LIFE Project Number

LIFE10 NAT/SK/083

FINAL Report

Covering the project activities from 01/09/2011 to 30/06/2017

Reporting Date

11/4/2018

LIFE+ PROJECT NAME or Acronym

Restoration of Endemic Pannonic Salt Marshes and Sand Dunes in Southern Slovakia

Project Data	
Project location	Southern Slovakia - Nitra Region - Districts of Nové Zámky, Šaľa and Komárno
Project start date:	01/09/2011
Project end date:	31/12/2016 Extension date: 30/06/2017
Total Project duration	70 months
Total budget	2.367.530 €
Total eligible budget	2.367.530 €
EU contribution:	1.773.280 €
(%) of total costs	74.9
(%) of eligible costs	74.9
Beneficiary Data	
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1.1 List of abbreviations

BROZ - Regional Association for Nature Conservation and Sustainable Development
CCA - Canonical correspondence analysis
CR – Critically endangered species
Daphne IAE – DAPHNE – Institute of Applied Ecology
DVD - digital video disc
EC – European Commission
FMP - Forest management plans
GPS - Global Positioning System
IAS – Invasive Alien Species
IR – Inception Report
MoE – Ministry of the Environment
MPs – Management plans
MTR – Midterm report
NFC - National Forest Centre
NGO - Non-governmental organization
NLC – National Forest Centre
PLA - Protected Landscape area
NP – National Park
PR – Progress report
SC – Steering committee
SCI – Site of Community Interest
SECS - Slovak Electronic contracting system
SKUEV – national synonym for SCI
SLF - Slovak Land Fund
SNC – State Nature Conservancy

2. Executive Summary

Project objectives

Danube Lowland salt marshes and sand dunes are very rare remnants of original and historically more widely distributed native habitats in intensively managed lowland agricultural landscape. They are bounded to the Pannonian biogeographical region, located at the northern edge of their distribution in Slovakia. Similarly as in Slovakia these habitats are endangered in the whole Pannonian region.

The project was focused on 5 priority habitats. There are two types of priority habitats bound to intensively salinated soils: Inland salt meadows (1340*) and Pannonic salt steppes and salt marshes (1530*). There are two habitats that are bound to open sand dunes: Xeric and calcareous grasslands (6120*) and Pannonic sand steppes (6260). The Pannonic inland sand dune thicket (91N0*) habitats are forest mosaics composed of open poplar woods and common juniper.

The project aimed to improve and maintain a favourable conservation status of those habitats, thus preserving the integrity and quality of the Natura 2000 network. The project activities supported also typical flora and fauna of the habitats. Essential for the achievement of successful results was the introduction of regular and appropriate management, including traditional agriculture practices (mainly grazing), elimination of invasive plant species and preserving appropriate hydrological conditions at the targeted sites.

Key deliverables and outputs

The preparatory studies on “Eco-hydrological restoration of salt marshes”, “Ecological restoration of sand dunes” and on “Habitats restoration and management by grazing” prepared.

Management plans for 15 SCIs were elaborated and approved by relevant authorities.

Project achieved a great success in communication with foresters on forest special protection measures. In total an area of 66 ha (64.5 ha at SCI Čenkov and 1.5 ha at SCI Nesvadské piesky) was included as functional area (compared to 8 ha as planned) into the Forest management plans for the SCIs concerned. Alien invasive tree species *Ailanthus altissima* was eradicated from the area of 123 ha.

Restoration management was applied on area of 379.3 ha of salt marshes and 16.9 ha of sand dunes. Established conditions for long term traditional pasture management, including purchase of animals (cows, sheep, goats and water buffalo), building shelters, fences and water resources. Traditional land use practices (grazing) implemented on the area of 350 ha on 8 salt marshes and 3 sand dune sites.

Constructing documentation and permission for hydrological restoration of salt marshes was obtained. Water regime was improved on SCI Kamenínske slaniská by filling-in of drainage ditch in length 450 meters and at SCI Bokroš in length of 40 meters. Restoration of the salination process by the top soil removal was realised on 3 ha of salt marshes on 6 project sites.

Information panels elaborated and installed on the project sites and promotional material as pull ups and laminated posters elaborated and distributed among stakeholders (see the amounts below in the summary of implemented project activities).

Brochures on salt marshes and on sand dunes in 3 languages printed. Posters on salt marshes sand steppes printed and distributed among stakeholders.

Toolkits for basic school teachers about salt marshes and sand dunes and identification keys of salt marshes and sand dunes species were prepared, printed and distributed among teachers.

Reports of habitat, hydrological and pedological monitoring prepared.

Layman´s report printed and After-LIFE Conservation Plan prepared.

Summary of implemented project activities

Before management measures were implemented, **studies were made and expert documentation prepared.** Studies on eco-hydrological restoration of salt marshes, ecological restoration of sand dunes and on habitats restoration and management by grazing were finalised and concrete site specific restoration methods were proposed. Two technical documentation studies were prepared for restoration of salt marshes, which were focused on top soil removal on small-scale plots and filling of drainage channel at the SCI Kamenínske slaniská salt marsh, for which a construction project was prepared. Management plans for 15 SCIs were prepared, representing a key tool for maintaining the project results. Delimitation of forest functional areas for protection of priority sand dune habitat was realised on more than 66 ha compared to 8 ha planned, which is a great success of the project. Also, a project proposal to extend the borders of the SCI Čenkov from the original 123.6 ha to 255.6 ha was prepared and approved by relevant stakeholders and authorities.

Purchasing or long-term leasing of land - within the project, 78.34 ha of land with the occurrence of salt marsh and sand dune habitats in the SCIs Mostová, Panské lúky, Kamenínske slaniská, Pavelské slanisko and Nesvadské piesky was purchased. 20.6 ha of land within SCI Pavelské slanisko and Komárňanské slanisko and 6.9 ha in the SCI Chotínske piesky were acquired by long term lease.

Restoration management of salt marshes (removal of pioneer woody species, mulching, harrowing, mowing) **was carried out on an area of 379.3 ha**. Other achievements of this action include removing of 10 illegal waste dumps and removing of illegal feeding spots for game on 4 project sites. Also, 15.6 ha of salt marsh sites, which were disturbed by ploughing before the start of the project were restored. This was done in cooperation with local farmers.

Traditional grazing was reintroduced on 8 salt marsh and 3 sand dune sites, **altogether on 350.2 ha**. At the SCIs Mostová and Pavelské slanisko salt marsh sites, grazing is secured by using a mobile herd. At other sites (salt marshes: SCIs Kamenínske slaniská, Šurianské slaniská, Bokrošské slanisko, Komárňanské slanisko, Pri Orechovom rade, and Síky; sand dunes: Marcelovské piesky, Chotínske piesky, and Čenkov), grazing was restored in cooperation with local farmers. Cows, sheep, goats, horses and water buffalos are currently grazing sites. In addition, traditional cattle breeds typical for the Pannonian region, for example, grey steppe cattle or racka sheep, were introduced by the project. They are very

suitable for restoration of abandoned grasslands by grazing and have become popular among local farmers and public – also thanks to the project.

Restoration of the salination process – creation of „saline islands“ was carried out in the project areas Kamenínske slaniská, Bokrošské slanisko, Pavelské slanisko, Panské lúky, including the Ráczovo jazierko lake, Mostová and Šurianske slaniská (part Akomáň), covering a total area of 3 ha. Within them, the top soil layer was removed at 33 selected micro-locations, which enabled surface salt precipitation from underground water. In this way, the restoration of salination process supported occurrence of rare plant species and process of halophytic habitat restoration.

Filling in the drainage channel with about 5,000 m^3 of soil over a distance of 490 m contributed to the improvement of the hydrological regime at SCI Kamenínske slaniská and Bokrošské slanisko salt marshes.

Restoration management of wind-blown sand dunes (removal of undesirable woody species, mainly black locusts and bushes, mulching, harrowing and mowing) was carried out in the project areas of Nesvadské, Chotínske and Marcelovské piesky sand dunes on a total area of 16.9 ha. At Nesvadské piesky (Líščie diery part), a 0.2 ha earth mound and at Marcelovské piesky a 1.1 ha of earth layer were removed. The latter location was also cleared of litter. These measures resulted in the uncovering of the original sand substrate, thus providing space for the movement of sand and the spreading of rare psammophytic vegetation.

Removal of an invasive woody species – the tree of heaven (*Ailanthus altissima*) – was carried out in the project areas of Čenkov (in an area of 122.78 ha) and Nesvadské piesky – Líščie diery (in an area of 0.22 ha). For the removal of the tree of heaven, the so called stem injection method was used, where a specific amount and concentration of herbicide is injected into tree trunks. Additionally, more than 4,300 dispersed fertile individuals of this woody species were removed with an aim to prevent the spreading of new diasporas.

With the goal of **informing the public and increasing their awareness** of salt marsh and sand dune habitats in the Danubian region, we have prepared:

• a webpage for the project www.perlypodunajska.sk, which uses attractive forms to provide information about project areas, activities and results as well as about the Natura 2000 network;

• information about project sites, suitable ways of farming them and project activities, all put on the web pages of villages/towns located near project areas;

• 20 information panels, placed at project sites;

• 45 posters about project sites and their conservation, which are placed in the town halls and schools in the vicinities of the project areas;

• The information brochures were printed in Slovak (4,000 copies per habitats of salt marshes and 4,000 copies per habitats of sand dunes), Hungarian (3,000 copies per habitats of salt marshes and 3,000 copies per habitats of sand dunes) and English (2,000 copies per of salt marshes and 2,000 copies per habitats of sand dunes) languages. Posters were printed in Slovak - 6,000 copies per habitats of salt marshes and 6,000 copies per habitats of sand dunes;

• excursions and field meetings – 30 excursions for 544 pupils and students, mainly from towns and villages in the vicinities of the project areas; 2 two-day (50 participants) and 4 one-day (56 participants) excursions, and 83 field meetings (altogether 298 participants) mainly for farmers and representatives from municipalities and state offices.

• 5 seminars for experts (mainly botanists, zoologists, geologists and environmentalists) with the aim of exchanging experience and knowledge from the fields of ecology and restoration of the target habitats;

• 2 methodological manuals in 3,000 copies were printed. “The world of salt marshes for young explorers” and “The world of sands for young explorers” (in Slovak and Hungarian), in the form of 74 worksheets, including animal and plant identification keys and a CD; the CD is comprised of educational tools such as a poster, cards with drawings of selected plants and animals, and a guide for teachers on how to work with the manuals;

• 28 education programmes for 588 pupils of the second level of primary education from 14 elementary schools in 13 towns/villages;

• 6 one-day education seminars for 131 teachers entitled “The pearls of the Danubian region” focused on presenting issues related to salt marshes and sand dunes; teaching tools and activities for teachers’ use in classes were presented at these seminars.

- Networking - 6 networking meetings/field trips were realised with organisations from Hungary, Czech Republic, Germany, Sweeden and Slovakia.

The After-LIFE Conservation Plan was prepared by project partners to ensure the sustainability of the conservation measures taken during the project and further improve conservation status of targeted habitats at the site level. Layman’s Report (1,000 copies) was printed at the end of the project, its electronic version is available on CDs (150 pc).

To monitor impact of restoration activities on targeted habitats, vegetation, pedological and hydrological monitoring was realised. Thanks to the project activities, several rare plant species, which were on the brink of extinction in Slovakia, returned to these salt marshes; for example, trefoil (*Trifolium angulatum)* and Teasel clover *(Trifolium retusum)* in the location of Kamenínske slaniská, or *Crypsis aculeata* in the Panské lúky location. In 2012, fewer than 50 specimens of the latter species grew on the site, this being its last population in Slovakia. Now, there are hundreds of them growing here. Threebract loosestrife *(Lythrum tribracteatum),* a rare halophytic plant, was discovered growing again at the Pavelské slanisko salt marsh. Typical populations of salt marshes also responded positively to grazing – areas dominated by the rare species *Camphorosma annua,* which grows in “saline eyes”, have expanded, and community of *Artemisio- Festucetum pseudovinae*, is spreading as well. At most locations where top soil layers were removed, an increased concentration of salts was noticed on the surface. This is one of the reasons that rare halophyte species have begun spreading here: Saltmarsh goosefoot *(Chenopodium chenopodioides),* Grassleaf orache *(Atriplex littoralis), Plantago tenuiflora,* Swamp pricklegrass *(Heleochloa schoenoides)*, and many others.
In the area of sand dunes, the abundance of rare psammophytic, competitively weak species has significantly increased, including Sand catchfly (*Silene conica*), *Kochia laniflora* and French Psyllium (*Plantago arenaria*), and Puncturevine (*Tribulus terrestris*), a typical species of sands, has begun spreading as well.

3. Introduction

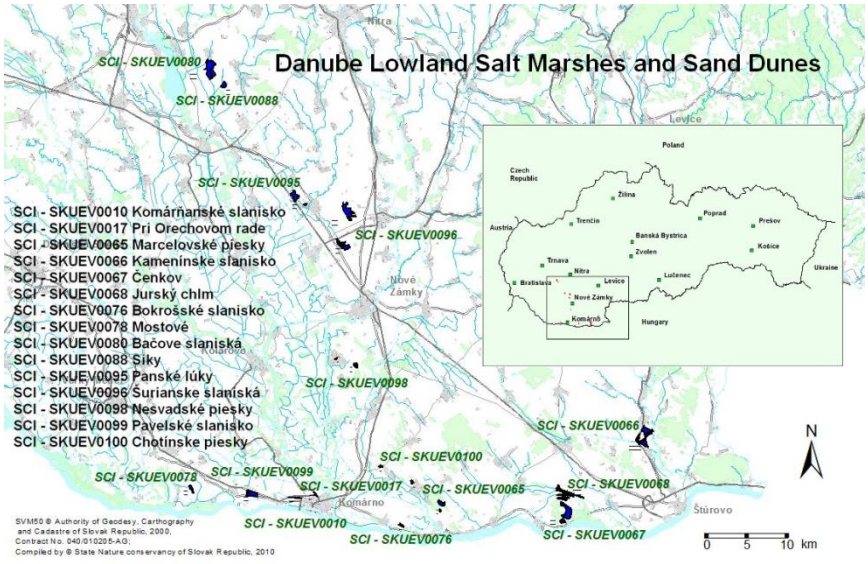
Salt marshes of the Danube Lowland comprised about 8,300 ha in the first half of the last century. By 2004, their total area had decreased to about 500 ha. Most of them were damaged by draining, ploughing, foresting or growing over, due to the cessation of their use in farming. In the last fifty years, almost 95% of the salt marshes in this region have vanished. Inland sand dunes on calcareous substrate are small isolated sites surrounded by intensively farmed land. There were many factors endangering their existence, the occurrence and spread of invasive plant species and weed species being among the most serious. The spread of invasive species was connected with the cessation of traditional uses of these habitats, mainly for grazing.

Currently, only fragments of these habitats have been preserved here, and they are protected as Sites of Community Interest within the Natura 2000 network. The project was implemented in 15 Site of Community Interest (11 salt marsh locations and 4 sand dune locations), which are situated in the districts of Nové Zámky, Komárno and Šaľa.

In response to this negative trend, DAPHNE – Institute of Applied Ecology created partnership with the State Nature Conservancy of the Slovak Republic (SNC) and Regional Association for Nature Conservation and Sustainable Development (BROZ) (altogether Project Beneficiaries) and in 2011 requested financing for the project "Restoration of Endemic Pannonic Salt Marshes and Sand Dunes in Southern Slovakia" through LIFE+ - Financial Instrument for the Environment of the EU, and later, also from the Ministry of Environment. The project started on 01/09/2011 and lasted 70 months, until 30/06/2017.

The project area consisted of 15 SCIs (sub-sites) as follows:

SKUEV 0010 Komárňanské slanisko
SKUEV 0017 Pri Orechovom rade
SKUEV 0065 Marcelovské piesky
SKUEV 0066 Kamenínske slaniská
SKUEV 0067 Čenkov
SKUEV 0068 Jurský Chlm
SKUEV 0076 Bokrošské slanisko
SKUEV 0078 Mostová
SKUEV 0080 Juhászove slance (old name Bačove slaniská)
SKUEV 0088 Síky
SKUEV 0095 Panské lúky
SKUEV 0096 Šurianske slaniská
SKUEV 0098 Nesvadské piesky
SKUEV 0099 Pavelské slanisko
SKUEV 0100 Chotínske piesky



Habitat types and/or species targeted

Salt marshes and sand dunes are hosting 5 priority habitats of European Union, which are bearing numerous threatened plant and animal species. Due to limited geographical distribution, they belong to the most threatened European communities.

Salt marshes habitats:

1340* Inland salt meadows

1530* Pannonic salt steppes and salt marshes

Sand dune habitats:

6260* Pannonic sand steppes

6120* Xeric sand calcareous grasslands

91N0* Pannonic inland sand dune thicket (*Junipero-Populetum albae*)

The main conservation issues being targeted

Project activities respond to wide range of conservation problems of project sites:

1. Abandonment of traditional management.
2. Drainage and lowering of the groundwater level.
3. Invasion of non-native species on sand dunes.
4. Afforestation of sand dunes.
5. Insufficient scientific knowledge on the processes of salinization and hydrological regime in relation to restoration methods of targeted salt marshes.
6. Insufficient personnel, technical and institutional capacities for systematic management of targeted habitats.
7. Lack of public awareness on importance of the protection of sand dunes and salt marshes.

Socio-economic context

The targeted project sites are fragmented and scattered within an intensely managed arable agricultural land. Natural habitats have diminished as a result of forest clearance, drainage, the ploughing of meadows and the use of pesticides since the 19th century. There was low awareness about natural remnants of ecosystems as well as about protected areas. Original extensive farming practices were almost lost.

Good cooperation with municipalities, farmers and authorities was established, creating significant socio-economic benefits and positive promotion of nature conservation actions. Grazing was re-established on 11 project sites. Motivation of local farmers was secured by project investment into grazing infrastructure and animals. It will attract further financing by possible use of agri-environmental incentives and secure additional jobs and finances from extensive farming. On the other hand, it attracts attention of other farmers and communities which have expressed interest to create common pastures. Hence, grazing can become an effective way to raise the attractiveness of the settlement´s surrounding, return to tradition, while increasing the biodiversity of nature. Also, marginalised groups of inhabitants (e.g. Romas, long-term unemployed or people with lower education) can find sustainable and long-term jobs by taking care of the animals. By restoring ecosystem services, this approach can make village communities more self-sufficient. This is especially important in more remote regions.

Expected longer term results

- Favourable conservation status of targeted habitats will be improved on 15 SCIs.
- Restoration management applied on area of 379.3 ha of salt marshes and 16.9 ha of sand dunes has created the conditions for their sustainable use. Traditional grazing was reintroduced on 8 salt marsh and 3 sand dune sites, altogether on 350.2 ha. Motivation of local farmers to continue with regular management was secured by project investment into grazing infrastructure and animals.
- Water regime was improved on SCI Kamenínske slaniská by filling-in of drainage ditch on 490 meters. Restoration of the salination process by the top soil removal was realised on 3 ha of salt marshes on 6 project sites. The conditions for the restoration and spreading of halophytic species and salt marshes habitats have been created.

