



Länsstyrelsen
Skåne



Restoration of sandy habitats in Czech Republic and Slovakia

a study and net-working trip in May 2017 together with the German Life-project Sandrasen



Networking:

A study and net-working trip together with the German Life-project Sandrasen to sand restoration projects in the Czech Republic and Slovakia during May 2017

In Czech Republic, Roman Hamersky from the nature conservation agency showed the results from restoration projects on the steppes in the Louny region, and Ivana Jongepierova from the nature conservation agency showed a large meadow managing project and sand dune restoration projects in the White Carpathians. In Slovakia Viera Sefferova from DAPHNE (Institute of Applied Ecology) with colleagues showed the restoration projects of removing bushes/trees and encroachment in sand dunes/salt marshes in western and southern parts of the country, as well as, the sand dune restoration project at the Zahorie military training area together with Katherina Klimova from BROZ.

Date

May 7th to 13th 2017

Participants from Sand Life

Gabrielle Rosquist (project leader), Marit Hedlund, Magnus Jönsson, Jörgen Nilsson and Karl-Johan Pålsson (assistant directors) and Gunilla Lundh (dissemination in Sand Life) at CAB Skåne.

Picture on front cover: pale orchid in the White Carpathians (upper left), a blister beetle in the Devinska Kobyla (upper right), Balcan clary in the Louny steppe region (lower left) and green lizard in the Zahorie military training area (lower right).

Sand restorations in the Czech Republic and Slovakia, May 2017

In May 2017, Sand Life went on a study and net-working trip to the Czech Republic and Slovakia together with the German Life-project Sandrasen, to visit sand restoration projects in eastern Europe. The purposes were to exchange experiences with Sandrasen, but also with the different Czechian and Slovakian restoration-projects.

The sandy landscapes that occur in southern Sweden are very similar to those in Central and Eastern Europe, and we share the same species composition. For Sand Life and the projects After-life, it is important to gather experiences in the restoration and management of these habitats, as well as, the importance of communication and information about the conservation of environments and species in sandy habitats. Among other things, the unique habitat “Xeric calcareous sandy habitat” “sandstäpp” will be in focus during the trip. It is a priority habitat type within the Habitats Directive and the “sandstäpp” found in Sweden only occurs in Skåne and a small amount on Öland.

In the Czech Republic we visited the steppes in the Louny region in the northern part of the country where Roman Hamersky from the nature conservation agency showed the amazing hills with restored steppe vegetation. We also were guided in the white Carpathians by Ivana Jongepierova from the nature conservation agency to see the huge areas of managed meadows and restorations of inland sand dunes. In Slovakia we were guided by Vera Sefferova from DAPHNE and her collaborators Jan, Tomas and Monika. We visited restored grasslands at the little Carpathians outside Bratislava and restorations of sand dunes and salt marshes along Danube in the southern part of the country. We also had the chance to see the large scale sand restorations at the Zahorie military training area with Katherina Klimova as our guide.



Restorations of steppe vegetation at the Louny region in the Czech Republic

The first visit on the trip was in the Bohemian Highlands to the Louny steppes where Roman Hamersky guided us on the spectacular small hill tops in the landscape. The hills were formed by volcanic activities in the Tertiary and then shaped by weather and wind. Today there are short-grassed steppe vegetation developed in the area because of the warm summers and dry winters. The surroundings consist of orchards, wine yards and arable fields.



The Louny steppes in northern Czech republic

The steppe vegetation in the area has declined due to ploughing, forestation, mining or other kinds of exploitations, but also due to encroachment by bushes and trees. The traditional farming of the hill slopes was grassing and this was abandoned in the 1980s. During the period 2011 to 2016 the encroachment has been removed due to the Life+ project with protection of sites with the thermophilic species and communities (LIFE09 NET/CZ/363; <http://www.ochranaprirody.cz/en/life/life-lounske-stredohori-steppes/>).

