of about 200 m was also a part of this construction. A stone bed and pavement reinforcement were made around the bridges.

Original locust trees which lined the banks of the creek were already in critical state, they have been cut down and replaced by new *Acer campestre* (Field Maple). The creek trough was planted with wetland blooming vegetation supplemented by planting shrub willows that do not grow so high.



## Characteristics of the trough condition of the Litovicko-Sarecky Creek

Natural: 6.64 km

Close to nature: 6.51 km

Technically modified: 5.53 km

Vaulting: 0.83 km

Water surface: 3.09 km

Revitalized: 1.83 km

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Aerial photos: www.andruvision.cz

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