- Alien invasive tree species *Ailanthus altissima* was eradicated from the area of 123 ha, using very efficient method of chemical eradication by the stem injection. Using of this method became mandatory on the national scale, according to the Regulation of the Ministry of Environment No. 24/2003 Coll, which was based on the experience gained from the project.
- Comprehensive Information and Monitoring System (CIMS) creates a framework to inform the involved parties, offices and organizations as a tool for preventive conservation of species and habitats of European interest. Monitoring polygons on the project sites were established in 2013 – 2015 and regular monitoring of habitats and threats for these habitats on project sites will be realised within CIMS, which is managed by the State Nature Conservancy. Monitoring data represent the basis for the development of reports on the status of species and habitats of European interest according to Art. 17 of the Habitats Directive (Reporting).
- Significantly increased knowledge on the ecological and management requirements of targeted habitats and the effectiveness of the key conservation actions for the habitat conservation.
- The project contributed to the strengthening of cooperation between governmental nature conservation authorities, environmental non-governmental organisations, stakeholders and local municipalities and communities concerning management and protection of targeted priority habitats.

4. Administrative part

4.1 Description of the management system

The **Inception phase** started on 01/09/2011 and ended on 30/05/2012 with submitting the Inception Report. The inception report covered period of 5 months of project implementation. Official project start date was 1/9/2011; the actual start date was one month later.
Partnership agreements were signed on 4/11/2011 with BROZ and on 6/11/2012 with SNC. Amendment with BROZ was signed on 30/11/2011. Amendment concerned bank account, because in the contract was accidentally given a wrong account number. The agreements contained financial plan and timetable with exact stated proportion of the EC contribution. Associated beneficiaries were obliged to send technical and financial reports to the project coordinating beneficiary every six months with copies of all accounting documents.
During inception phase the coordinating beneficiary project management team was established, consisting of the project manager, project manager assistant, financial manager and other technical positions. Technical team of the project partners was established as well. Several internal meetings were organized with SNC focused on project planning. Project was organized by headquarters of SNC, on the local level was implemented by the regional office of SNC - the Dunajské luhy Protected Landscape Area Administration. The project activities were launched since beginning of 2012.
The partnership agreements were attached as IR AnnexE1_1 (agreement with SNC) and IR AnnexE1_2 (agreement with BOZ) were delivered in Inception report.

The **Implementation phase** followed since June 2012 and was finished at the end of the project in June 2017. During this phase the main focus was given to the implementation of

the project actions A (preparatory actions), B (land purchase), C (conservation actions) and D (dissemination and public awareness actions). It also included E actions – project management, reporting and monitoring. Detailed information about the project progress and activities carried out in this phase can be found in the PR1 submitted in November 2013, PR2 submitted in July 2015, Mid term report submitted in January 2016 a PR3 submitted in November 2016.

Management system

The coordinating beneficiary DAPHNE – Institute of Applied Ecology was responsible for the whole project management, communication and reporting. In the frame of this regular meetings with partners took place to discuss and solve particular problems. DAPHNE established a good communication base within the project partners with aim to share the information about fulfilling of particular actions. Project management team also attended many meetings with municipality representatives, stakeholders, key personnel of organizations and state institutions to communicate all project activities directly in the project region with regional interests groups. Financial manager supervised fluent money spending by associated beneficiaries and communicated smoothly with accountants of project associated beneficiaries.

Project Steering Committee had yearly meetings, as planned in the project document. In the minutes from SC meeting held on 4 December 2012 it was agreed, that SC meetings will be organised twice a year. It proved to be unrealistic and agreed on the next meeting, that yearly periodicity is sufficient. Members of the SC have been nominated by associated beneficiaries and institutions and organizations within the project area before the first meeting. There were 9 members of the Steering Committee, including 2 representatives of the MoE, one from the Department of Nature and Landscape Protection and one from Department of Environmental Program and Projects. The last meeting of the project Steering Committee was organised within the final project conference organised on 31st May, where the complex results of the project were presented. The main topic of the discussion on SC meeting was the finalization and approval process of the management plans.

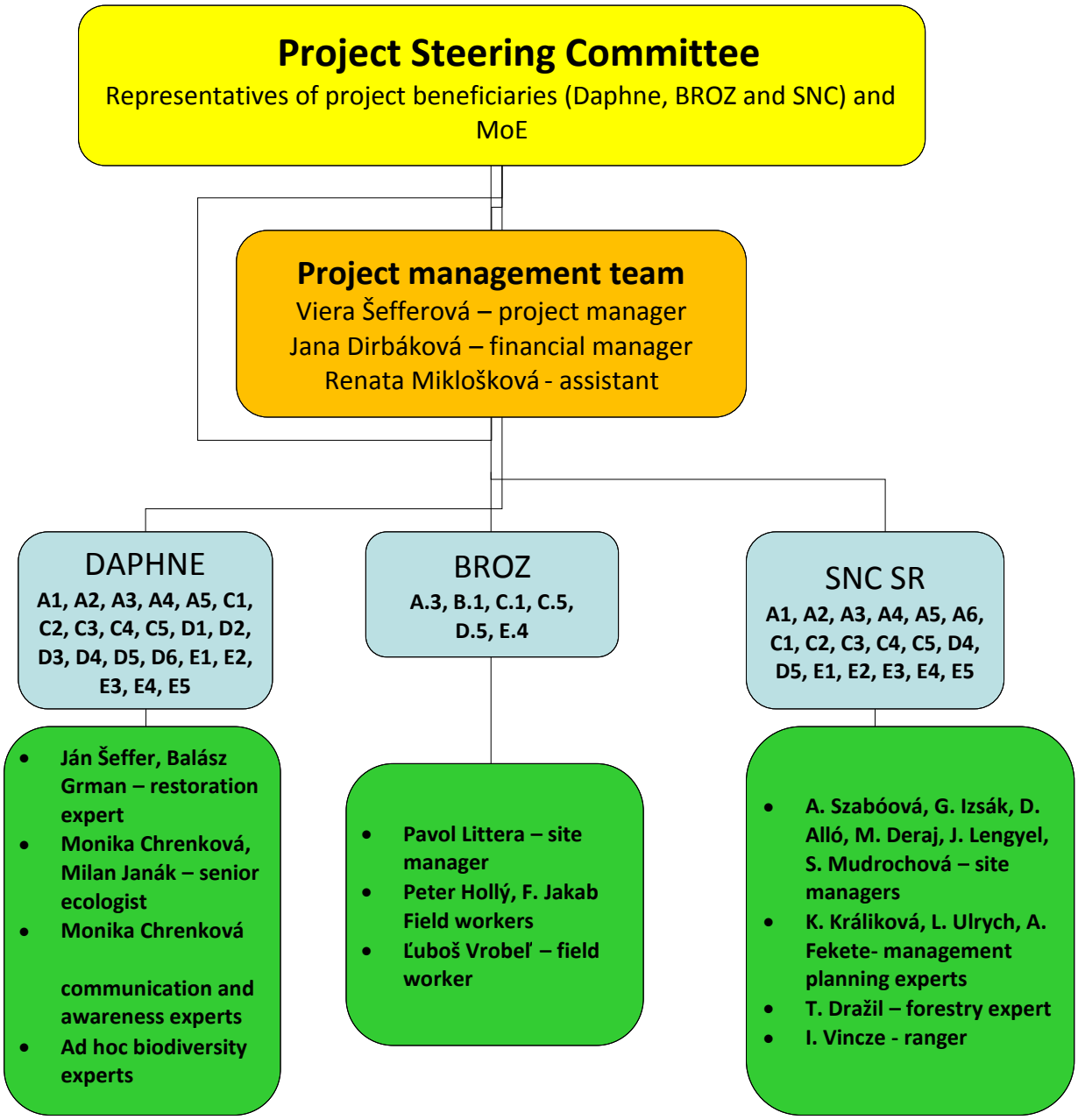
Description of changes due to amendments to the Grant Agreement

In the process of preparation of partnership agreements, clerical error in budget tables was found. There was a wrong calculation of financial sources between project partners. Amendment No. 1 to grant agreement between EC and Daphne IAE was signed on 3rd October 2011.

As project received national co-financing from the Ministry of Environment, request for modification of the grant agreement with adjusted FC and FA forms was prepared. National co-financing was by the European Commission accepted via signing Amendment No. 2 to the grant agreement in October 2014.

In accordance with recommendation of consideration of the project prolongation (Ares(2016)1402217), Amendment No. 3 was approved on 23rd September 2016 (ARES(2016)5532344). The project has been extended till the end of June 2017 and budget changes in the category of external assistance were approved.

Organigramme of the project team and the current project management structure



4.2 Evaluation of the management system

Meetings of project team were organised ad-hoc according to current needs of the project activities which had to be discussed in the field and/or in the office. Meetings with stakeholders and individual experts were held on a regular basis. Regular electronic communications was realised between the project manager and the project team.

Each beneficiary was responsible for the management of own activities and project team, including technical and financial reporting. Beneficiaries were experienced NGOs and State institution not only in their field of expertise but also in project management with established internal accounting system to keep all project expenditures transparent and according to the requirements. The project was supervised by Steering Committee, which was designed to deal with systematic matters in the project implementation. This system has proven effective.

However, there were delays with implementation of two activities. Delay of Action C4 was caused by pending public procurement procedure. Despite the complicated beginning of this activity, significant results were achieved. It was eradicated 123 ha of invasive tree species *Ailanthus altissima* ha, using very efficient method of chemical eradication by the stem injection. The original project plan was to eradicate 60 ha only.

Complications concerning the implementation of the Action A5 were caused by changes of the national legislation. Delay in delivering the plans was caused by the fact, that during elaboration of management plans new Act No. 543/2003 Coll. on Nature and Landscape Protection as amended came into force and various changes in the structures of documents related to the biodiversity conservation and management have been set up. This fact caused the need for additional time for incorporation of these changes into already elaborated parts of the management plans.

Based on the MoE recommendations, before the management plans were submitted to the relevant authority for official approval, internal reviewing and pre-negotiation process on management measures conducted by SNC staff with the land owners and users was done and reasonable comments were incorporated into documentation.

Subsequently, Management Plans were sent to the relevant authority (District Office Nitra) for approval. Approval of the submitted management plans was beyond control of project beneficiaries and it is a problem on national scale. There are no deadlines in the law for the approval process. This has caused delays in the delivery of the Final Report.

Communication with the European Commission and Monitoring team was done by Daphne. Scheduled reports to the European Commission and National Authority were prepared by coordinating beneficiary based on beneficiaries' Reports on actions carried out and budget spending submitted twice a year.

Project reports

Submitted reports	reporting period:
Inception report:	1/9/2011 to 30/5/2012
Progress report n. 1:	30/5/2012 to 30/11/2013
Progress report n. 2:	30/11/2013 to 30/04/2015
Mid term report	01/09/2011 to 30/09/2015
Progress report n. 3:	01/10/2015 to 31/08/2016

Monitoring missions

Nominated external monitor was Mr. Peter Bezák, replaced by Mr. Andrej Bača in 2013. Each Monitoring mission was divided in two parts – administrative and technical. Relevant Associated beneficiaries were present on both parts of the mission.

5. Technical part

5.1. Technical progress, per task

Actions A.: Preparatory actions, elaboration of management plans and/or of action plans

Action A.1: Elaboration of study on eco-hydrological restoration of salt marshes (DAPHNE)

Description and outputs

The Study on ecohydrological restoration of nine salt marshes was elaborated. It includes several methods for restoration of degraded salt marshes. 1) removal of top soil in order to start colonisation by salt tolerant species in more suitable soil condition; 2) compaction of top soil layer for increasing of capillary forces, which help bring salt water closer to surface and 3) increasing of water table by underground clay barrier. Considerable effort was developed to obtain information on the project site in terms of pedology, hydrology, water and land management changes.

It was proposed to restore more than 40 micro-sites of size 20x20 m by top soil removal – the soil layer of thickness about 20 cm will be removed and soil will be compacted. Identification of potential restoration areas has been done on base of salt tolerant indicator species. All sites were mapped by GPS. The increasing of water table by construction of underground clay barrier on two sites (Kameninske slaniská and Bokros) was proposed. In both cases; the sites have been influenced by deep drainage canal. Classical solutions for increasing of water table (damming or filling) were not feasible, because it could negatively impact large area of arable fields. Construction of the underground clay barrier along the canal could influence only one side of drainage canal adjacent to protected areas. The approaches defined in the study served as basis for restoration of salt marshes on project sites (Action C.3). Study on ecohydrological restoration of salt marshes was attached to the **PR1 as Annex A1**.

Problems and their solutions/Modifications

As justified in the Inception report, hydrological monitoring was realised only on the sites with planned clay barrier to monitor its impact and not on all project sites.

Accordance with the timetable

Implementation of this activity was extended about 6 months, till June 2013.

ACTION A.2: Elaboration of study on ecological restoration of sand dunes (DAPHNE)

Description and outputs

Within the theoretical part of a study, we focused on obtaining information on the best and most effective ways to eliminate invasive species from the literature or by contacting the experts who have practical experience. We focused on collecting information on methods of

eradication of invasive species *Ailanthus altissima* and *Robinia pseudoacacia* with critical emphasis on the first one. Some of the control methods suggested including foliar spray, basal bark application, cut-stump herbicide application, hack-and-squirt method, and mechanical control. One consideration when selecting a treatment method is trying to control the remarkable resprout ability of the tree of heaven.

The most effective technique is the lance injection system. Application involves herbicide capsule injection into the cambium layer of the tree by a mechanically activated lance. The herbicide is stored in brass capsules and is released when a capsule is injected into the stem by the lance. The manufacturer recommends spacing the capsules at 7.5 cm intervals around the circumference on the stem, but it is unknown if this application rate is appropriate for *A. altissima*. This injection system provides an environmentally safe and direct approach to removing *A. altissima*.

The most impacted area was SCI Čenkov, which was mapped in detail for distribution of invasive species, especially *A. altissima*. Restoration of other project sites included also activities for eradication of *Robinia pseudoacacia*. The approaches defined in the study served as a basis for restoration of sand dunes on project sites (Action C.2 and C.4). Study on ecological restoration of sand dunes was attached to the **PR1 as Annex A2**.

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
Implementation of this activity was extended about 6 months, till June 2013.

ACTION A.3: Elaboration of expert study on restoration and management of halophytic and sand habitats by grazing (BROZ)

Description and outputs

The study contains analysis of conditions and recommendations for restoration of grazing on each project site. These included their historical and present use, analysis of ownership structure and stakeholder groups involved, occurrence of target habitats and species, for which the grazing management should be optimised. The most suitable animal breeds for restoration of salt marshes and psamophytic habitats were described, as well as recommendations for maintaining proper care for animals (veterinary needs, diet and dietary supplements, wintering etc.), grazing regime on particular sites and recommended solutions for creating infrastructure for grazing. Optimal setting of restoration management in order to prepare the sites for grazing was discussed too. The approaches defined in the study served as basis for restoration of target habitats on project sites by grazing (Action C.5). Study on habitats restoration and management by grazing was elaborated and attached to the **PR1 as Annex A3**.

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
The study was finalised as planned.

ACTION A.4: Technical documentation for restoration actions and construction of technical objects (DAPHNE)

Description and outputs

After finalisation of ecohydrological study (Action A.1), the need for additional information on soil layers and aquifers for 2 sites (SCI Kamenínske slaniská and SCI Bokrošské slanisko) with planned construction of underground clay barrier appeared. Construction of underground clay barriers along the canal, which will influence only one side of drainage canal adjacent to protected areas, was tested in the field by drilling of exploratory wells and testing of efficiency of such approach based on gained additional information on soil layers and aquifers (**PR2 AnnexA4_1, AnnexA4_2)**.

In the case of SCI Bokrošské slanisko, it was found out that level of underground water is very low, up to 4 m and soil composition, containing also permeable sands is not suitable to secure sufficient increase of water table. The construction of clay barrier in depth more than 4 m should be very expensive and probability of good restoration effect is low.

The envisaged implementation of an underground clay barrier along the drainage channel of SCI Kamenínske slaniská was not suitable because its trace in the direction of groundwater flow. The feasibility of new proposed restoration action – filling of drainage canal was negotiated with local stakeholders, mainly local municipality in Kamenin village. After already very successful cooperation within project, approval from local municipality to realise this restoration measure was received.

Due to extent of works – filling drainage canal with length 450 m and total volume almost 5 000 cubic metres, full construction project was developed (**MTR Annex A4**). For approval of the project was necessary to get additional statements/approvals from Ministry of Defence SR, Distribucia SPP (gasolines), Regional Monument Office Nitra, Telecommunications, Hydromeliorations etc. Filling-in of the drainage ditch was classified as removal of construction of the unknown owner. The fact that the construction has neither owner nor any manager and it was constructed on privately owned land parcels but without arranging the ownership, was discovered only during the permitting process and substantially influenced it. Due to this complicated legal status additional opinions, permits and procedural steps were necessary. However thanks to help from the respective authorities and support from Kamenín self-government (village mayor's office), the permit to remove the drainage ditch was acquired in mid April 2016 by District Office Nové Zámky. The following construction works were completed in May 2016.

Problems and their solutions/Modifications

No problems occurred.

Accordance with the timetable

The original plan to finalise activity was October 2013. Implementation of this activity was extended till July 2014 and was reported as finalised in the PR2. However, due to justification above, following construction works were completed in May 2016.

ACTION A.5: Elaboration of Management Plans for project sites (SNC)

Description and outputs

At the beginning of project implementation, scientific articles and relevant data were collected from experts who studied species and habitats at the project sites to obtain current and relevant scientific data for development of MPs. Within the project, habitat inventory was undertaken as a baseline for elaboration of vegetation maps and delineation of management units.

Methodological discussion, meetings on content and approach to management planning process were undertaken to be able to harmonize preparation of all 15 MPs. Twenty two meetings with relevant stakeholders were organized with the aim to set up appropriate management measures at project sites. Project activities and proposed management measures were discussed with stakeholders and incorporated to MPs.

The MPs were elaborated in accordance with attachment number 18 according to Slovak executive decree number 24/2003, which contains also the prescribed structure of the MPs. On June 16, 2014 three new regulations which amended the Act No. 543/2002 on Nature and Landscape protection and the Order of MoE No. 24/2003 Coll. came into force. It includes a new concept of elaboration of the MPs which had to be considered during preparation of management plans. Draft versions of MP for project sites were attached to the **PR2 as Annexes A5-1 – A5_15**.

All MPs were submitted to the relevant authority (District Office in Nitra) for the approval. The following table provides an overview of management plans with reference to the Annexes where for each site the final version of the management plan and the approval document can be found.