The first hill we visited was Oblik-Srdov-Brink nature reserve “Three Hills” north of the town of Louny. The encroachments of shrubs, planted acacia and tall grasses has been removed on parts of the hill slopes. Today the hills are grassed with cattle and sheep gathered by dogs and herds. The grassing is moved around in the area to get variation. On the top of the hill grassing every second year is enough to favor the steppe vegetation. However, problems

with *Arrhenatherum elatius* is handled by mowing (which in turns disfavor the *Stipa*-population). For the actions the land owners is contracted in the first place to get long term management in the area. Today the hills have an open steppe vegetation with beautiful blooming of *Salvia nemorosa*, *Linum austriacum* and *Stipa pennata*. The species richness is extremely high with many rare specimens.

The second hill we visited were Rana-Hradek three summit hills with a large population of the European ground squirrel. Larger areas of encroachments have been removed on the hill slopes, that are wide open today and the biodiversity is favored. For example, *Astragalus danicus* were increasing after removing the *Crataegus*-bushes and grassing were introduced.



European Ground squirrel at Rana-Hradek hills in the Czech republic.

Short stop at the Kamenna Slunce mining site with spectacular geological phenomenon of volcanic gases.

The last stop was at a grassland site on a old “river terrace” with a vegetation that were similar to the Swedish “xeric calcareous grassland”, with flowering *Dianthus arenaria* ssp. *bohémica* and *Koeleria pyramidata*. The restorations of the encroached site first included removing of the bushes and then repeatedly taking away about 20 centimeter of the top soil during the period 1988 to 2005. In some places deep digging have been done. The management after the restorations were harrowing.

Restorations of Natura 2000-sites outside Bratislava in Slovakia

At Devínska Kobyla outside Bratislava, the capital of Slovakia, Viera Sefferová from DAPHNE met up with her colleagues Monika, Jan and Tomas (from SNC – State Nature Conservancy). The area is one in a system of several Natura 2000-sites. A

spectacular bare sand stone slope with breeding bee eaters meet us when we climbed a steep path and behind us a wide view over Danube and Austria. The area is a mixture of open restored grasslands, encroachment of shrubs and trees and natural broad leaved forests.

The traditional grassing in the area by cattle and sheep was abandonment and lead to encroachment by pioneer plants and alien invasive species (IAS). The restorations of the grassland and the steppe vegetation, as well as the forests, have been done during the period 2012 to 2016 were made due to the Life+ project “Restoration of Natura 2000-sites in cross-border Bratislava capital region” (LIFE10 NAT/SK/080; <http://www.broz.sk/natura2000ba/en>).

Removing encroachment of bushes and trees has mainly been made by cutting and logging. However, some of the species became invasive and spread in the area, mainly *Robinia*, but also the otherwise rare *Fraxinus ornus*. The control of the invasive plants was first made by cutting, however, the stumps were shooting new stems. Then a new way of controlling was tested by injecting round up by drilling 5- centimeter deep holes into all the new stems (2-3 milliliter round up in each hole). An enormous work that succeeded.



Devínska Kobyla outside Bratislava, Slovakia

It was hard to find interested animal keepers to reintroducing grassing, because of the steepness of the area and too little to grass. Today, two herds of sheep/goats are grassing the area after the orchids have flowered. Since the temperature in the area is high the grazing is in the morning and in the evening and because

of the topography no fences are built and the guarding is made by shepherds. One interesting result was that, although goats have grassed in a patch with orchids, the blooming of *Orchis morio* and *Orchis ustulata* were enormous the year after.

The management of the broadleaved forest is to favor the native plant species and leave a structured forest.

Since the area is close to the city there is a nature trail with signs and various kinds of sculptures explaining the nature and geology for visitors. Because of the high amount of visitors, the project worked with a lot of information in media, during meetings, workshops and through articles. It was important to show with historical maps that the area has not been managed during the last 70 years and why the restorations were needed. It was also important to talk about orchids and pheasant's eye, plants that the public recognize and care about.

Restorations of sand dunes and salt marshes in southern Slovakia

During the second day in Slovakia we visited restored sand dunes and salt marshes in the Danube region on the boarder to Hungary in the southern part of the country.