MP for SCI Chotínske piesky – AnnexA5_1.1	Approved on 20 December 2016 – AnnexA5_1.2
MP for SCI Komárňanské slanisko – AnnexA5_2.1	Approved on 26 April 2017 – AnnexA5_2.2
MP for SCI Pavelské slanisko – AnnexA5_3.1	Approved on 31 May 2017– AnnexA5_3.2
PM for SCI Čenkov – AnnexA5_4.1	Approved on 8 June 2017 – AnnexA5_4.2
MP for SCI Šurianske slaniská – AnnexA5_5.1	Approved on 6 June 2017– AnnexA5_5.2
MP for SCI Pri Orechovom rade – AnnexA5_6.1	Approved on 17 July 2017– AnnexA5_6.2
MP for SCI Mostová – AnnexA5_7.1	Approved on 9 August 2017– AnnexA5_7.2
MP for SCI Nesvadské piesky – AnnexA5_8.1	Approved on 23 October 2017– AnnexA5_8.2
MP for SCI Juháczove slance – AnnexA5_9.1	Approved on 11 December 2017– AnnexA5_9.2
MP for SCI Kamenínske slaniská – AnnexA5_10.1	Approved on 20 December 2017– AnnexA5_10.2
MP for SCI Síky – AnnexA5_11.1	Approved on 30 January 2018 – AnnexA5_11.2
MP for SCI Panské lúky – AnnexA5_12.1	Approved on 7 March 2018 – AnnexA5_12.2
MP for SCI Jurský Chlm – AnnexA5_13.1	Approved on 8 March 2018 - – AnnexA5_13.2
MP for SCI Bokrošské slanisko – AnnexA5_14.1	Approved on 13 March 2018 – AnnexA5_14.2
MP for SCI Marcelovské piesky – AnnexA5_15.1	Approved on 23 February 2018 – AnnexA5_15.2

During the elaboration of MP for SCI Čenkov special attention was given to the occurrences of species of European interest (*Colchicum arenarium, Iris arenaria*) and habitats 6260* and 91N0*. In compliance with conclusions of the Pannonian biogeographical seminar a boundary extension of SCI Čenkov from the original 123.6 ha to 255.6 ha was incorporated into MP based on intensive communication and approval by foresters (within Action A.6). The enlargement of SCI Čenkov was proposed to the European Commission on 30th October 2017 as new SCI (SKUEV2067) with area 176.34 ha. It was published as Legislative Measure of the Ministry of the Environment of the Slovak Republic on 7 December 2017 no. 1/2017 amending the Decree of the Ministry of the Environment of the Slovak Republic of 14 July 2004 no. 3/2004-5.1, issuing a national list of territories of European significance (**FR AnnexA5_16**). At the same time the borders of existing SCI Čenkov (SKUEV0067) were adapted according recent habitat mapping realised within the project with area 79.240 ha (**FR AnnexA5_17**). Total area of both SCIs at Čenkov (SKUEV0067 and SKUEV2067 together) is 255.6 ha. Those are relevant documents confirming the extension of SCI Čenkov as as you requested in two letters: Ares(2014)525570 - 27/02/2014 ANNEX, point 5 and Ares(2013)2770816 - 29/07/2013 ANNEX, point 1.

Problems and their solutions/Modifications

In 2014 three new regulations which amended the Act No. 543/2002 on Nature and Landscape protection and the Order of MoE No. 24/2003 Coll. came into force. It included a new concept of elaboration of the MPs which had to be considered. Moreover before the MPs were submitted to the relevant authority for official approval, internal reviewing and pre-negotiation process conducted by SNC staff with the land owners and land users on management measures was necessary and relevant comments were needed to incorporate into MPs. Subsequently, Management Plans were sent to the relevant authority (District Office Nitra) for approval. Approval of the submitted management plans was beyond control of project beneficiaries, as there are no deadlines in the law for the approval process. This has caused delays in the delivery of the Final Report.

Accordance with the timetable

Final versions of management plans are being submitted within the Final Report, as approved in the Commission letter received after Midterm report Ares(2016)1402217 - 21/03/2016 ANNEX, Technical issues: Par. 1.

Annexes of the action

FR AnnexA5_1.1 MP for the SCI Chotínske piesky
FR AnnexA5_1.2 Approval document for the SCI Chotínske piesky
FR AnnexA5_2.1 MP for the SCI Komárňanské slanisko
FR AnnexA5_2.2 Approval document for the SCI Komárňanské slanisko
FR AnnexA5_3.1 MP for the SCI Pavelské slanisko
FR AnnexA5_3.2 Approval document for the SCI Pavelské slanisko
FR AnnexA5_4.1 PM for the SCI Čenkov
FR AnnexA5_4.2 Approval document for the SCI Čenkov
FR AnnexA5_5.1 MP for the SCI Šurianske slaniská
FR AnnexA5_5.2 Approval document for the SCI Šurianske slaniská
FR AnnexA5_6.1 MP for the SCI Pri Orechovom rade
FR AnnexA5_6.2 Approval document for the SCI Pri Orechovom rade
FR AnnexA5_7.1 MP for the SCI Mostová

FR AnnexA5_7.2 Approval document for the SCI Mostová
FR AnnexA5_8.1 MP for the SCI Nesvadské piesky
FR AnnexA5_8.2 Approval document for the SCI Nesvadské piesky
FR AnnexA5_9.1 MP for the SCI Juháczove slance
FR AnnexA5_9.2 Approval document for the SCI Juháczove slance
FR AnnexA5_10.1 MP for the SCI Kamenínske slaniská
FR AnnexA5_10.2 Approval document for the SCI Kamenínske slaniská
FR AnnexA5_11.1 MP for the SCI Síky
FR AnnexA5_11.2 Approval document for the SCI Síky
FR AnnexA5_12.1 MP for the SCI Panské lúky
FR AnnexA5_12.2 Approval document for the SCI Panské lúky
FR AnnexA5_13.1 MP for the SCI Jurský Chlm
FR AnnexA5_13.2 Approval document for the SCI Jurský Chlm
FR AnnexA5_14.1 MP for the SCI Bokrošské slanisko
FR AnnexA5_14.2 Approval document for the SCI Bokrošské slanisko
FR AnnexA5_15.1 MP for the SCI Marcelovské piesky
FR AnnexA5_15.2 Approval document for the SCI Marcelovské piesky
FR AnnexA5_16 Legislative Measure of the MoE SR
FR AnnexA5_17 SCI Čenkov (SKUEV0067) changed borders

ACTION A.6: Integration of nature conservation objectives into forest management plans (SNC)

Description and outputs

Several meetings and field visits with the representatives of the National Forest Centre (NFC), responsible for methodological framework for elaboration of forest management plans and other relevant national and local stakeholders were undertaken, to clarify and discuss specific project requirements for nature conservation purposes.
Forest management plans (FMP) are the basic documents for management of all forests in Slovakia. Their elaboration is under the supervision of the Ministry of Agriculture and Rural Development and under the Forest Act. If some specific management in the forests within the protected areas is needed, SNC has to submit specific management requirements through the respective authorities (District Offices) in the process of the FMP recovery, which is in 10 year cycles.
Specific management requirements of the SNC for SCI Čenkov and SCI Nesvadské piesky (part Líščie diery) were developed and defined in an expert study elaborated within the project in July 2012. Based on this study, NFC elaborated within the project "Proposal of management models and fundamental principles in forest management for the area of SCI Čenkov and SCI Nesvadské piesky - part Líščie diery" as a basic for elaboration of the FMP for the period of 2014-2023. The principal and specific management requirements of the SNC were following:

- planting of native tree species for forest cultivation;
- elimination of non-native, mainly invasive species and using the native species composition;
- creation of more open forest growths with patches for survival of the forest steppe and dry grassland habitats .

The SNC has submitted official requirements for a forest management at both project sites in the process of FMPs recovery to District Office in Nitra. It was reported as **PR1 Annexes A6_5.1 – A6_5.6**, with detailed description of management needs for nature conservation purposes. The interests of nature conservation represented by the SNC were incorporated into the Reports on management, which were elaborated by producers of the FMP and approved by District Forest Office in Nitra. Forest management plans for SCIs Čenkov and Nesvadské piesky were approved by competent authorities on 25 July 2014.
A part of the FMP for SCI Čenkov was attached as **MTR Annex A6_1** (as requested by letter from 22/9/2015, ARES 3911582). It is a part called Description of forest stands and management measures. The structure of this part of the FMP is a very technical set of tables. A part dealing with the project area can be identified as ÚEV Čenkov in the tables (pages 956-958, 989-1002, 1026-1047). Defined management models and fundamental principles for forest management elaborated within the project and approved by relevant authorities were transferred to the technical document in codes with management regulations for a particular forest stand. For example, if we have forest stand with plantations of pines and native poplar species, it is in FMP as cutting of pines in cubic meters, way of felling and species which have to be planted. Only this part of the FMP is available for the SNC (thanks to a very good cooperation with foresters within the project). According to the Forest Law, the complete document is available for the forest owners and forest users only and is not available neither for SNC nor for the District Office.
A part of the FMP for SCI Nesvadské piesky was attached as **MTR Annex A6_2_1 and A6_2_1** (on page 206, number 378 there is mentioned elimination of alien species *Ailanthus altissima*).
In the case of SCIs Čenkov and Nesvadské piesky a proposal of creation of functional areas for protection of 6260* and 91N0* habitats was beyond the common cultivation of forests and it was delivered as a specific requirement of the SNC to the Forest Unit Štúrovo for SCI Čenkov and the Forest Unit Komárno for SCI Nesvadské piesky.
As it was agreed at preparatory meetings with foresters, data obtained from habitat mapping formed a base for discussion on an extension of functional areas at both project sites. Project achieved a great success in communication with foresters on forest special protection measures at these sites. In total an area of 66 ha (64.5 ha at SCI Čenkov and 1.5 ha at SCI Nesvadské piesky) was included as functional area (compared to 8 ha as planned) into the FMPs. Maps with delineation of functional areas, which are parts of the FMPs were attached as **MTR AnnexA6_3 and A6_4.**

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
Main project outputs were achieved as planned.

Actions B: Purchase/lease of land and/or compensation payments for use rights

ACTION B.1: Land purchase and/ or long-term lease of land for implementation of restoration actions and establishing the grazing management (BROZ)

Description and outputs

Land purchase: 78.34 ha of land were acquired in total within the project areas. Of this:
6.76 ha of land was acquired (by purchase) in SCI Panské lúky,
4.20 ha of land was acquired (by purchase) in SCI Nesvadské piesky,
20.29 ha of land was acquired (by purchase) in SCI Mostová,
1.58 ha of land was acquired (by purchase and land swap) in SCI Pavelské slanisko,
45.51 ha of land was acquired (by purchase and land swap) in SCI Kamenínske slaniská.
Purchasing these parcels was necessary for implementing concrete conservation actions required for restoration of target habitats on the project sites (actions C1, C2, C3 and C5).

The above mentioned concerns only land parcels located in the project areas, where concrete conservation actions of the project were implemented in order to restore the target habitats.

The overview of all land parcels under the above mentioned definition is summarized in **FR Annex B1_1** – also in response to questions raised in letter from EC no.: ARES(2014)2556371 – 01/08/2014 par. 2. The annexed table includes also other relevant details – such as project actions implemented on the respective parcels and reference to the relevant documents attached as annexes to this report (land purchase or land swap contracts, Ownership certificates, maps).

Parcels located outside of the project sites are not included in the above summary (nor FR Annex B1_1) and are not claimed.

Land lease: 27.46 ha of land were long-term leased in total. All of this is located in the project areas and NATURA 2000 sites. Of this, 20.56 ha was leased from municipality of Komárno in SCIs Pavelské slanisko (8.89 ha) and Komárňanské slanisko (11.67 ha). In SCI Chotínske piesky, 6.90 ha of land were leased from Slovak land fund – representing the complete area of the project site. As the land parcels were in all cases leased from public institutions – i.e. not private owners, the costs for land lease is not claimed by the project. However, the above mentioned land lease contracts were necessary to enable implementing the concrete conservation actions of the project and thus helped to reach the project objectives considerably. The overview of long-term leased parcels is shown in **FR Annex B1_1** - also with reference to relevant annexes (land lease contracts and maps).
Significant effort was put in to insert the clause that would assign the purchased parcels definitively to nature conservation purposes into Ownership certificates. But due to the regulations of Regional cadastral offices, this could be done only for parcels, where the sole ownership was acquired. However, the clause that the land parcels are definitively assigned to nature conservation is included in all land purchase and land swap contracts. In 2 cases – i.e. **MTR Annex B1_1** and **MTR Annex B1_2** – this was added and signed in a Supplement to

the Land purchase contract. The same applies for the clause, that in case of dissolution of BROZ (or its incapacity to manage the land in a nature friendly manner); the purchased parcels will be transferred to other NGO or legal body, primarily active in the field of nature conservation. Such clause and guarantee were also included in statutes of BROZ (**FR Annex B1_7, Art. 7**). All purchase prices are based on market terms.

Problems and their solutions/Modifications

Response to the questions raised in letter from EC no.: ARES(2014)2556371 – 01/08/2014 par. 2: In some cases, the signing the land purchase and land swap contracts was delayed due to reasons which were beyond our influence (e.g. bank lien bound to the subjected parcels, land restitutions, ongoing heritage processes, court trials, parcel rearrangement processes, the property was a subject of execution, etc.). Although we tried to urge the respective owners to solve these problems, the sales contracts could be signed only after these burdens had been overcome.

In such cases, the owners agreed with implementing the project actions on their land before signing the contract, but under the condition, that the land would be purchased (or swapped) when the administrative burdens are overcome and signing of the contract is possible. In this way, we could implement the concrete conservation actions before signing the respective contracts, so that the target habitats could be restored and the project objectives were reached.

Within the action B.1, we have approached many individual land owners for selling the land in the project area. The situation in Slovakia with land ownership is very complicated. The land parcels, even very small ones have usually many co-owners (sometimes up to hundred, sometimes there are unknown owners among them) and for the purchase we have to approach all of them. This process is largely time consuming and difficult in searching for all owners. Land ownership in Slovakia and its organization is one of the most difficult ones in Europe due to several historical reasons: Theresian heritage system – land divided to all descendants and heirs from the Austro- Hungarian era until now (from generation to generation causing further comminution of the property and increasing numbers of co-owners); change of the state borders and resettlement of inhabitants between Slovakia and Hungary in the project area in the past (during and after 2nd World War); confiscation of private property by the communist state of Czechoslovak republic and complicated long-lasting restitutions of lands back to original owners or their heirs, often still not etc.

As a result, many project sites (e.g. SCI Kamenínske slaniská, SCI Panské lúky) consist of a high number of rather small land parcels often with many co-owners. Land with the sole ownership 1/1 is rather rare and therefore more difficult and costly to be obtained. As majority of private land in project site is represented by small land parcels and with many co-owners, it is not possible to avoid such lands if we want to protect and restore certain compact area. In more cases, we were able to gain the sole ownership of the land (1/1) by progressive purchase of the ownership shares of the individual co-owners.

Due to the above mentioned, in Slovakia, the land is typically used not according to individual parcels (which are often too small for effective land management, with many owners, often unknown), but within larger land blocks, typically containing of more parcels.

The user of the given land block is usually the one who acquires the major or most significant ownership share. From the above mentioned reasons, this is typically considered for a land

block as a whole, not for each parcel separately. This is because land blocks often consist of tens of parcels (often more than 100), with many owners. In such case, it is almost impossible to reach sole or majority ownership for each parcel.
A significant effort was put to acquiring as large share as possible in the most important project areas. In the case of SCIs Kamenínske slaniská and Pavelské slanisko, BROZ has already become the dominant owner, thus effectively controlling and safeguarding the sustainable use of the restored habitats and their future management.

Even in cases where there is a minority ownership on some parcels, it has allowed us to implement the concrete conservation actions of the project on these parcels.
According to par. 139 of Act 40/1964 Coll. (civil law), which treats the use of subjects (e.g. parcels) with shared ownership, all of the co-owners are entitled to bear all rights and obligations connected with the shared property and its use. Although the decisions concerning the use of shared subject are made by the majority of ownership, when an agreement of co-owners is not reached, the decision is made by court based on a proposition of any of the co-owners. When there is a significant change of use of a shared subject (e.g. a parcel), even the owners holding a minority share can apply for a judgement made by court.
The parcels concerned are situated in Sites of community importance, where the project habitats are a subject of protection. Any change of use of the subjected parcels, that would cause harm or destruction of these habitats is considered significant. When such activity would be proposed by a majority owner, even from the position of a minority owner we are entitled to apply for a judgement made by court.
In all Sites of community importance, there is preliminary nature protection in practice, based on Par. 27, Art. 7 of Act. 543/2002 Coll., which is equivalent to the degree of protection of valid protected area. Hence, if such situation would arise (if there would be a risk of harming or destruction of project habitat situated in SCI), the judgement of the court must not be contradictory to the valid law (Act 543/2002) and therefore should guarantee the preservation of the habitat and prohibit activities or plans that would lead to its harm or destruction. In this way, the activities which would lead to harm or destruction of target habitats in project areas can be prevented, even when we hold a minority ownership share on a given parcel.
The target habitats were also assigned with a relatively high societal value. For example the societal value of habitat 1340* is 73.69 euro per m^2 (Annex 1 to Regulation of Ministry of Environment no. 24/2003). Other project habitats were assigned also with relatively high societal values: 1530* = 247.95 euro/m^2; 6120* = 77.67 euro/m^2; 6260* = 22.57 euro/m^2; 91N0* = 62.07 euro/m^2. If anyone would cause harm or destruction of these habitats, this would be a subject of fine equal to the societal value lost on the given area (calculated as area of habitat destroyed or harmed multiplied by above mentioned index for given habitat). Moreover, when the habitats are destroyed inside the protected areas or when the habitats host protected plant or animal species, this fine is increased by 100% (Par. 38, Art. 3, Regulation of Ministry of Environment no. 24/2003).
Since the resulting fine is considerably high, this works as a relatively effective way of preventing activities, which would result in harm or destruction of project habitats.
The above mentioned issues were discussed in more detail within Progress report 3 and these guarantees for definitive assigning to nature conservation were accepted for land

parcels, where only a minor ownership could be reached by the EC (Ares(2017)1195453 - 07/03/2017, point 4).
A significant majority of land purchased within the project was with sole or majority ownership (i.e. with ownership share on land parcels being 1/2 up to 1/1) – 94.1 % (73.6 ha). Only 5.9 % (4.6 ha) of land was purchased in land parcels, where BROZ has achieved only minority ownership (i.e. lower than 1/2). However, these are part of larger land use blocks, where BROZ is already the major land owner and in protected areas, which provide sufficient guarantee for preserving the results achieved by the project on long term (see also communication with EC: ARES (2017) 1195453 – 07/03/2017, par. 4).

As requested in ARES (2017) 1195453 – 07/03/2017, par. 5, maps with location of all purchased and leased parcels and related SCI borders can be found in **FR Annex B1_3.**

Answers to questions raised in letters from EC no.: ARES(2014)525578 – 27/02/2014 par. 7; and ARES(2017)1195453 – 07/03/2017, par. 6.
In SCI Panské lúky, a land parcel 3361/5 was purchased, containing a stand of hybrid poplars on a significant part of its area in 2012. However, due to high salt content, most of the poplars have already died out and have fallen apart. Concrete conservation actions C1 and C3 were implemented on the parcel to restore the target habitats: within action C1, invasive trees (esp. *Ailanthus altissima*) as well as other pioneer trees and shrubs were removed in 9/2013 with sprouts being removed in the subsequent years. This allowed us to effectively control the invasion of this IAS species and stop its future spreading to other valuable parts of the site (see FR Annex C1_1 – page 14 for photodocumentation).
The purchase of this parcel was crucial also for implementing the project action C3 – restoring the target habitats by small scale removal of upper soil layer. One of the conditions of the land user was not to place the plots of small scale depressions into the middle of grassland parts of the site, since it would make regular mowing of the site more complicated. Due to this, 3 of 4 small scale depressions to be created in the northern fragment of SCI Panské lúky were placed on this parcel (see figure in **FR Annex B1_6**).
The results achieved on these plots were outstanding, with rare halophytes such as *Atriplex litoralis, Plantago tenuiflora, Plantago maritima* and *Centaurium uliginosum* ssp. *littorale* occurring in significant numbers, with a potential to spread to the neighbouring parts of the site (as seen also during field visit on 29/6/2017). Therefore, the contribution of purchasing this parcel to reaching the project objectives in restoration of the target habitats can be considered as significant.

Accordance with the timetable
Due the reasons outline above - described in more detail in written communication with EC (letters from 20/3/2014, 17/4/2014 and 24/6/2014), the buying/leasing of parcels in such cases was prolonged after December 2014 (ARES 2556371) - until the end of the project.

Annexes of the action
FR Annex B1_1: Overview of all land parcels acquired within the project. It is provided as both, PDF and excel file.
FR Annex B1_2: Ownership certificates
FR Annex B1_3: Overview maps of location of land parcels acquired within the project – with relevance to the project sites (inside are annexes B1_21 – B1_27).

FR Annex B1_4 Land purchase and land swap contracts (inside are annexes B1_5 – B1_20)
FR Annex B1_5: BROZ Statutes
FR Annex B1_6: Location of plots restored by action C3 within northern fragment of SCI Panské lúky.
FR Annex B1_7 Shapefiles with data for Land Purchase Database in electronic form only

Relevant annexes attached with previous project reports
MTR Annex B1_1: Land purchase contract – amended to meet points raised in Ares (2015)3911582 - 22/09/2015
MTR Annex B1_2: Land purchase contract – amended to meet points raised in Ares (2015)3911582 - 22/09/2015
MTR Annex B1_3: Land purchase contract
MTR Annex B1_4: Land purchase contract
MTR Annex B1_8: Land lease contract

Actions C: Concrete conservation actions

Action C.1: Restoration management of salt marshes (BROZ)

Description and outputs

Restoration management was carried out on a total area of 379.3 ha – on 9 sites of salt marshes. Where necessary (e.g. when suppressing invasive or dominant plants, mowing), the restoration management was carried out repeatedly (and often in combination with grazing).
Activities on project sites were as follows:
SCI Mostová –22.5 ha
- The whole site was mowed every year since the start of the project, with the biomass being removed (after being mowed, it was grazed with the mobile herd). Pioneer shrubs and trees were partly removed (part of these were left standing to provide shade for grazing animals).

SCI Pavelské slanisko – 18.5 ha
- Removing of shrubs and invasive trees (15.5 ha).
- Shrubs and trees were removed also in the former clay pit in the western part of the site (cca 2.5 ha) – in order to restore grazed and periodically flooded shallow banks (in cooperation with action C.3), which are a habitat for several critically endangered halophytic species.
- Mowing was applied in the northern fragment of the site (2.4 ha) in 2013 and 2014, the biomass was removed. The most valuable parts (0.5 ha) were mowed manually after mulching in 2012.
- Thorny and poisonous herbs such as *Cirsium* sp., *Datura stramonium* and *Hyoscyamus niger* were removed manually, when possible also with the root.

SCI Komárňanské slanisko – 14.5 ha.
- Shrubs and trees were removed on 8 ha in the western part of the site. Solitary trees and shrubs were left standing to provide shade for grazing animals.
- The eastern and central part of the site was mulched (12.2 ha) and mowing was applied in the subsequent seasons (from 2017, grazing was restored on the whole site).

SCI Pri Orechovom rade – 1.7 ha.

- Invasive trees *Eleagnus angustifolia, Robinia psedoaccacia* were removed. *Solidago* sp., *Fallopia* sp. and *Lycium barbarum* were removed by a combined treatment of mowing and application of herbicide on the young sprouts, as well as mulching.
- Resprouting of shrubs and trees is controlled by mulching (and grazing)

Removing of invasive plants in the eastern part of the site was carried out in cooperation with SNC and Railway Company of Slovakia, who, as an owner of these parcels agreed also on continuing of removing of invasive species.

SCI Bokrošské slanisko – 10 ha

- Shrubs and invasive trees were removed almost on the whole site (10 ha). Resprouting was suppressed by mulching (and grazing). Patches with *Solidago* sp. were mulched and hand mown as well.

SCI Kamenínske slaniská –114.9 ha.

- Removing of pioneer and invasive trees and shrubs (altogether on 77.9 ha).
- Mulching (on 40 ha), harrowing and restoration of mowing (26.5 ha) – realised in cooperation with a local farmer.

SCI Šurianské slaniská – 101.2 ha

- Mowing was restored in cooperation with Mr. Raučina, a local famer on 54 ha in the northern part of the SCI. In some parts, the anthills were levelled down (to allow sustainable use).
- Harrowing was applied on 47.9 ha of the site to promote rejuvenation of species typical for target habitats.
- Invasive trees (*Ailanthus altissima, Eleagnus angustifolia*) were removed on 20 ha by stem injection method in the northern part of the site.

SCI Panské lúky – 64 ha.

- Invasive trees (*Ailanthus altissima, Robinia pseudoaccacia*) and pioneer shrubs were removed in the southwestern part of the part Panské lúky (on 1.7 ha).
- In part Ráczovo jazero, the anthills were levelled down and mowing was restored in cooperation with a local farmer (Mr. Bencze) on the whole subsite (3.4 ha). Hand mowing (with removing the biomass) was applied to suppress the dominant reed on the banks of the lake in the site. Very good results were recorded after a small scale removing of upper soil layer on the site (realised in 2012). In 2014, cca 400 individuals of *Crypsis aculeata* a halophyte acutely threatened with extinction emerged on the site. This comprises cca 80-90 % of all individuals presently known in Slovakia. Also a typical plant community *Crypsidetum aculeatae* was formed here. This community, typical of salt marshes was considered missing for several years in Slovakia. *Heleochloa schoenoides* (CR) and *Chenopodium chenopodioides* (CR) were also found in this patch.
- Harrowing was applied almost on the whole area of part Panské lúky (58.9 ha) to promote rejuvenation of plant species typical for the target habitats.

SCI Síky – 32 ha.

- Harrowing was applied almost on the whole area of the site (32 ha) to promote rejuvenation of plant species typical for the target habitats.

General remarks:

Combined approach was applied to suppress the dominant grasses (*Calamagrostis* sp.) and less palatable herbs in several sites - e.g. Pavelské slanisko, Kamenínske slanisko, Šurianske

slaniská, Bokrošské slanisko. The ungrazed patches of *Calamagrostis* sp. (sheep and cattle avoid them especially in mature stages due to low digestibility) were mulched prior to flowering/forming seeds. Although the grass did rejuvenate, the young sprouts were more easily grazed by the animals (due to lower level of secondary metabolites), thus it was more effectively suppressed than by grazing alone. As a result, the abundance and viability of *Calamagrostis* sp. on the sites has decreased significantly, creating space for halophytes.
Also the rejuvenation of shrubs and trees was controlled in a similar manner.

Other relevant conservation actions realised on project sites:
In some project sites, we encountered the problem of **illegal ploughing** of parts of the site (this problem started long time before the beginning of the project). Representatives of responsible farming companies were contacted and confronted with the situation - in cooperation with SNC. After discussion, an agreement to restore the ploughed land was achieved. The restoration was carried out in two ways: where possible, the soil was left for natural regeneration. Where the soil salinity was not sufficient and the seed bank of halophytic plants obviously not present, the soil was sown with short living plant species (*Medicago sativa* or *Lollium perenne*) to prevent overgrowing with weeds and invasive plants. It is foreseen that they should tolerate the conditions on the sites for only 2-5 years and should be gradually replaced by halophytes from the site. Preparation of soil and sowing was carried out by the responsible farms, project provided grass seeds. Altogether, 15.6 ha of formerly ploughed salt marshes were restored on SCI Kamenínske slaniská (11.7 ha), SCI Pavelské slanisko (1.5 ha), SCI Mostová (1.2 ha), SCI Bokrošské slanisko (0.5 ha) and SCI Komárňanské slanisko (0.7 ha).

10 illegal waste dumps were removed from 5 project sites: SCI Pavelské slanisko (2), SCI Komárňanské slanisko (3), SCI Pri Orechovom rade (1), SCI Kamenínske slaniská (3), SCI Bokrošské slanisko (1), often in cooperation with SNC and local municipalities:

In some sites, **uncontrolled feeding of game** by hunters was posing a potential threat (especially as a potential source for spreading of invasive plant species). The representatives of local hunter associations were contacted and they agreed on reducing/removing the feeding places on the project sites. This was achieved in SCIs Mostová, Pavelské slanisko, Komárňanské slanisko and Bokrošské slanisko.

<u>Problems and their solutions/Modifications</u>
Action C1 was not implemented on project sites SCIs Bačove slaniská/Juhászove slance, Jurský chlm and southern fragment of SCI Šurianské slaniská (the so called sub-site "Čiky"). The project team realised many meetings with relevant land owners and land users on these sites in order to find suitable solutions to carry out sustainable conservation management. However, the owners or land users on the sites refused to allow the implementation of project´s conservation actions. In SCI Jurský Chlm, communication with Roman-Catholic church was established, however, they decided to lease the land to a new land user, who refused to allow implementing of project´s conservation actions on the site.
Due to these reasons, the implementing of project´s conservation actions was focused on other project sites, where there was good potential for cost-effective and sustainable implementation of project actions. In total, action C1 was implemented on 9 out of 11 project sites, on an area of 379.3 ha.

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex C1_1 Photodocumentation
FR Annex C1_2 Overview maps of areas restored by action C.1 within the project sites

Action C.2: Restoration management of sand dunes (SNC)

Description and outputs

Several field visits and meetings with land owners/users were carried out at SCIs Nesvadské piesky, Chotínske piesky and Marcelovské piesky. Locations of planned management measures were discussed and agreements of land owners concerning mowing, harrowing, mulching, removal of trees and soil barrier at the mentioned project sites were obtained.
Outcomes were elaborated into the public procurement documentation and contractor for the work has been selected. Contract included all restoration management activities, including harrowing, mowing, tree and soil barrier removal with proposed timing for each activity.
Some management measures were implemented by the SNC staff in cooperation with concerned municipal offices. To ensure a favourable status of habitats, removal of alien species started already in 2011 even though the starting date for this activity was scheduled for April 2013. External contractor started to work on sites in 2014.

Overview of management measures implemented by the SNC staff in cooperation with local communities:

SCI Nesvadské piesky (part Líščie diery)
- removal of waste dump on an area of 0.5 ha
- removal of *Ailanthus altissima* from an area of 0.8 ha
- mowing of parcels overgrown by ruderal and invasive plant species on an area of 0.5 ha
- mowing of area after soil barrier removal (0.5 ha) to control ruderal plant species overgrow

SCI Nesvadské piesky (part at the chapel)
- removal of *Robinia pseudoacacia* and *Negundo aceroides* sprouts, mowing of parcels overgrown by invasive and ruderal plant species on an area of 1 ha

SCI Marcelovské piesky
- removal of waste dump on area of 1.1 ha
- removal of *Robinia pseudoacacia* (including sprouts) from an area of 3.5 ha
- mowing of parcels overgrown by invasive and ruderal plant species on an area of 1 ha
- mowing of area after soil substrate removal (1.13 ha) to control ruderal plant species overgrow

SCI Marcelovské piesky-part Mašan
- removal of *Robinia pseudoacacia* (including sprouts) and biomass on area of 1.5 ha
- removal of waste dump on area of 1.5 ha
- mowing of parcels overgrown by *Calamagrostis epigeios* on an area of 1.5 ha

SCI Chotínske piesky
- removal of *Robinia pseudoacacia* from an area of 2 ha

Overview of management measures implemented by the external contractor (Silvatech, s.r.o. Zvolen):
SCI Nesvadské piesky -part Líščie diery (a map of applied management measures was attached as **MTR Annex C2_1)**
- removal of soil barrier from an area of 0.2 ha (cca 2,000 m^3 of sand) and overall area arrangement after the removal of soil barrier (0.5 ha)
- removal of tree barrier (125 individuals of *Robinia pseudoacacia*)
- removal of *Robinia pseudoacacia* sprouts and biomass from an area of 0.8 ha

SCI Marcelovské piesky (a map of applied management measures was attached as **MTR Annex C2_2)**
- removal of soil substrate (cca 1213 m^3) from an area of 1.13 ha and overall area arrangement (0.25 ha)
- removal of *Robinia pseudoacacia* sprouts and biomass from an area of 2.9 ha

SCI Marcelovské piesky-part Mašan (a map of applied management measures was attached as **MTR Annex C2_3)**
- mulching of grass vegetation on area of 1.5 ha
- mowing of parcels overgrown by *Calamagrostis epigeios* on an area of 1.25 ha
- removal of biomass from an area of 1.25 ha

SCI Chotínske piesky (a map of applied management measures was attached as **MTR Annex C2_4)**
- removal of tree barrier consisting of 607 *Robinia pseudoaccacia* individuals
- removal of *Robinia pseudoacacia* sprouts from an area of 0.6 ha
- removal of shrubs from an area of 0.47 ha
- mowing and harrowing on an area of 1.43 ha
- removal of biomass from an area of 2.5 ha

Reduction of invasive tree species *Robinia pseudoacacia* was carried out using sawing and consequent application of herbicide on a cutting area or by spraying of herbicide on sprout shoots of black locust. In order to speed up the necrosis of stumps deep saw-cuts were made on cutting area and herbicide was applied into those undercuts. Some stumps were de-barked. The success of this intervention was evident.

In total, *Robinia pseudoaccacia* was removed from an area of 13.57 ha. Waste dumps were removed from SCIs Nesvadské piesky – part Líščie diery, Marcelovské piesky – parts Marcelovské piesky and Mašan from an area of 3.1 ha. Mowing and harrowing was implemented on an area of 9.81 ha. Soil barrier on an area of 0.2 ha (cca 2,000 m^3 of sand) and soil substrate (cca 1,213 m^3 of soil) were removed. Tree barriers consisting of 732 *Robinia pseudoacacia* individuals were removed. Photodocumentation was reported as **MTR Annex C2_5**.

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
Main project outputs were achieved as planned.

Action C.3: Improvement of hydrological regime of salt marshes (DAPHNE)

Description and outputs

In order to prepare restoration of small-scale localities for restoration of salt marshes, detailed examination of soil conditions in proposed localities combined with exact mapping of restoration sites, which were also clearly marked in field (**PR2 Annex C3).** This helped to identify the most appropriate locations for creation of depressions, where high salinity in topmost soil layer was measured (app. 15 cm below surface). Except the small-scale restoration of saline stands the studies / surveys suggested that instead of creation of clay barriers, at Kamenínske slaniská site filling in of the drainage ditch located in the eastern part of the project site would improve the hydrological regime of the locality.

The restoration works had begun in autumn 2015 on the project sites: Bokrošské slanisko, Pavelské slanisko, Ráczovo jazierko lake, Panské lúky, Akomáň and Mostová, after all planning and permitting was completed. Photodocumentation was reported in **MTR Annex C3.** In total 1.47 ha of small-scale depressions were created at this phase. At Kamenínske slaniská project site the restoration works could not begin before April 2016, though the works were successfully procured and contracted in late autumn 2015. Start of the works was delayed due to complex authorisation process as the actual restoration of halophytic habitats was connected to removal (filling-in) of a drainage ditch, suggested by restoration study. For such works construction permit had to be obtained. The situation was also complicated by unclear ownership, when the ditch was formally regarded as property of an unknown owner. Moreover the hydrological conditions on the site did not allow starting of the works earlier, as most of the locality was flooded by raised groundwater table and the soil remained soft and muddy till spring 2016, which would not allow access of heavy machinery unless significant damage was made to the soil surface and the vegetation.

For filling-in the drainage ditch a local source of soil with high portion of clay particles from the nearby land parcel has been used. This avoided longer transportation routes and minimised adverse side effects on environment and human health (which was one of the concerns of the local authority). In parallel with filling-in the drainage ditch the removal of the upper soil layer in small-scale restoration sites for support of development of halophytic habitats has been implemented. Altogether 14 plots with a total area of 1 ha were created. The soil taken from the restoration plots was used for covering the drainage ditch, too. It was spread on the surface as the top-most layer which shall support development of native vegetation from the seed bank contained in the soil. During restoration more than 5000 m^3 of the soil were transferred to fill-in the drainage ditch on a total length of 450 m. On the surface of the former drainage ditch an additional 0.5 ha of area for possible development of halophytic habitats was created. The restored area became an integral part of the site and is further maintained by grazing cattle. The access roads to construction site – the drainage canal and the localities of soil removal – were fixed after completion of the works to prevent local drainage of the halophytic habitats by tracks of the heavy machines.

At Bokrošské slanisko the possibility of filling-in a small drainage ditch situated in the central part of the site was considered as an additional measure to enhance the effects of restoration made in autumn of 2015. The ditch was about 40 m long running in NE-SW direction, with an average width of 2 m and depth of 1 – 1.5 m. For filling-in a transfer of local soil from embankment was used. The works were completed in late November 2016. Photodocumentation can be found as **FR Annex C3_1.**

The outputs of the action thus include **3 ha of small-scale restoration sites created and 490 meters of drainage ditches removed** for support of halophytic habitats development in total.

As it was described above the project proposal included providing of water supply for soil by groundwater pumped up by wind water pumps. This activity aimed primarily at improving the water regime of saline habitats by enabling gradual evaporation of the water and thus increasing the salinity at local terrain depressions. The secondary aim was to provide water for the grazing cattle and sheep. Though this measure was not recommended by the study on eco-hydrological restoration of salt marshes, as its impact would not be significant (respond on the Midterm report Ares(2016)1402217 - 21/03/2016 ANNEX, Technical issues: Par. 2.), the secondary reason still remained valid. To support grazing in some of the project localities providing or improving access of grazing animals to water was necessary. After complicated public procurement the supplier was finally selected in early 2017 and altogether **6 wind-run water pumps were installed** during March 2017 on the following project sites: SCI Kamenínske slaniská - 3 pumps (western, southern and eastern part of the site), SCI Mostová - 1 pump, SCI Pavelské slanisko - 1 pump, SCI Komárňanské slanisko - 1 pump. Photodocumentation can be found as **FR Annex C3_2.**

Problems and their solutions/Modifications

There was later start of the action than expected. It was caused by fact that the idea of underground clay barrier along the drainage canals was tested by engineering geological survey (Action A4) of both considered sites – Bokrošské slanisko and Kamenínske slaniská. It was found out that level of underground water is very low and on both sites building of clay barrier is not suitable to secure sufficient increase of the water table. There are drainage ditches on both sites. The one at SCI Bokrošské slanisko is directly connected with Danube River and it is not possible to remove / fill it up. The drainage channel on the eastern border of SCI Kamenínske slaniská is not so important from the water management perspective, but its removal may help to improve the hydrological regime of the project site. The feasibility of removing of the drainage canal at its part located in (along) the project site was negotiated with local stakeholders, mainly the municipality of Kamenín village. After several meetings, obtaining of a number of permits and opinions, planning and procurement we have got approval to implement this restoration measure, which is very innovative in the national context.

Using of the wind-powered water pumps to supply water could be also considered as innovative solution in our national conditions. Their acquisition was complicated by the fact that the supply should contain not only the purchase of the devices, but also installation, putting into operation, training of staff and further service. Such complex services are provided in our region only by one company based in Czech Republic. Other company from Slovakia provides retail of wind water pumps, but without providing additional services (such

as installation, etc.). As the only complete price offer was not considered sufficient by the Ministry of Environment as the co-financing authority, the requests for preliminary offers were distributed to wider pool of companies focusing on similar activities, such as construction of wells, irrigation systems, heat-pumps, etc. Altogether 20 additional companies were provided with detailed technical information about the procurement, but only after personal communication and detailed explanation of the subject it was possible to obtain 3 preliminary price offers in October 2016. This enabled us to complete the public procurement in late autumn of 2016 only. The final supplier was contracted in December 2016 and after winter was over the pumps were installed in the field in early spring of 2017.