The restorations were made in the Life+ project "Restoration of endemic Pannonic salt marshes and sand dunes in southern Slovakia" (LIFE 10 NAT/SK/083; <http://www.daphne.sk/pannonicsk>), where the sand dune restorations focus on the habitats 6120 (Xeric calcareous grasslands) and 6260 (Pannonic sand steppes).



Sand dunes in the Danube region, Slovakia

The Pannonic steppes at Chenkov have originated from deposits from the Danube river. The historic use of the sand dunes was grazing and in the 18th century to the middle of 20th century the area was totally open with wind-blown sand and *Juniperus*. The land was abandoned and the pine trees spread over the open land or attempts to plant trees have been done and IAS like the tree of heaven is spreading in the area. Today, nature conservation plan to protect and restore about 250 of the 600 hectares' large area. Parts of the encroachment have been removed and introduction of grazing with cattle will start in 2017, both in the open areas and in the forests. Libor, from SNC, have done population studies since 1990th on three threatened species in the area; *Ephedra distacya*, *Alkanna tinctoria* and *Colchicum autumnale*. The aim was to detect threats such as climate effects on the populations.

In the forests of Chenkov the aim was remove the foreign species and develop a natural forest with structures and low intense grazing. Tomas from SNC told us about the problems of combatting "the tree of heaven", where logging didn't work and round up is the best method. The objective in the whole area is to have a Popular-forest were parts will be grazed to hold back the tree of heaven and the Robinia-trees. Palo from BROZ told us about the grazing project that will cover about 50 hectares in the forest.

In the afternoon we visited the salt marshes in the Danube region at Kameninske skaniska, where the mayor of the town met up. To the 1950th the salt meadows were grazed by cattle, but in 2011 they were totally encroached. In the Life-project the encroachment with shrubs and trees were removed and parts were mulched for future mowing and grazing. The grazing has been adapted to the special climate conditions with winter and early grazing with cattle when wet in spring (good for wader-birds) and sheep grazing in dry/hot summer. The area had internal challenge with gathering 250 land owners, but the solution was to form a NGO. To favor the vegetation in the salt marshes, top soil was removed to increase the evaporation and the salt content.

Short stop at a waste dump in a local sand extraction area that also were encroached with *Robinia pseudoacacia*. The Robinia was removed and the dump digged up. Today the area is grazed by local sheep and a few goats.

Restorations of inland sand dunes at the Zahorie military training area in Slovakia

During 11th of May we visited Zahorie military training area northeast of Bratislava. It is an almost 28 000 hectares' large area of forests and open sand dunes that has been used for military activities since 1923. Minor parts of the area had been kept open because of the military activities that decreased after the communism, but in most parts were encroached by shrubs and trees.



Inland sand dunes at Zahorie military training area in Slovakia

Restoration actions were made at about 500 hectares during the years 2006 to 2011 in the Life+ project “Restoration and management of sand dune habitats in Zahorie military training area” (LIFE06 NAT/SK/115) to develop the Pannonic inland sand dunes and dry heaths. We met the project leader Katherina Klimova from BROZ that had to work hard for arising awareness of the military staff about the biodiversity in the open sand and succeeded to develop a cooperation in the area that still exist. It was thanks to her and her contacts that made it possible for us to visit the area.

Logging of trees and removing shrubs have been the main action, however there are too much material from the shootings in the trunks and roots so it is difficult to remove it from the area. The IAS Black locust have been removed from the site.

During the winters controlled burnings were implemented to reduce litter and favor the heather. However, the grass *Calamagrostis epigeios* has been favored by the fire.

Today the SNC and BROZ unfortunately have no funds for managing the area and today a new generation of Pine trees is growing in the restored areas.

Restorations of steppe vegetation in the White Carpathians in the Czech republic

In southern Czech Republic at Veselí nad Moravou we met Ivana Jongepierova at the NGO Czech union for Nature Conservation in the White Carpathians that work with nature conservation and raising awareness of biodiversity among the public.