Accordance with the timetable

There was later start of the action than expected due to reasons described above. The action lasted till March 2017 due to installation of wind-run water pumps.

Annexes of the action

FR Annex C3_1 Photodocumentation Bokroš channel

FR Annex C3_2 Photodocumentation wind-run water pumps

Action C.4: Eradication of alien invasive tree species plants in sand dunes (SNC)

Description and outputs

Mapping of fertile individuals of *Ailanthus altissima* was carried out in 2014. These individuals were sources for new diasporas and they must be primarily eliminated. Fertile individuals were spot-mapped and located by GPS. Thickness of the trunk in height of 1.3 m was recorded. The number of individuals was recorded in case of very dense growth when it was not appropriate to record each individual separately. Data were evaluated using GIS software. By combination of the layer of spatial occurrence of non-fertile individuals with the layer of punctual occurrence of fertile individuals a necessary database was acquired in order to prepare detailed tender specification. Fertile individuals of *Ailanthus altissima* aimed for chemical eradication were marked.

Chemical eradication was implemented from August till September 2015 at the SCIs Čenkov and Nesvadské piesky (part Líščie diery) on the area of 60.22 ha (60 ha at the SCI Čenkov, 0.22 ha at the SCI Nesvadské piesky, part Líščie diery). Works were done by the supplier (Radek Godora, HSQ Team Prievidza). The stem injection method was applied for the eradication of all individuals of tree of heaven. This application involved herbicide containing glyphosate into the cambium layer of the tree by an injection. The holes into the trees were done using the cordless drills (spacing the injection at 7.5 cm intervals around the circumference on the stem). This method was included into national legislation.

At the SCI Čenkov all individuals of tree of heaven (non-fertile and fertile) were eradicated at two forest stands (number 512 and 513) regardless of their age. Furthermore 1,385 fertile individuals were eradicated at this project site (a map of location of eradication at SCI Čenkov was attached as **MTR Annex C4_2**). At the SCI Nesvadské piesky, part Líščie diery all individuals of tree of heaven (non-fertile and fertile) were eradicated at forest stand number

378 and surrounding area (a map of location of eradication at SCI Nesvadské piesky, part Líščie diery was attached as **MTR Annex C4_1**).

Ailanthus altissima stems were monitored for injection effectiveness two weeks after treatment. Significant signs of deterioration of trees were visible - dry leaves, stems and sprouts – so that it can be stated that stem injection method is effective in producing stem mortality in a short time (photodocumentation was attached as **MTR Annex C4_4**).

The field inspection was carried out also in mid-April 2016 and we found that the success of the intervention in 2015 was 90%. Based on inspections the repeated intervention on surviving individuals was done by the same supplier in June 2016 at the same plots.
Based on high effectiveness of this method and the necessity to reduce invasive species on the rest of the heavily infected SCI area we extended of *Ailanthus altissima* eradication at SCI Čenkov on additional adjacent forest stands (507, 508, 511) on the area of 62.78 ha (a map of proposed eradication **was attached as MTR Annex C4_3**). Individual tree of heaven (non-fertile and fertile) regardless of their age (non selective eradication) were eradicated by the supplier (Green Oasis, s.r.o. Bratislava) in May 2017.

In total, *Ailanthus altissima* was eradicated from the area of 123 ha (122.78 ha at SCI Čenkov and 0.22 ha at SCI Nesvadské piesky – part Líščie diery). Simultaneously additional dispersed fertile individuals (more than 4, 300) from the area of about 200 ha were eliminated by SNC SR staff outside the area on which a supplier operated. Overall eradication treatment can be found on map – attached as **FR Annex C4_1**.
To ensure this activity by own staff needed equipment (cordless drills with accessories, sets of batteries, generators to recharge the batteries in the field), set of tools (spray machines with accessories, machetes, knives, herbicide applicators) and herbicide were purchased.

As requested by letter from 21/5/2016, ARES 1402217 complete tender documentation can be found in **FR Annex C4_2** and **FR Annex C4_3.**

Problems and their solutions/Modifications

As significant results using stem injection method were achieved an extension of *Ailanthus altissima* eradication at SCI Čenkov on the area of 62.78 ha was done.

Accordance with the timetable

Implementation of activity was delayed due to administrative problem and a long time lasting public procurement process.

Annexes of the action

FR Annex C4_1 Map of overall eradication treatment
FR Annex C4_2 Tender documentation for the tree of heaven eradication made in 2014/2015
FR Annex C4_3 Tender documentation for the tree of heaven eradication made in 2016/2017

Action C.5: Restoration and management of halophytic and sand habitats by reintroduction of traditional grazing (BROZ)

Progress of action:

Grazing was restored on 350.2 ha of project sites - altogether on 11 sites. A significant amount of grazing infrastructure was created within the project: 42 km of fixed fences, 6 shelters for grazing animals, 12 watering wells and 5 km of mobile electric fencing.

A mobile herd of 99 sheep was purchased. 77 cows (calves) and 5 water buffaloes (calves) were purchased and provided for local farmers and communities for restoration and long-term keeping of grazing on the project sites.

Thanks to these measures (and also restoration measures implemented within action C1 and C2 as well as wind water pumps procured within action C3) – the grazing on the project sites was secured in a sustainable way and will continue on long term also after the end of the project.

Activities on project sites were following:

SCI Pavelské slanisko: grazing was restored on the whole site (18.5 ha) with the mobile herd. Necessary infrastructure was prepared on the site for long-term grazing (fixed fences, watering wells).

SCI Kamenínske slaniská: Grazing regime was introduced almost on the whole site (108.9 ha). On all parts of the site, grazing was realised in cooperation with local farmers. Their requirements to restore grazing was building a fixed fence (esp. nodal net fences), shelters and watering places for animals, as well as providing part of the animals from project funds. For this purpose, Hungarian grey cattle (29), as well as water buffaloes (5) were provided by the project, which should be optimal for restoring the degraded parts of the sites. In the western, northern and eastern part it was also necessary to buy the land to enable grazing.

SCI Šurianské slaniská: Grazing was restored on 97 ha in the northern fragment of the site (Akomáň) – in cooperation with a local farmer (Mr. Raučina). The requirement of the farmer was to provide fixed fences and animals for grazing. Two types of fences were built on the site – a higher nodal net fence was built in eastern part of the site, where animals can be kept day and night. This is a robust type, with minimal risk of stealing or animals escaping. The major western part of the site is secured by fixed electric fence, where animals will be grazed day-long during the season. This part is divided into 3 segments for better regulation of grazing pressure.

38 young cows were purchased and provided to the farmer. The calves of breed Slovak tethered brown were provided, as required by the farmer. His plan for future sustainability is to build a small dairy and restaurant near the site, where he could sell products from animals grazed on the site in future. The cows will be used for grazing solely on the site, on long term, also respecting the needs and goals of After-Life management plan.

SCI Mostová – grazing was restored on the whole site (22.5 ha) with the mobile herd. Fixed electric fence was built and two watering wells created on the site.

SCI Bokrošské slanisko – grazing was restored virtually on the whole site (10 ha) in cooperation with a local farmer (Mr. Kurucz). A mixed herd of horses, goats, sheep and a donkey was grazed on the site. The requirements of the farmer were to provide a fixed

electric fence a watering place and a wooden shed for animals. These were provided by the project.

SCI Pri Orechovom rade – grazing was restored almost on the whole site (1.5 ha) in cooperation with a local farmer (Mr. Janetka). Horses and occasionally also goats and sheep are grazed on the site. Fixed electric fence, mobile fencing and a watering well were provided by the project.

SCI Marcelovské piesky – grazing was restored in the northern fragment of the site (6.3 ha) in cooperation with a local farmer. The farmer required the construction of the necessary infrastructure - fixed fences and a shed for animals on the site. These were provided by the project as well as necessary communication with land owners and relevant authorities.

SCI Chotínske piesky – grazing was restored on a major part of the site (4 ha). The whole grassy part of the site is grazed, including parts where invasive trees were cleared by Action C.2. Thus, their resprouting can be effectively controlled. Grazing is realised in cooperation with local municipality. The mayor required the construction of the necessary infrastructure – a fixed electric fence (including a supply of electric impulses), a shed for animals and a watering well. This was supplied by the project.

SCI Komárňanské slanisko – grazing by cows was restored almost on the whole site (14.5 ha). Fixed fences and a watering place were constructed on the site to secure the grazing regime.

SCI Čenkov – grazing was restored on 51 ha of the site in cooperation with a local farmer. In order to secure the grazing animals, fixed fences were built on the site, including a smaller acclimatisation area fenced by taller fencing. 2 watering wells were constructed and 10 young cows (Hungarian grey cattle) were provided to the local farmer, since this was his condition for cooperation.

SCI Síky – grazing regime was improved on 16 ha in the southern and eastern part of the site in cooperation with a local farmer. Mobile electric fencing required for better focusing the grazing pressure was provided within the project.

Problems and their solutions/Modifications

In total, 42.0 km of fixed fences were built on the project sites – of this 17.7 km of nodal net fences and 24.3 km of fixed electric fences. Most of the sites are surrounded by intensive agricultural fields, roads, railways or forest land. Escaping of animals into any of such areas would have serious consequences and could put reaching the project objectives in risk. Thus, constructing the fixed fences was absolutely necessary to secure feasible and sustainable grazing regime on the project sites. In most cases, it was also a crucial condition of local farmers for their cooperation on the project. Fixed fences are not only a safer option, but require also much less maintenance than other solutions (e.g. mobile electric fencing) – thus making the grazing on project sites much more sustainable on long-term. Naturally resistant materials were selected for construction (black locust or oak wood was used for poles; bark was removed on parts placed in the ground; zinc-finished steel wires/nodal nets) to ensure maximum durability. Therefore, this can be considered a highly cost-effective solution, especially on long-term.

Construction of more fixed fences than originally expected in the project proposal was approved within the Commission communication Ares(2015)3911582 - 22/09/2015; Annex, point 3. The exact length of fixed fences constructed on each project site is listed in **FR Annex C5_3**.

For effective restoration of certain types of salt marsh habitats, cows and water buffaloes were found to be a much more effective option than sheep or goats. This was recommended also by the expert study A.3 and by experience from other LIFE projects as discussed within the networking trips (action E3). Therefore, besides the mobile herd (99 sheep), also 77 young cows and 5 water buffaloes were purchased for restoration of grazing on the project sites. The purchase of grazing animals other than sheep and goats (e.g. cows, water buffaloes, etc.) was approved within the Commission communication Ares(2015)3911582 - 22/09/2015; Annex, point 3.

In SCI Jurský Chlm, communication with the land owner - Roman-Catholic Church was established in order to allow grazing on the site and the proposal to lease the land was discussed. However, in the end they decided to lease the land including the project site to a new land user, who strictly refused to allow reintroduction of grazing on the site.

Due to these reasons, the implementing of action C5 was focused on other project sites, where there was good potential for sustainable reintroduction of grazing.

The purchase of diesel oil tank is justified in Comments on the financial report section, chapter 6.1.3 Equipment (also in response to question raised in letter from EC no.: ARES(2016)1402217 – 21/03/2016 par. 7).

As requested by your letter from 02/08/2017 (after the visit, Ares(2017)3869222) regarding financial request on fences (see also chapter 6.1.3 External assistance), it can be found in **FR Annex C5_5** Accounting proof on length of fixed fences built on SCI Komárňanské slanisko.

Accordance with the timetable

In the project it was originally anticipated, that the grazing regime would be restored on 350 ha of project sites and animals purchased by 31/05/2015 (see Milestones of the project). Several permissions from different offices had to be obtained to allow grazing as well as creating the necessary infrastructure on the project sites. These include exceptions from forestry law, railway track regulation, watercourse management regulation, road network regulation (mainly to obtain permissions for implementing project activities in the protective zones of railways, main roads, etc.), permissions from local municipalities and others. In many cases, these are lengthy procedures, requiring several expert statements and technical assessments from more departments, often taking several months. Some of the administrative and permission processes took longer on the side of relevant authorities than originally expected and proclaimed by the authorities.

Also, in 2014 and 2015 outbreaks of blue tongue disease were reported from several regions in Hungary. Due to high risk of infection and practically 100% mortality among the infected cattle, a large scale zone of strict carantene was proclaimed by the State veterinary office. The zone contained also several districts of southern Slovakia, including majority of the project sites. Due to the carantene measures, purchasing and transporting animals was strictly limited. Purchasing and transporting the animals to restore grazing on project sites was hampered and took longer than originally expected. This was an unexpected complication beyond the competence of project beneficiaries.

From the reasons outlined above, it was necessary to shift the deadline of the above mentioned milestone beyond this date.

However, after obtaining the necessary permissions, the grazing was restored on all sites, where it was planned and the project objective – to introduce grazing regime on 350 ha of project sites was reached.

Annexes of the action

FR Annex C5_1 Photodocumentation
FR Annex C5_2 Overview maps of areas restored by action C.5 within the project sites
FR Annex C5_3 Exact lengths and types of fixed fences constructed on each project site
FR Annex C5_4 Calculation of funds and resources saved by the purchase of diesel-oil tank
FR Annex C5_5 Accounting proof on length of fixed fences built on SCI Komárňanské slanisko

Action E.3: Monitoring of impact of restoration measures on focused habitats

Vegetation monitoring

Large scale monitoring of targeted habitats

All project sites were mapped according to the methodology prepared by the project in 2012. Repeated monitoring was realised in 2016 and 2017. Repeated monitoring was not realised at SCI Čenkov, as it was replaced by the monitoring of eradication of tree of heaven – its efficiency and impact on priority habitats. Also it was not realised for the part of SCI Šurianske slaniská – part Čiky. It was obvious from the beginning of project, that stakeholders disagree with any proposed measures and so it was not effective to monitor vegetation changes. The same situation – disagreement of local stakeholders was on other two sites – at SCIs Juhászove slance and Jurský Chlm. In this case, however, negotiations took place during the implementation of the project and the project team tried to get their support until the end of the project and that's why the habitats were monitored.

Vegetation data were stored in the database and used for several purposed – preparation and planning of restoration measures, preparation of vegetation and management maps for management plans and as a baseline situation for monitoring of impact of restoration activities.

Large scale monitoring was based on extensive data set. Data set was stored in MS Access database **(FR Annex E3_1)** and it is linked to GIS in order to prepare spatial analyses and subsequent maps. We were evaluating also set of indicators calculated from GIS/database. We used area of habitats, area of particular species groups (halophytes, psamophytes, ruderals), areas of vertical vegetation layers. Values of indicators were compared in time.
Canonical correspondence analysis (CCA) is a multivariate extension of weighted averaging ordination, which is a simple method for arranging species along environmental variables. CCA constructs those linear combinations of environmental variables, along which the distributions of the species which are maximally separated. The eigenvalues produced by CCA measure this separation. As its name suggests, CCA is also a correspondence analysis technique, but one in which the ordination axes are constrained to be linear combinations of environmental variables. The ordination diagram generated by CCA visualizes not only a pattern of community variation (as in standard ordination) but also the main features of the distributions of species along the environmental variables.
Two data sets were prepared for CCA – salt marshes: 118 records from mapped polygons supported by 678 taxa and sand dunes: 71 records from mapped polygons supported by 405 taxa. As environmental variables were used "salinity" (cumulative value of halophytes in record), "sand" (cumulative value of psamophytes in record), "ruderal" (cumulative value of ruderal species in record). After Monte Carlo permutation test we got for salt marsh data set

"salinity" and "ruderal" as significant environmental variables. For sand dune data set we tested "sand" and "ruderal" as significant environmental variables.
The CCA of salt marshes shows generally, very good trend in localities where restoration actions were successfully implemented at SCIs Kamenínske slaniská, Pavelské slanisko, Bokrošské slanisko, Mostová and Panské lúky. In few cases we recorded also negative trends (ruderalisation) in some polygons in SCIs Juhaszove slance, Komárňanské slanisko and Panské lúky.
The result of CCA of sand dunes shows positive examples in SCIs Chotínske piesky, Nesvadské and Marcelovské piesky. Negative trends (ruderalisation) are stronger especially in some polygons of Marcelovské piesky and Líščie diery. Complete habitat monitoring report can be found as **FR Annex E3_2.**
Explanation to the remark in the letter Ares 1195453, 07/03/2017, point 8. Vegetation mapping on 6 project sites was not realised in 2016, but instead was realised in 2017, to have the most recent data for comparison of changes. According to our opinion, it is not a problem, as we were able to fulfil our monitoring task – to compare vegetation data before and after implementation of restoration measures.

The impact of grazing – evaluation of changes based on the small scale monitoring plots.

Small scale monitoring plots (4 by 4 metres) were established in the field for vegetation monitoring of grazing impact on following project sites:

SCI Kamenínske slaniská – two plots established in 2013, repeated monitoring in 2014, 2015, 2016 and 2017.
SCI Pavelské slanisko - two plots established in 2013, repeated monitoring in 2014, 2015, 2016 and 2017.
SCI Mostová – one plot established in 2014, repeated monitoring in 2015 and 2017.
SCI Bokroš – one plot established in 2014, repeated monitoring in 2015 and 2017.
SCI Komárňanské slanisko – one plot established in 2014, repeated monitoring in 2015 and 2017.
SCI Chotín – one plot established in 2014, repeated monitoring in 2015 and 2017.

The results of the monitoring carried out show the positive effect of grazing on targeted vegetation of salt marshes. The appearance of permanent monitoring plots has changed already in the first year after the grazing began, the old biomass disappeared, and vegetation was opened by grazing and trampling. The species diversity on the permanent plots has increased, especially in the case of the mezophilous species and facultative halophytes, on some sites also obligatory halophytes. In the case of halophytes, the coverage is usually low except for exceptions, and they are often represented only as an accessory. As a result of the influence of grazing, the populations of obligatory (*Artemisia santonicum, Plantago maritima, Puccinellia distans, Tripolium pannonicum*) and facultative halophytes (e.g., *Bupleurum tenuissimum, Festuca pseudovina, Podospermum canum*) were strengthened.

Changes in the species spectrum and the coverage of facultative halophytes and other species were recorded in relation to the extreme climatic conditions (drought 2015 and 2017), which was particularly pronounced in the group of other species. By their reduction, both the facultative and the obligatory halophytes have a competitive advantage in occupying the released niches and creating stable communities that should have higher resistance, especially in relation to the entry of ruderals and weeds. Based on the

monitoring, we can see that year-on-year oscillations are more pronounced than long-term trends. To obtain answers to the impact of grazing on the salinity vegetation, it is necessary to continue monitoring in the coming years.

The results of the monitoring carried out at SCI Chotínske piesky show the positive effect of grazing on targeted vegetation of sand dunes. The appearance of permanent monitoring plot has changed already in the first year after implementation of restoration management (mowing and harrowing), the old biomass disappeared, and vegetation was opened. In the first year, we also saw a significant dominance of the bryophytes, up to 80%. In the second year it was 60% and only 20% in the last year of monitoring. Such a high dominance of bryophytes is typical of thermophilous stands that are not farmed for a long time. The total number of species increased slightly during the monitoring period. The vegetation structure remained unchanged. Restoration management and grazing does not have negative impact on the critically endangered species *Achillea ochroleuca.* Its population remains stable and it is dominant species within monitoring plot. In the last year, we have observed sandy species such as *Anthemis ruthenica* and *Silene conica*, ruderalisation is minimal. The whole report can be found as **FR Annex E3_3 and as database FR Annex E3_4**.

Explanation to the remark in the letter Ares 1195453, 07/03/2017, point 8. Vegetation monitoring on small plots was not realised in 2016 on four sites, but instead was realised in 2017. Considering the fact that we are recording trends in the development of vegetation on permanent plots, we do not consider a one-year drop out of the problem because we have captured the state of vegetation and trends in the coming year.

SCI Kamenínske slaniská

Four years from the beginning of grazing, we have seen positive changes in vegetation throughout the site. The population of the species *Carex divisa* has a strong upward trend. Species was not recorded on site before 2014, and species was considered to be extinct on the site. At present, it occurs in smaller or bigger parts scattered to more than 5 places within the site. *Trifolium retusum* is also a rediscovered species. Another clover, *Trifolium angulatum*, was confirmed in the residual micro-population prior to the beginning of grazing, currently present on relatively large areas in the northern part of the site. Both species of clover are very weak competitors and their occurrence is directly related to grazing. The grazing effect on very rare annual halophyte species *Camphorosma annua* is very positive. It is one of the most threatened halophyte species in Slovakia, and is almost threatened by extinction in almost all known localities. Since the beginning of grazing, we have seen the increase in the population at Kamenínske slaniská, but also spread to new places, especially on the most saline parts in the northern part of the reserve. Today, there is the richest and most abundant population in Slovakia. We also see an increase in abundance in the case of a further annual halophytic species *Heleochloa schoenoides*, which in the population constituted thousands of plants in 2017 mainly on the places with top soil removal.

Carex divisa

Trifolium angulatum

Trifolium retusum

Camphorosma annua

Plantago tenuiflora is endangerered halophytic species. As a poor competitor, is under the pressure of secondary succession or often restricted to secondary habitats. Due to the local re-introduction of grazing since 2013 (SCIs Mostová, Pavelské slanisko, Kamenínske slaniská) has increased population size of the species. Trampling and grazing creates appropriate micro-patches without competition of perennial species where *P. tenuiflora* seedlings can survive (Eliáš, P. jun., Dítě, D. & Dítětová, Z. (2016): Historical and current distribution of *Plantago tenuiflora* in Slovakia. – *Studia bot. hung.* **47**(1): 151–162).

SCI Komárňanské slanisko

In 2015 was recorded species *Cirsium brachycephalum* which is endemic to the Pannonian Basin, listed on Annex II of the Habitats Directive. It grows in salt marshes and salt meadows, needs to be regularly flooded and have a high groundwater table. It is the first record of this species on the site and has been discovered as a result of mowing and site management.

Grazing experiment

Because of unique opportunity that Kamenínske slaniská started to be grazed after about 40 years of abandonment, detailed field experiment was established on the site in cooperation with the Institute of Botany. Strip of the size 26 x 8 metres was fenced by wooden construction to see development of salt marsh vegetation without grazing. Around the plot were established small scale plots which were grazed. Baseline situation was recorded before start of implementation of restoration grazing.

The result of the four-year monitoring demonstrates the positive effect of grazing on vegetation. The appearance of permanent monitoring plots has changed after the first year of grazing reintroduction. The old biomass disappeared, and vegetation was opened by

trampling. As a result, the species richness has increased considerably after the first year, when 15 species were recorded. In 2017, 33 species occurred on monitoring plots which were grazed. Many grassland species are involved in the increase in the number of species, but they do not have much coverage and do not even spread. No new facultative or obligatory halophytes were recorded in the fourth year of data collection, indicating that the desalination processes in the soil have advanced significantly.

One of the observed factors in data collection is to monitor the response of the species *Galatella punctata* on grazing. Despite the fact that it is a relatively rare species in Slovakia, thanks to its strong competitive ability after abandonment of grazing, it has begun to grow expansively and continuously to cover most of the reserve. Grazing does not decrease the occurrence of the species, but it significantly decreases its coverage, the plants are much smaller and less blooming due to grazing. As for the *Iris spuria* population, it is not threatened by grazing; the coverage remains more or less constant throughout the data collection (around 5% on one area on average).

On ungrazed areas, the situation is more or less stabilized; the number of species does not change. There is an increasing accumulation of biomass and the cover of the scrubs is increasing. The rapid degradation of ungrazed areas highlights the need to maintain grazing on the site. The whole report can be found as **FR Annex E3_5**.

Monitoring of top-soil removal

There is a strong correlation between results of vegetation monitoring and comparison of topsoil electric conductivity measurements between-year changes within pedological monitoring points (graph 1). Top soil removal was realised on the broader scale of ecological conditions to be able to test its efficiency. This method was tested on such a big scale for the first time in Slovakia. Although it is a short, only two-year period of monitoring, it can be stated that the large-scale removal of the top soil removal on most areas has ensured occurrence of species, which were on selected areas already extinct (eg *Heleochloa schoenoides, Chenopodium chenopodioides, Pholiurus pannonicus*) and better survival of obligatory and facultative halophytes (eg *Artemisia santonicum, Plantago maritima, Lotus tenuis*). On most areas, coverage and species diversity have increased from year to year.

SCI Šurianske slaniská - locality Akomáň

Within an extensive locality of Akomáň, top soil was removed on one area on the southwest side of the site, part with the remains of halophytic vegetation *Artemisio-Festucetum pseudovinae*. We have rarely recorded 3 obligatory halophytes in the area: *Artemisia santonicum* subsp. *patens, Plantago maritima* and *Puccinellia distans* agg., only a few individuals. Despite the fact that the area is grazed by sheep, two vegetation seasons, after the topsoil removal, we can say that formation of halophytic communities did not started. We find here a mixture of ruderal, pastoral and mesophilous species. Vegetation cover was significantly influenced by drought in the first half of 2017. For the site Akomáň with the only plot, salinity after topsoil removal significantly decreased (graph 1). This trend needs to be verified by further measurement. It is possible that the level of mineralized groundwater is significantly reduced at the site and the capillary entrainment does not reach the surface layers. Observed bare stand depressions (called “salt eyes”) with highest salinity (even in the vicinity of the resting area) are obviously only the relics of past decay processes.

SCI Mostová

On the four areas with top soil removal, the overall coverage with the rising number of species increased, comparing years 2016 and 2017. Out of the facultative halophytes 11 species were recorded as *Cynodon dactylon, Agrostis stolonifera, Polygonum aviculare, Festuca pseudovina etc.* The occurrence of two obligatory halophytes *Artemisia santonicum* subsp. *patens* and *Puccinellia distans* was confirmed. On the marginal, most salted strip, we expect the spread of the obligatory halophytes. In 2016, the area had strong ruderalization and invasion of reed, but the mowing of the weeds in the spring of 2017 was positive and the weed's coverage and distribution decreased. The site is a few weeks during the growing season grazed by a herd of sheep. Due to these facts, the area has potential for the future, which also supports the occurrence of several halophytes in the vicinity.

SCI Panské lúky

After two vegetation seasons, we can evaluate the results on two plots (35Pl and 37Pl) as one of the most positive of all areas with top soil removal. Already in the first year, rare species, typical for the initial stages of the saline soils - *Atriplex litorallis* and *Plantago tenuiflora* have been found in a large number of populations, as well as *Chenopodium chenopoioides* (area 35, in year 1). In addition, in the second year the species *Pholiurus pannonicus* was added and it will be very interesting to follow further developments. With the number of 9 obligatory halophytes, we can speak of a very good result. Thanks to the micro-relief of both plots (slight depressions in which the water stagnates longer time), we can expect a favorable state even in the next period with the prospect of creating initial stages of vegetation type *Puccinellion limosae*. On the contrary, the plot 38Pl is among the weaker areas, in both years we have confirmed the occurrence of only one species (*Puccinellia distans* agg.)., In 2017 occurred very rarely *Tripolium pannonicum*.

SCI Panské lúky - part Ráczovo jazierko lake

Areas with top soil removal are located on the shore of the pond (R39) or within the highest water level (41.42R). In the first year, an initial stage of alternately flooded habitats with unconnected vegetation was created here. We have confirmed the occurrence of a typical species of this biotope *Chenopodium chenopoioides* and the occurrence of *Spergularia salina*. On the drier part above the limit of the maximum level also the fragment of the initial stage of vegetation community *Puccinellion limosae* with the species *Puccinelia distans* agg., *Tripolium pannonicum, Taraxacum bessarabicum* (only here on all top soil removal areas) and *Plantago maritima*. A total of 6 species of obligatory halophytes were observed, which in 2017 increased by 2 - *Carex secalina* and *Juncus gerardii*. In 2017, however species *Phragmites australis, Bolboschoenus maritimus* agg., *Agrostis stolonifera* and *Typha latifolia*. invaded on the plots. In the plot 42R we have confirmed in 2017 the occurrence of about 20 individuals of the annual species *Heleochloa schoenoides*. In the following years, it is likely to be expected to gradually dominate these competing species at the expense of rare and competitive species if no management is implemented.

SCI Kamenínské slaniská

The top soil removal was realised on 14 areas, which are concentrated in in the north and then in the southern part of the site. On the vast majority of the areas, after two vegetation seasons, vegetation develops rather towards ruderalized stands without or with the marginal occurrence of halophytic species. Within the topsoil removal areas, we have

verified the presence of 6 obligatory halophytes as *Limonium gmelinii, Plantago maritima, Puccinellia distans* agg., very rarely *Carex divisa*. Significant species in the area are still worth mentioning confirmation of the presence of *Iris spuria* on 2 plots in 2016, in 2017 it came third. From the point of view of vegetation development, the valuable occurrence of the pioneer species *Heleochloa schoenoides* was recorded in 5 plots, apart from the area 10K where it was already the second year. In this plot, hundreds of individuals appeared in 2017, and we can evaluate this area as best developed within all areas of the Kamenínske slaniská.

Among the facultative halophytes, most common are *Centaurium pulchellum, Festuca pseudovina, Lotus tenuis* and *Trifolium bonannii*. In most areas, abundant ruderal and synanthropic species, such as *Cirsium arvense, Carduus acanthoides*, were decreased in 2017. This was due to mowing on these surfaces. It seems that the further development of the vegetation will be directed towards the nearby vegetation of Festucion pseudovinae. Keeping current conditions is a prerequisite for improving the state of vegetation as we can see from the first year of grazing restoration.

SCI Pavelské slanisko

Top soil removal and modification of the pond shore marked a significant positive impact. In the first year after the top soil removal, a number of obligatory and facultative halophytes appeared on almost all areas (except for the area 32p where only *Chenopodium chenopodioides* was found). In addition, on the salted and gradually drying shores of the lake, we observed rare species as *Alisma gramineum, Cirsium brachycephallum, Chenopodium chenopodioides, Heleochloa schoenoides, Lythrum tribracteatum and Schoenoplectus supinus*, which have not been found yet on the site before restoration. The almost extinct population of *Atriplex littoralis* (growing only in the field trails before) created rich stands with dozens of individuals, especially on the plots 29p + 30p + 31p . Almost on all plots were recorded species Artemisia santonicum, Plantago maritima and Puccinellia distans, which abundance in the second year after the top soil removal mostly increased.

SCI Bokrošské slanisko

In the first year (2016), especially on the areas with the highest salinity (15b - 20b, 24b), was recorded the positive occurrence of several obligatory (*Artemisia santonicum, Plantago maritima, Puccinellia distans*) and facultative halophytes (eg *Bupleurum tenuissimum, Festuca pseudovina, Podospermum canum*). This positive trend remained the same in 2017, with coverage of both obligatory and facultative halophytic species having a predominantly increasing tendency. On the contrary, in the areas with the lowest salinity of the soil (21b - 23b), the positive effect was manifested only in the short term and the obligatory halophytes were rarely found only in the first year, later under the influence of unfavorable climatic conditions (drought in 2017) and the competitive pressure of other species mostly disappeared (except of only one species of *Artemisia santonicum*).

The whole report can be found as **FR Annex E3_6**.

Impact of eradication at SCI Čenkov

In 2015, within forest stands (number 512 and 513) with planned eradication, four monitoring plots 20x20 meters were established and marked. At each monitoring plot phytosociological relevé were recorded and individuals of the species *Ailanthus altissima* in individual thickness category (up to 5 cm, 5 – 10 cm, 10 and more cm) were counted. Then management intervention took place. On June 2016, monitoring was repeated and results

after two years were reported in **MTR Annex E3_1**. Monitoring was repeated also in June 2017.
From the results of the three-year monitoring it can be stated that the intervention aimed at the eradication of *Ailanthus altissima* was extremely successful, in the second year (after the intervention), all individuals with a thickness of over 5 cm and almost all thinner individuals died. In the third year of observation, however, we have seen a recurrent increase in the number and coverage of young *Ailanthus altissima*, both seedlings and those from offsprings. It is necessary to continue with the intervention to eradicate the young seedlings. The increase in the coverage of the herbage and the increase in the number of indigenous light, termophilous and psammophytic species in all monitored plots in the second and especially in the third year of observation. Species like *Arenaria serpyllifolia, Cynoglossum hungaricum, Melica ciliata, Onosma arenaria* and others appeared. The question remains whether this trend can be maintained in the future as the young *Ailanthus altissima* again pose a threat to herbaceous species and it is highly probable that if the intervention to eradicate the young seedlings does not recur in the near future a favorable trend in the return of the native species will be suspended. It is necessary to continue with the intervention to eradicate the young seedlings on regular basis. Results from monitoring can be found in **FR Annex E3_7.**

Pedological monitoring

Methodology

Soil salinity monitoring followed the methodology prepared by the project in 2014. The monitoring was realized at plots after topsoil removal (Action C3) with aim to detect soil salinity changes after the restoration. One monitoring point per plot was placed; smaller or homogeneous adjacent plots were covered by one common sampling point. Position of the monitoring point was established using GPS coordinates; in addition, iron rods, allowing for precise determination of sampling points by a metal detector, were placed in the ground. At each monitoring point, soil samples from two depths (0–5 cm and 5–10 cm) were collected immediately after the topsoil removal and one year after, as following:
SCI Kamenínske slaniská – 14 monitoring points established in 2016 (repeated monitoring in 2017).
SCI Pavelské slanisko – 4 points established in 2015 (repeated monitoring in 2016).
SCI Mostová – 5 points established in 2015 (repeated monitoring in 2016).
SCI Bokroš – 8 points established in 2015 (repeated monitoring in 2016).
SCI Panské lúky – 4 points established in 2015 ((repeated monitoring in 2016).
SCI Panské lúky – part Ráczovo jazierko – 3 points established in 2015 (repeated monitoring was not realised in 2016, as the site was flooded).
SCI Akomáň –1 point established in 2015 (repeated monitoring in 2016).
Soil salinity was measured by a standard laboratory method of soil suspension electrical conductivity. Comparative results demonstrating soil salinity changes are included in the final monitoring report **(FR Annex E3_8)**.

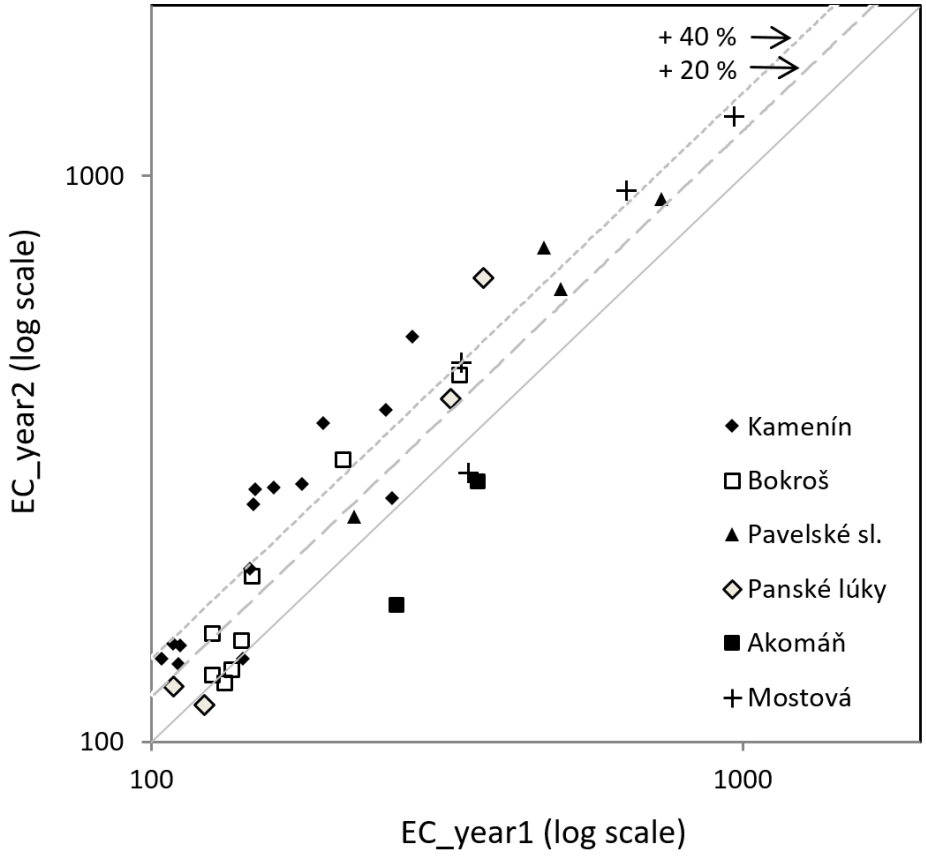
Results

Comparison of topsoil EC between-year changes at monitoring points was possible for 36 pairs of observations at 6 sites where topsoil removal was applied (graph 1). At one site, repeated sampling was not possible due to permanently increased water table at monitoring points.

One year after the measure, topsoil EC increased by 31% on average. The increase was recorded at 5 of 6 sites and for 29 points (81% of cases). For 24 points (67%), between-year EC increase was higher than 20% and for 11 points (31%) higher than 40%. For the site Akomáň with the only plot, salinity after topsoil removal significantly decreased. At plots of Kamenínske slanisko, soil salinization perspective seems to be very optimistic. 13 of 14 monitoring points revealed between-year salinity increase. Topsoil EC increased by 48% on average. Salinization was more intense (EC +73%) at plots located at the north part of the site, compared to other plots (EC +18%). Half of monitoring points installed at Bokroš and Panské Lúky revealed EC increase by 20% and more. At Pavelské slanisko, EC increased at all 4 monitoring points by an average rate +32% . 3 of 4 monitoring points showed EC increase by 40% on average.

Despite the short monitoring period, the results clearly suggest that revitalization management had positive effect on soil salinization at 5 sites. At Akomáň, the re-salinization perspective is bad, probably due to the absence of the mineralized groundwater in the reach of soil capillary forces.

Graph 1. Comparison of the soil suspension EC (µS.cm-1) - topsoil samples taken at the year of plots establishment (x-axis) and one year after (y-axis). Point position upper from the diagonal (solid) mean that EC increased.



Explanation to the remark in the letter Ares 1195453, 07/03/2017, point 8. The restoration measure was aimed to create suitable conditions for target species by uncovering more saline soil layer and to support progressive soil salinity increase with time. To record the soil salinity development after the intervention, monitoring was applied at plots. The applied soil monitoring methodology allowed for precise location of each monitoring point by steel rod

permanently placed to the ground. Soil was sampled in 50 cm distance from the rod, the compositional sample consisted of 7 sub-samples regularly distributed around the rod. As for the match of points before and after the topsoil removal, installed monitoring points followed previous sampling points with precision +- 2 m. However, as mentioned above, monitoring was aimed to record the trend of soil salinity development after topsoil removal. The difference in soil salinity at plot and out of the plot can be checked anytime in the future. Each monitoring point was sampled twice, with a one year interval. More frequent period of soil salinity monitoring is not reasonable as soil salinity has significant seasonal fluctuation.