The first stop was a small meadow that was restored in 2011, when seeds of grasses and herbs were sown on a former cultivated pasture. The composition was 90/10 of grass and herb seeds, with about 30 species. The amount was 2 grams per square meter.



Extensive meadows in the White Carpathians, Czech republic

South of Javorník, we visited huge areas with managed meadows at a total area of about 700 hectares, with 350 hectare hot spots and 350 hectares' buffer zones. The total protected area was 4 000 hectares which included different zones with different values for biodiversity, from hot spots to the actual villages. The buffer zones were ploughed during the communism time and has now been restored to meadows by grown natural meadow seeds. The meadows were cleared from encroachment during 2011 to 2016 in the Life+ project "Integrated protection of rare butterfly species of non-forested habitats in the Czech Republic and Slovakia" (LIFE09 NAT/CZ/364; <http://www.ochranaprirody.cz/en/>) and are now mowed on

three occasions by the NGO during the period June to September too get variation. New trees, mainly oaks, are planted in the meadows. It will be appreciated with autumn grazing at the mowed areas, but today at least deer are grazing. On a moist area, *Tilia* were cut and the flora reestablished in a few years. The organization works frequently with information and have guided tours during the growing season.

The last stop was at the military training area southwest of Veselí nad Moravou, now mainly with Pine-forest but in the 18th century with open sand and also called “the Moravian Sahara”. At the open area along a railroad, the sand dunes have been restored by removing the top soil during 2013-2014 and in 2016. To manage the reopened patches Ivana is planning light ploughing. The pH-value in the soil is 4-5 and similar to the inland dunes at Revingefältet in Sand Life.



Former military training area in southern Czech republic

Learned from the trip

- It was obvious the IAS should be removed at an early stage, logging is not effective and poison is the “only” solution. A time consuming work with drilling and injecting round up has given effect.
- Grazing with sheep/goats in orchid rich areas do not necessarily reduced the number of orchid-plants.
- Grazing can also be possible in accessible areas with sheep/goat guarded by dogs and shepherds, like in the Louny steppes and Devínska Kobyla.

- The nature trail at Devínska Kobyla was innovative and addressed to all visitors, despite age. Especially the sand pit with hidden fossils and the huge wooden-*Meloe* sp.
- Information and communication in advance is important regardless where you will restore nature in Europe. The closer to human settlements the action will take place, the more important is information. For example, in Slovakia, the actions close to Bratislava needed years of information, while the actions in the Danube-region could be done directly.
- The advantage of involving local land owners or contractors is also wide-spread.
- Regular collaborations with other state agencies is important, like the long term work together with the military institute that made it possible to restore the open sand dunes at Zahorie military training area, which is similar to the collaborations between the county administration and the military force in Skåne, Sweden.
- The successful work in protection huge areas in the White Carpathians, with enormous areas of buffer zones.
- To visit the Moravian Sahara to realize that they do the same restoration activities as we do in Swedish inland dunes.

Thanks

We would like to thank Life Sandrasen for inviting Sand Life to make the study trip and net-working tour together with their staff members. We would also like to thank Sandrasen together with the organizers in Czech Republic and Slovakia for an excellent planned tour. At last, but not at least, large tanks to our hosts in the organizations that we met and for well-done guided tours in the field, especially to the contact persons Roman, Viera and Ivana – THANK YOU ALL ☺

Participants

The participants from the different countries and organizations:

Sand Life	Sandrasen	Check republic	Slovakia
Marit Hedlund	Holger Roessling	Roman Hamersky	Viera Sefferova (DAPHNE)
Magnus Jönsson	Janine Ruffer	Ivana Jongepierova	Monika Chrenkova
Gunilla Lundh	Anna		Jan
Jörgen Nilsson	Stephanie		Libor Ulrych
Karl-Johan Pålsson	Andreas		Pavol Littera (BROZ)
Gabrielle Rosquist			Katarina Klimova (BROZ)
BROZ (Regional Association for Nature Conservation and Sustainable Development) www.broz.sk			
DAPHNE (Institute of Applied Ecology) www.daphne.sk			

Visited Life-projects

During the trip we visited different ecological restoration-projects, among them several Life+ projects:

- Czech Republic – Louny steppe region LIFE09 NAT/CZ/363
<http://www.ochranaprirody.cz/en/life/life-lounske-stredohori-steppes/>
- Slovakia – Bratislava capital region LIFE10 NAT/SK/080; <http://www.broz.sk/natura2000ba/en>
- Slovakia – Danube region LIFE 10 NAT/SK/083;
<http://www.daphne.sk/pannonicsk>
- Slovakia – Zahorie military training area LIFE06 NAT/SK/115
- Czech Republic – White Carpathians
<http://www.bilekarpaty.cz/csop/pozemkovy-spolek/>
- Restorations of meadows in the white Carpathians were made during the years 2011 to 2016 in the Life+ project “Integrated protection of rare butterfly species of non-forested habitats in the Czech Republic and Slovakia” (LIFE09 NAT/CZ/364;
<http://www.ochranaprirody.cz/en/>)

Program for the study trip

The program for the study trip from departure on Sunday the 7th to Saturday the 13th of May (in Swedish):

Söndag 7 maj

- 8:30 avresa från Svågertorp (restid ca 9,5 h Malmö - Litoměřice över Rödby och Berlin)
- Ankomst Litoměřice i norra Tjeckien

Måndag 8 maj

- Omgivningarna runt Litoměřice

Tisdag 9 maj

- Ca 9.00 avfärd mot Slovakien och Bratislava
- Ca 14.00 ankomst till Bratislava
- 14:00 – 18:00 SCI Devínska Kobyla “Restoration of NATURA 2000 sites in cross-border Bratislava capital region” - LIFE10 NAT/SK/080. SCI Devínska Kobyla is located within capital city (on its edge). There are dry grassland communities, partly on sand, partly on calcareous base. There was realised restoration management – removal of scrubs and tress, elimination of invasive trees, reintroduction of grazing and educational activities.
- Accommodation in Bratislava.

Onsdag 10 maj

- Omgivningarna runt Bratislava
- "Restoration of endemic pannonic salt marshes and sand dunes in Southern Slovakia" LIFE10 NAT/SK/083. Danube Lowland salt marshes and sand dunes are very rare remnants of original and historically widely distributed native habitats in intensively managed lowland agricultural landscape. We have 4 sites with location of sand dunes, 3 of them are small scale.
- 8:00 – 10:00 Travel to SCI Čenkov
- SCI Čenkov – eradication of invasive tree *Ailanthus altissima* and planned reintroduction of grazing within forest located on sand dunes.
- SCI Marcelovské piesky – introduction of grazing
- SCI Nesvadske piesky – removal of sand barrier to allow better wind erosion, removal of invasive species - optionally

- Travel back to Bratislava. Accommodation in Bratislava.

Torsdag 11 maj

- Ca 9.00 avfärd mot södra Tjeckien och Veselí och Moravou (ca 3 h)
- Stop at Záhorie military training area in Slovakia.
“Restoration and management of sand dune habitats”
LIFE06NAT/SK/000115. The main project objective was to contribute to the development of the Natura 2000 network in Záhorie Military Training Area through the conservation, restoration and enhancement of important sand dune habitats and species. At three Sites of Community Importance (SCIs Kotlina, SCIs Šranecké piesky, SCIs Bežnisko) within the project area we have restored the habitats of open sand dunes and dry heaths at a total area almost 500 hectares. The specific habitat restoration measures – cutting of woody vegetation (pines), sod cutting, controlled burning, elimination of the alien invasive plant species.
- Ca 16.00 ankomst till Veselí och Moravou i Tjeckien

Fredag 12 maj

- Omgivningarna runt Veselí och Moravou

Lördag 13 maj

- Hemfärd tidigt (tar ca 13 h)