Hydrological monitoring

Hydrological monitoring started in 2014 at two sites with planned realisation of underground clay barriers. Construction of underground clay barrier along the canals on SCI Kamenínske slaniská and SCI Bokroš was tested in the field by drilling of exploratory wells. Monitoring of 3 wells at SCI Bokroš and two wells at SCI Kamenínske slaniská started with the frequency twice per month. The idea of underground clay barrier at SCI Bokroš was rejected in 2015 as too complicated and uncertain, monitoring therefore continued until April 2017 only at SCI Kamenínske slaniská. Data were collected every two weeks by the project team. After the final database consolidation, 134 water-table records of two wells were evaluated. The results are presented and discussed in the final report of the monitoring (**FR Annex E3_9).**

Water-table dynamics analysis was performed for groundwater-level records from two hydrological monitoring wells at Kamenínske slanisko (6/2014 – 4/2017). Records confirmed that both monitoring wells are located in the same aquifer, as levels of their water tables were strongly correlated.

Analysis showed that the dynamics of groundwater table at the site strongly reflects seasonal weather dynamics and rainfall. The lowest levels of groundwater tables were observed in late summer months (August – September) when the evapotranspiration is the highest, and the highest groundwater level was observed at the end of winter (February – March) when groundwater is recharged after autumn and winter precipitation and evapotranspiration is low. The exception was the situation in late summer and autumn of 2014, when groundwater levels were re-charged by exceptionally high rainfall at the end of August and the beginning of September.

Results suggest that the groundwater residence time is probably rather short fast and the main source of groundwater at the site is local rainwater infiltration. The (hypothetical) regional source of mineralized groundwater responsible for the soil salinization has therefore probably only minor intensity. Therefore, any future measures in the watershed that may interfere with the local-regional groundwater balance have to be carefully considered, especially those performed at upstream areas.

Hydrological monitoring was planned to monitor impact of restoration measures realised on the site. The impact of drainage channel filling did not appear in the intensity that it would be possible to distinguish them from the dominant impact of the precipitation. This is also an important finding, because it may have happened some breakthrough of trends after the restoration. However, the duration of the monitoring was too short.

Both in 2017 and 2018, relatively large flocks of migratory birds were observed in northern part of SCI Kamenínske slaniská – in numbers, which were not usual in years preceding to restoration of water regime and grazing. These were especially waders (e.g. *Vanellus vanellus, Tringa totanus, Gallinago gallinago, Tringa glareola*) and waterfowl (*Anas crecca,*

A. querauedula) – which require periodic waters with low grass turf and absence of trees or bushes. As these conditions were on a large part of the site created by the project actions, the improved conditions for migratory birds can be considered as an important environmental benefit of the project (Lengyel, Kürthy, Littera ined.).

Other relevant results

The management of project localities had a significant positive impact on the local fauna species as shown for example on the Little Owl population in project region. The number of breeding pairs has increased by 20% since the project beginning in comparison to a 30% decrease in other areas of south western Slovakia (Chrenkova and Dobrý unpublished data).

Problems and their solutions/Modifications

It was planned to produce monitoring reports on hydrology and grazing yearly, pedological monitoring before and after restoration, and monitoring of habitats or at the beginning and end of the project. Our proposal was to store data in the databases and not to produce repetitive reports with description of baseline situation. It was approved in the letter from 27th February 2014 (ARES 525578) that yearly monitoring reports will be skipped and final monitoring report will be delivered at the end of the project.

Accordance with the timetable

Action was implemented according to timetable.

Annexes of the action

FR Annex E3_1 MS Access database of large scale habitat monitoring in electronic form only
FR Annex E3_2 Habitat Monitoring Report
FR Annex E3_3 Monitoring report on permanent plots
FR Annex E3_4 Monitoring Database_permanent plots in electronic form only
FR Annex E3_5 Results of grazing experiment
FR Annex E3_6 Monitoring of top soil removal
FR Annex E3_7 Monitoring of Ailanthus Eradication
FR Annex E3_8 Pedological monitoring
FR Annex E3_9 Hydrological monitoring

Action E.4: Networking with other projects (BROZ)

Description and outputs

5 networking meetings were realised:

Bohdalice, South Moravia, Czech Republic (3/12/2012): Meeting with representatives of NGO Manner. Experience with grazing on protected sites using a mobile herd has been discussed.

Körös Maros NP, Hungary (28-29/11/2013): Meeting with representatives of National park (NP) directorate, discussion on optimal way of disturbed and degraded salt marshes restoration as well as managing grassland habitats by grazing.

Hortobágy NP, Hungary (9-11/4/2014): Meeting with representatives of Hortobágy Environmental Association, activities implemented during project LIFE07 NAT/H/000324 presented and discussed, lessons learned shared.

Kiskunság NP, Hungary (5-7/8/2014): Meeting with representatives of NP directorate as well as Dunatáj NGO, activities implemented and planned during project

LIFE12 NAT/HU/001188 discussed. Discussion also on the restoration of sand dune habitats - project LIFE06 NAT/H/000104.
Project sites, Slovakia (4-5/2/2015): Meeting with representatives of HEA and Hortobágy Nature and Gene Conserving Non-profit Ltd. on four sites of the presented project (SCIs Kamenínske slaniská, Bokrošské slanisko, Šurianské slaniská, Pavelské slanisko), discussing the most effective ways of salt marsh habitats restoration. Planned activities of the project LIFE11 NAT/HU/000924 were discussed.
Continuous cooperation and knowledge exchange is conducted with 3 organisations: Comenius University, Dept. of Plant Physiology; Slovak Academy of Sciences, Institute of Botany; Slovak Agricultural University, Dept. of Botany and many individual experts.
Photodocumentation from the above described networking trips was attached as **PR1 Annex E4, PR2 Annex E4** and **MTR Annex E4**.

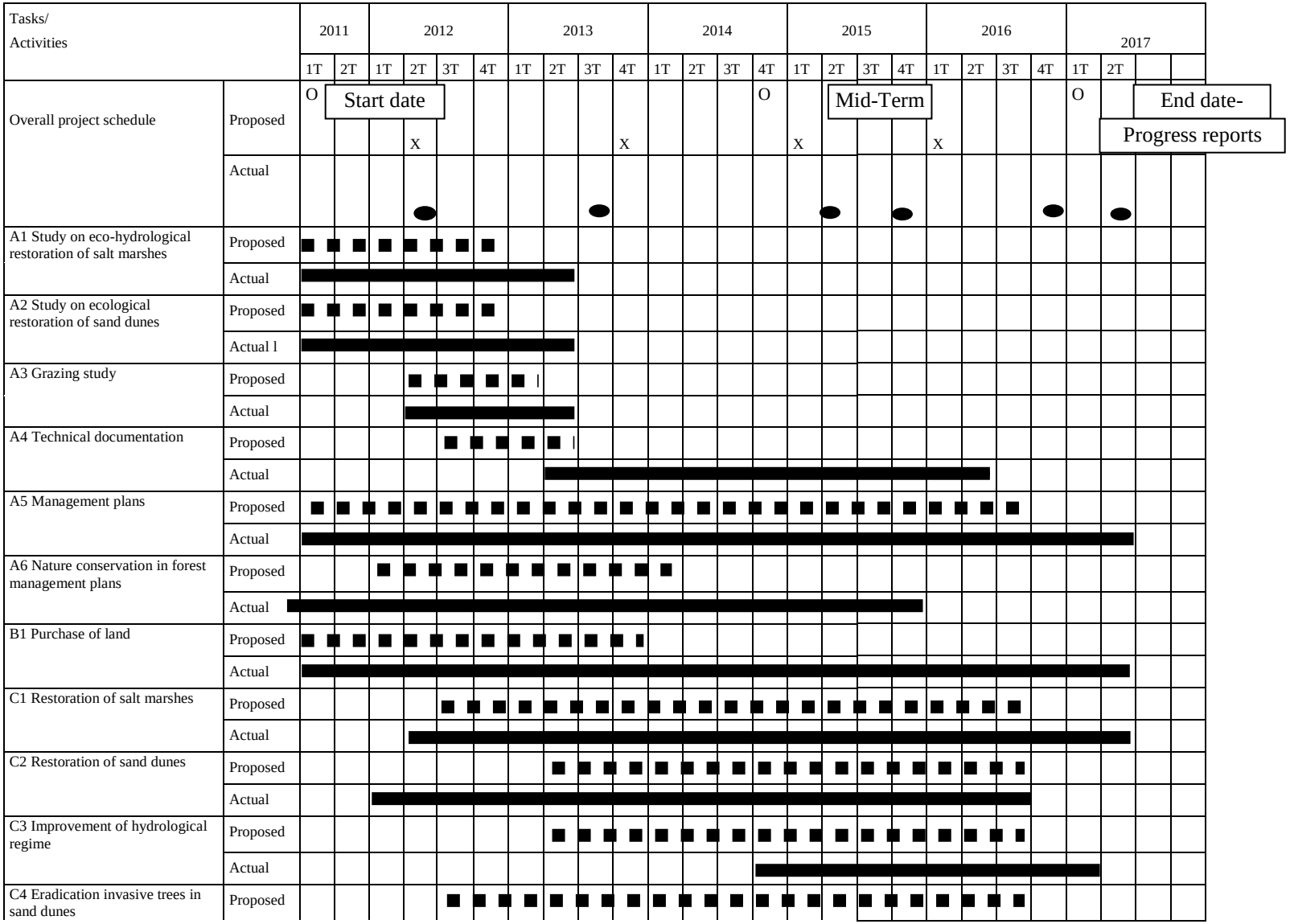
Networking with project "Restoration of habitats on sandy soils in southern Sweden - LIFE11 NAT/SE/000849 (SandLIFE)" from Sweden and project „Sandrasen im Dahme-Seengebiet" - „LIFE Sandrasen" from Germany was realised on 10th May 2017. Participants visited the project sites SCI Čenkov, Kamenínske slaniská and Marcelovské piesky. Project results were presented and discussed. The excursion was attended by 13 representatives of both projects and the discussions were very motivating for all participants. List of participants can be found as **Annex FR E4**.

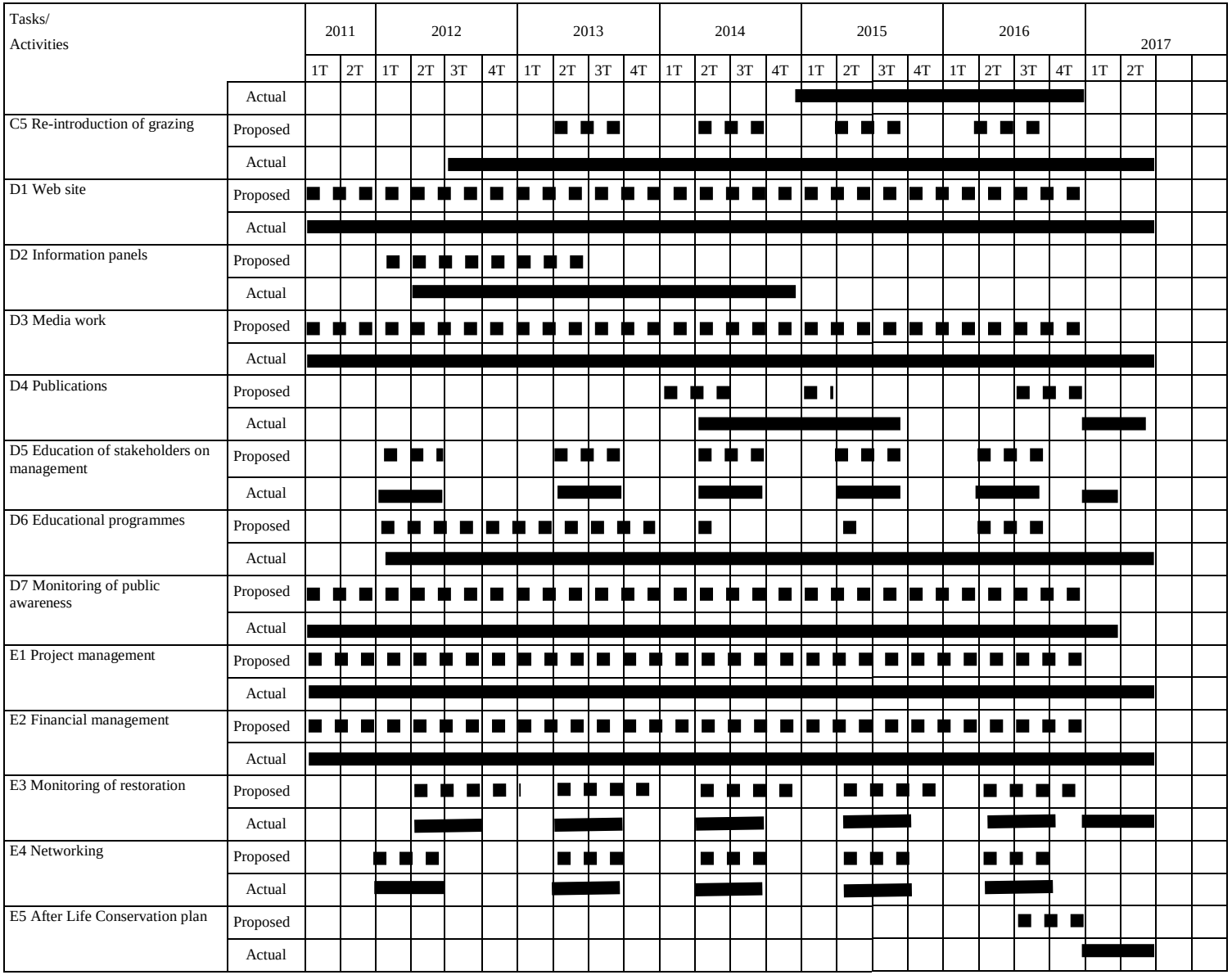
Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
Annex FR E4 List of participants at networking site visit

Planned actions are indicated in the Gantt chart used to illustrate progress. Dotted line indicates planned progress in the end of project.




Tasks/
Activities
2011
2012
2013
2014
2015
2016
2017
1T 2T 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T
Actual
C5 Re-introduction of grazing
Proposed
Actual
D1 Web site
Proposed
Actual
D2 Information panels
Proposed
Actual
D3 Media work
Proposed
Actual
D4 Publications
Proposed
Actual
D5 Education of stakeholders on management
Proposed
Actual
D6 Educational programmes
Proposed
Actual
D7 Monitoring of public awareness
Proposed
Actual
E1 Project management
Proposed
Actual
E2 Financial management
Proposed
Actual
E3 Monitoring of restoration
Proposed
Actual
E4 Networking
Proposed
Actual
E5 After Life Conservation plan
Proposed
Actual

5.2 Dissemination actions

There was ongoing communication with local population, mostly land owners, farmers and representatives of self-government by project team. This communication existed already in the initial project phase, when the project objectives were explained and commitment of relevant stakeholders was needed to be able restoring the sites valuable for the targeted habitats. Its importance is underlined by the fact that it is part of most of the actions and is important for sustainability of project results.

5.2.1 Objectives

The purpose was to raise awareness of local communities in the Danube Lowland region, providing them new information regarding conservation and value of priority habitats and strengthening the Natura 2000 network in the project area through the active protection of priority pannonic halophytic and psammophytic habitats of the Community importance. This action was implemented by means of the following types of activities:

1. The web site for general public www.perlypodunajska.sk is available also in the Hungarian language, which is important for the Hungarian minority living in the project area.
2. Information about project is available on www.daphne.sk/pannonicsk and www.daphne.sk/pannonicen. Special information related to implementation of project activities on particular sites was placed on web sites of 12 municipalities, information panels and posters with description of site/sites located in their vicinity in Slovak/Hungarian languages.
3. Meetings and presentations for landowners, land users, local/regional authorities and municipalities.
4. Training events and seminars for key stakeholders.
5. Educational toolkits for teachers “World of Salt Marshes” and “World of Sand Dunes”.
6. Training for teachers.
7. Environmental education at schools.
8. Information materials for general public available in Slovak/Hungarian languages.
9. Presentation in media and on conferences.

5.2.2 Dissemination: overview per activity

Action D.1: Web site development and maintenance (DAPHNE)

Description and outputs

The project website, as a special subpage of the existing site of project coordinator was created in Slovak and English languages. It contains information about the project, its aims, activities and results The website can be visited by accessing the following links:
www.daphne.sk/pannonicsk - Slovak language version
www.daphne.sk/pannonicen - English language version

Problems and their solutions/Modifications

No problems occurred.

Accordance with the timetable

The action was implemented in accordance with the project timetable.

Action D.2: Preparation and installation of notice boards and information panels (DAPHNE)

Description and outputs

Information panels: All permissions and approvals from owners of the land parcels, municipalities and other relevant administration offices required by Slovak legislation for installation of information panels were obtained. Overall 20 information panels in Slovak/Hungarian language with 16 different layouts were prepared, printed and installed in project localities (2 panels with the same layout were placed in SCIs Kamenínske slaniská, Marcelovské piesky, Šurianske slaniská, Nesvadské piesky). Layouts of 16 information panels were attached to the **PR2 Annexes D2/1a –o.** The information panels were appreciated by the visitors and we did not notice their damage. All are in good shape after the project was completed.

Info-sheets for municipalities: 15 infosheets about project localities in Slovak and 15 infosheets in Hungarian language have been prepared. Info-sheets were disseminated to all municipalities involved in the project. With the use of infosheets municipalities promoted the project localities via their local websites as well as via the regional websites.
Text and layout of 11 info-sheets in Slovak and 8 in Hungarian language were attached to the **PR1 Annex D2/4**. Text and layout of 4 infosheets in Slovak were attached to the **PR2 Annex D2/3** and 7 in Hungarian language to the **PR2Annex D2/4**.

Roll-up banners: Roll up banner with summary information about the project was elaborated, printed in 4 copies and provided to project beneficiaries. They have been used for project promotion at various events for public and stakeholders at different occasions. Layout of Roll up Banner was attached to **PR1 Annex D2/1.**

Posters: In total, 45 posters were printed (3 copies for each of 15 sites), laminated and distributed to municipalities in 3 districts within the project area (Nové Zámky, Komárno, Šaľa). All 45 posters produced since the project beginning were installed in schools, cultural centres and municipal offices. Finalised posters for 9 project sites were attached to the **PR1 Annex D2/5** and remaining 6 posters were attached to the **PR2 Annex D2/5.**

Problems and their solutions/Modifications

The process of fulfilling legal requirements for placement of 20 panels at different sites was long and very time-consuming. At some localities, due to very complex and unclear ownership the initially proposed localisation of panels has been changed and the process of obtaining necessary approvals was prolonged.

Accordance with the timetable

Implementation of this activity was extended till December 2014.

Action D.3: Promotion of the project via media and on the conferences (DAPHNE)

Description and outputs

Promotion of project via media

Directory of national and local media has been created for the purpose of project presentation and has been regularly updated. The first project press release was produced together with information about the project for journalists and press conference was organized during the Inception phase of the project, in February 2012 in close cooperation with MoE. The 2nd press release was distributed to media during implementation phase in October 2013. Scientific article on eradication of invasive tree species from sand dunes was published in per-reviewed journal, including promotion of LIFE project.

A list of all media outputs till November 2016 was summarised in **PR3 Annex D3_1**. A TV spot about project activities on SCI Kamenínske slaniská in cooperation with municipality of Kamenin village was broadcasted on 6 December 2015 in the main daily news on television JOJ (**PR3 Annex D3_2)**.

The press release "*Unique restoration of salt marshes in a village Kamenín*" **(PR3 Annex D3_3)** was prepared and distributed on 17 May 2016 to media together with an invitation to the Celebration of the Natura 2000 day in the village Kamenín (**PR3 Annex D3_5)**. The special event was realised on 19 May 2016 in cooperation with a village municipality. A special presentation of the ecological restoration of SCI Kamenínske slaniská was prepared. In total 44 guests, mainly representatives of media, project partners and stakeholders participated in the event (photo in **PR3 Annex D3_6)**. Results were published in 19 media web portals and one TV spot was broadcasted in the main news on Slovak Television on 31 may 2016 (outputs in **PR3 Annex D3_4**). Also, an article about project educational activities was prepared and published on July 2016 in the Slovak Environmental Journal "*Enviromagazin*" (**PR3 Annex D3_7**).

Press release (**FR Annex D3_1**) was distributed to local, regional and national media and press conference (**FR Annex D3_2**) was organised in cooperation with all project partners during the final project conference on 31st May 2017 in Patince. Project activities and main results were presented to the media and follow-up activities after the project end were discussed with representatives of various media groups (**FR Annex D3_3**). 7 media outputs were published (**FR Annex D3_4a to 4g**), one radio broadcasting was promoted via Slovak Radio (**FR Annex D3_4h**) and one TV spot about the project conference was broadcasted in national TV – RTVS on 4th June 2017 (**FR Annex D3_4i**).

Project was promoted also via the **European Union Regional Review** (**FR Annex D3_5**) which is the annual health review of the regions of Europe, focused on environmental policies, best practices in NATURA 2000 management, conservation, biodiversity, ecological issues and habitat protection/restoration. The article about PANNONICSK Project was produced for the 2016 Regional Review published on 3rd October 2016 in time for the European Week of Regions and Cities (10-13 October) at which over 6,000 regional, agricultural, rural affairs delegates attended. The strong story of the project and developed good practice appealed to a very large section of the audience responsible for conservation, ecological management, rivers, waterways, wetland and forest protection in all 260 European Regions. The entire European Parliament, European Commission and the entire European

Week of Regions and Cities has seen this presentation as 2,500 copies were provided to them personally and the Regional Review was put online at www.theparliamentmagazine.eu which is accessed by another 70,000 stakeholders per month.
The project has been well promoted via the local, regional and national media. Overall, 44 internet, 2 specialised, 2 general public articles in local and 1 in the international press were published, 2 radio broadcast and 8 TV spots were published.

Participation at conferences:

The project activities with focus on restoration measures were presented at The 8th European Conference on Ecological Restoration 2012 in September 9-14, České Budějovice, Czech Republic. Project was presented also on Natura 2000 Seminar of Continental, Pannonian, Black Sea & Steppic Biogeographical Region held on 29 June to 1 July 2015 in Luxemburg.

The project educational activities were presented at a few conferences and seminars (list till November 2016 was summarised in **PR3 Annex D3_8**). Project educational activities were presented at a conference in Podlesice on February 2016 in Poland. The conference was focused on outdoor education and more than 80 Eco-teachers from Poland and representatives of various organizations from European states participated in it (**PR3 Annex D3_9, PR3 Annex D3_10)**.

In August 2016 we participated in an ecoeducational workshop at Ecocenter Dropie organized by the Slovak Environmental Agency (24-26 August 2016) and an eco-educational market in Czech Republic (29 August 2016). At both events we distributed and promoted project educational materials (**PR3 Annex D3_11, PR3 Annex D3_12)**.

Project objectives and actions with special focus on management measures were presented at the international conference "Little Owl - Monitoring and Practical Conservation" on the 23rd March 2016 in Bartošovice, Czech Republic. The management of project localities had a significant positive impact on the local fauna species as shown for example on the Little Owl population in project region. Management measures were discussed in detail with 36 participants from 4 central European countries (**PR3 Annex D3_13**).

Project management measures with focus on eradication of invasive tree species were presented at the European Workshop on Control and Eradication of Invasive Alien Plant Species, organised by WWF Hungary in Budapest on 19-21 April 2016. Herbicide injection methods applied to eliminate Tree of heaven at sand dune localities were presented in detail and discussed with participants from various European countries. Abstract was reported in **PR3 Annex D3_14**.

Final project conference presenting project results and achievements was organised on 31st May – 1st June 2017 in Patince, southern Slovakia. The Agenda included presentations on management of salt marshes and sand dunes, implementation of best practices in cooperation with local farmers, the impact of management measures on target species and habitats, elimination of invasive species, new methods for implementation of Natura 2000 topics into school curriculum, etc (**FR Annex D3_6**). 65 participants discussed the impact of management on selected species of plants and animals as well as the possibilities for maintaining the favourable conservation status of target habitats in the future (**FR Annex D3_7**).

Information kiosks

Two information kiosks for public were organised on 3rd June 2017 in Bratislava (**FR Annex D3_8**) and on 7th June 2017 in Trnava (**FR Annex D3_9**), during the "Days of energy" coordinated by the electricity company ZSE. This company invited selected nature conservation projects and provided space for project promotion during these public events. At the kiosk, project materials for schools and public were distributed to visitors. People welcome information on endangered habitats and species as well as the initiative of project partners to save the valuable sites. Visitors discussed various aspects of the project and gave positive feedback on project materials.

The 5th project press release (**FR Annex D3_10**) was distributed to media in May 2017 at the occasion of organisation of excursion for teachers to project sites, where the valuable habitats were presented together with examples of activities through which the national curriculum can be taught directly with the example of Natura 2000 sites, habitats and species. Teachers from target villages appreciated such possibility and 2 media outputs were published about this event (**FR Annex D3_11a and 11b**).

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex D3_1 – press release 4
FR Annex D3_2 – press conference invitation
FR Annex D3_3 – press conference list of participants
FR Annex D3_4a to 4i – media outputs from press release 4
FR Annex D3_5 – Project paper in Regional Review
FR Annex D3_6 – Final Conference Agenda
FR Annex D3_7 – Final Conference list of participants
FR Annex D3_8 – Information kiosk in Bratislava
FR Annex D3_9 – Information kiosk in Trnava
FR Annex D3_10 – Press release 5
FR Annex D3_11a to 11b – Media outputs from press release

Action D.4: Publishing of information, educational and promotional materials (SNC)

Description and outputs

Brochures and posters promoting salt marshes and sand steppes were produced and printed in following copies: in Slovak (2,000 copies), Hungarian (2,000 copies) and English (1,000 copies) languages. Posters were printed in Slovak, 1,000 copies per each habitat. Brochures in Slovak and posters were attached to the **PR2 Annex D4_1** - **D4_4.** Brochures in English and Hungarian were enclosed as **MTR Annexes D4_2 - D4_5.** Printed copies of brochures and posters on salt marshes and sand steppes were attached to the **MTR AnnexD4**.

Hungarian version of the brochures was intended to the Hungarian minority leaving in vicinity of the project site and to Hungarian partners. English version will be distributed at international workshops, conferences and other international undertakings.

Promotion materials were distributed in accordance with the distribution list (attached as **MTR Annex D4_1**) as well as at various meetings, festivals and events around Slovakia. Based on great public interest in promotional materials, reprint of brochures and posters was done in June 2017 as follows:

- brochures in Slovak 2,000 copies for habitats of salt marshes and 2,000 copies for habitats of sand dunes
- brochures in Hungarian 1,000 copies for habitats of salt marshes and 1,000 copies for habitats of sand dunes
- brochures in English 1,000 copies for habitats of salt marshes and 1,000 copies for habitats of sand dunes
- posters in Slovak 5,000 copies for habitats of salt marshes and 5000 copies for habitats of sand dunes.

Overall following numbers of information brochures were printed:
In Slovak language: 4,000 copies of brochure and 6,000 copies of poster "Salt Marshes of Danubian Lowland" and 4,000 copies of brochure and 6,000 copies of poster "Sand Dunes of Danubian Lowland".
In Hungarian language: 3,000 copies of brochure "Salt Marshes of Danubian Lowland" and 3,000 copies of brochure "Sand Dunes of Danubian Lowland"
In English language: 2,000 copies of brochure "Salt Marshes of Danubian Lowland" and 2,000 copies of brochure "Sand Dunes of Danubian Lowland"

Project results were summarised in popular form into the Layman's Report (1,000 copies) printed at the end of the project (FR Annex D4_1). Electronic version of the Layman's Report is also available on CDs (150 pc, FR Annex D4_2).

Problems and their solutions/Modifications
No problems occurred.

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex D4_1. Layman's Report (printed)
FR Annex D4_2 Electronic version of the Layman's Report on CD

Action D.5: Education and training of key stakeholders on best practices on management of habitats targeted (BROZ)

Description and outputs

2 two-days trips and 4 one-day excursions for stakeholders were realised. 5 seminars for experts were realised. There were 83 meetings with stakeholders organised, with 298 participants in total.
Two-day trips: 2 two-days trips for stakeholders were realised, with 50 participants in total. The first one to *Duna-Ipoly NP, Hungary* and *SCI Čenkov (18-19/10/2012)*. Participants were

mainly the foresters. Examples of effective removal of invasive trees, using innovative methods were shown in Hungary. Its implementation at SCI Čenkov was discussed. Second trip was organised to *Hortobágy NP* and *SCI Kamenínske slaniská (17-19/10/ 2013).* The main target group of the excursion were farmers, who can be involved in restoration of grazing in project sites. Positive examples of cooperation of local farmers on restoration of grazing on salt marshes were shown in Hungary and very positive feedback received from participants.

One-day trips: 4 one-day excursions for stakeholders were realised on SCI Kamenínske slaniská, with 56 participants in total. The excursions were realised mostly for farmers interested in grazing on the project sites, as well as representatives of municipalities and regional environmental offices and relevant authorities. Examples of halophytic habitats and their management were shown on the site and their specific features explained, positive examples of cooperation with local farmers and municipality was presented.

Seminar for experts: 2 seminars for experts were realised on project sites and there was participation on 3 international seminars in Hungary and Czech Republic.

First seminar was organised on 15/5/2014 at *SCI Pavelské slanisko* for 14 participants. The participants were experts on nature conservation and habitat restoration, water management and project managers from different institutions. Specific features of salt marsh habitats restoration were presented and discussed. Advocating project activities among stakeholders and public, involving farmers in project implementation, were discussed as well.

Second seminar was organised on 9/6/2014 at *SCI Čenkov* for 24 participants. The participants were botanists, ecologists, entomologists, paleoecologists and geologists. The specific features of pannonic sand dune habitats, their use and resulting environmental problems, as well as activities planned in the course of the project were discussed.

International Seminar on Restoration of dry grasslands organised on 20-21/ 5/ 2015 in Györ with 37 participants was attended. The results and activities implemented and planned in the course of the project were presented and discussed. An important insight was gained mainly to restoration of grazing on sand dune habitats (especially concerning optimal grazing pressure and timing, grazing system, best animals for grazing) as well as novel methods of eradicating invasive tree species.

Project results and best practice methods were presented and discussed with various experts on grassland habitats restoration on an international conference “Pastva v krajině” on 13/3/2016 in Horka nad Moravou, Olomouc, Czech Republic (64 participants): the results of salt marsh and sand dune habitats restoration by grazing were presented and discussed.

19.-21/4/2016 Budapest, Hungary, European workshop on control and eradication of invasive alien plant species (57 active participants). The results of eradication of invasive plant species on salt marsh habitats, and their subsequent management by grazing focused on avoiding their re-spreading was presented and discussed on international forum of experts.

Meetings with stakeholders:

Altogether 83 meetings (298 participants in total) with relevant stakeholders were organised. The participants were mostly local farmers, representatives of municipalities, nature conservation offices, hunting associations etc. Several meetings were organised in cooperation with SNC.

<u>Problems and their solutions/Modifications</u>

N/A

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex D5: Photodocumentation and lists of participants (from one-day trips for stakeholders realised on 15.12.2016 and 15.6.2017)

Action D.6: Production of educational programmes for schools on habitats targeted (DAPHNE)

Description and outputs

Toolkits. The toolkits for teachers "World of Salt Marshes" and "World of Sand Dunes" (attached to the **PR2 Annex D6_1**) were created and printed in Slovak and Hungarian language in 2,000 copies. They were distributed among schools in the region, but also on the national scale, based on direct demand from school directors and experts. The toolkits have been evaluated by teachers, nature conservationists and experts as a unique tool for promotion of the rare habitats among young generation and also as a great support helping teachers to teach natural science subjects more interactively at their classes. Based on this positive feedback and great demand, we printed additional copies of the toolkits in Slovak language in order to distribute them to schools around Slovakia, to promote the valuable habitats of salt marshes and sand dunes. It was justified by the distribution list exceeding printed numbers in **MTR Annex D6_2**. We additionally printed 500 copies of "World of Salt Marshes" and 500 copies of "World of Sand Dunes" in Slovak language. Distribution list by the end of project can be found in the **FR Annex D6_1.**

Few copies of toolkits are left at Daphne archive and library for teachers and lectors of environmental education and for further promotion of project outputs at relevant occasions.

Identification keys on plants and animals of salt marshes and sand dunes were developed and printed in Slovak and Hungarian language. Identification keys were distributed together with toolkits.
Educational programmes for primary schools on both target habitats were developed in Slovak and Hungarian based on information in toolkits. Set of educational tools was developed in both languages. 28 educational programmes were implemented at 14 primary schools in 13 target municipalities, involving 588 pupils. Programmes were linked to opinion pool at primary schools (Action D7) and taught in both Slovak and Hungarian language. At the same time all educational tools developed within the project were included in content of DVD, which was part of the each toolkit for teachers.

The set of educational tools was delivered to Ecocentre Dropie, managed by the Slovak Environmental Agency and will be used in programmes on salt marshes and sand dunes offered by the Ecocentre.

Based on initial plan, toolkits and programmes contain information on the conditions and functions of the ecosystem of sand dunes/salt marshes and interesting information on selected species, chapter focused on main threats and possibilities of local people to get involved in the conservation of these valuable habitats. The main focus of toolkits is given to practical activities for primary school children in the form of worksheets easy to copy to enable teachers to use them repeatedly.

Workshops for teachers: During the project period 4 educational workshops and one workshop with field visit for teachers were organised with the aim to present the habitats of sand dunes and salt marshes, to demonstrate innovative approaches to teaching about nature conservation and to distribute toolkits "World of Salt Marshes" and "World of Sand Dunes" as well as identification keys **(PR3 Annex D6_1**) to teachers in project region and close surrounding. Two of them were organized by Methodology and Pedagogy Centre in Bratislava. The first workshop was organized on 12 November 2015 for 22 teachers (**PR3 Annex D6_2**) and the second on 26 November 2015 for 18 school directors (**PR3 Annex D6_3**). The third special interactive workshop "Perly Podunajska" organized by Daphne was realized on the 14 April 2016 in Ecocentre Dropie, near the village Zemianska Olča in cooperation with The Slovak Environmental Agency (**PR3 Annex D6_4, PR3 Annex D6_5, PR3 Annex D6_6)**. 22 teachers were informed how they can use toolkits in their practice and lot of practical activities were presented. Also a set of educational tools, created on basis of worksheets was presented to inspire teachers to develop their own sets of educational tools. In total 62 teachers participated in all three workshops. The 4th workshop took place in Komárno on 15th November 2016. We received very positive feedback on all 4 workshops and teachers requested additional practical workshop with field visits to salt marshes and sand dunes. The workshop with field visit, based on demand, was organised on 15th June 2017. Thanks to the possibility to use a rented bus, teachers visited various project localities and got detailed information about the project objectives, activities and results during the event. The invitations and lists of participants from last two workshops are provided in **FR Annex D6_2 - Annex D6_5** .

Excursions for schools and public: 30 excursions for students, teachers as well as public were realised in the project sites, with 544 participants in total. Most of the participants were from villages and towns located in and near the project region. Unique features of salt marsh and sand dune habitats were presented on the excursions, together with specific plant and animal species bound to them. The actual threats and actions implemented within the LIFE project to preserve these habitats were presented on the sites. The list of participants from the organised excursions as well as photodocumentation can be found in **PR3 Annex D6_7** and **MTR Annex D6_1**. The list of excursion realised within the project is stated in Table D5_1.

Table D5_1: List of excursions for schools and public realised within the project

Excursion number	Date	Site visited	Number of participants	List of participants annexed within
1	11.05.2012	SCI Mostová	12	MTR Annex D6_1
2	13.05.2012	SCI Čenkov	14	MTR Annex D6_1
3	29.05.2013	SCI Kamenínske slaniská	19	MTR Annex D6_1
4	30.05.2013	SCI Čenkov	16	MTR Annex D6_1
5	03.10.2013	SCI Panské lúky	19	MTR Annex D6_1
6	18.10.2013	SCI Čenkov	14	MTR Annex D6_1
7	19.05.2014	SCI Pavelské slanisko	32	MTR Annex D6_1
8	20.05.2014	SCI Čenkov	32	MTR Annex D6_1
9	14.10.2014	SCI Šurianské slaniská	18	MTR Annex D6_1
10	15.10.2014	SCI Nesvadské piesky	16	MTR Annex D6_1

11	05.05.2015	SCI Panské lúky (Ráczovo	26	MTR Annex D6_1
12	06.05.2015	SCI Panské lúky (Ráczovo	17	MTR Annex D6_1
13	07.05.2015	SCI Panské lúky	15	MTR Annex D6_1
14	11.05.2015	SCI Jurský Chlm	12	MTR Annex D6_1
15	21.05.2015	SCI Pavelské slanisko	20	MTR Annex D6_1
16	22.05.2015	SCI Čenkov	19	MTR Annex D6_1
17	05.06.2015	SCI Panské lúky (Ráczovo	14	MTR Annex D6_1
18	18.06.2015	SCI Pri Orechovom rade	23	MTR Annex D6_1
19	19.06.2015	SCI Pri Orechovom rade	17	MTR Annex D6_1
20	24.06.2015	SCI Pri Orechovom rade	27	MTR Annex D6_1
21	27.06.2015	SCI Mostová	22	MTR Annex D6_1
22	19.05.2016	SCI Pri Orechovom rade	15	PR3 Annex D6_7
23	20.05.2016	SCI Pri Orechovom rade	12	PR3 Annex D6_7
24	25.05.2016	SCI Pavelské slanisko	13	PR3 Annex D6_7
25	26.05.2016	SCI Čenkov	11	PR3 Annex D6_7
26	29.05.2016	SCI Marcelovské piesky	19	PR3 Annex D6_7
27	30.05.2016	SCI Panské lúky	18	PR3 Annex D6_7
28	09.06.2016	SCI Panské lúky (Ráczovo	15	PR3 Annex D6_7
29	10.06.2016	SCI Panské lúky (Ráczovo	17	PR3 Annex D6_7
30	12.06.2016	SCI Mostová	20	PR3 Annex D6_7
Total number of participants			**544**	

Accordance with the timetable

The action was implemented in accordance with the project timetable.

Annexes of the action

FR Annex D6_1: Distribution list of toolkits in Slovak and Hungarian language
FR Annex D6_2: Workshop for teachers November 2016 – invitation
FR Annex D6_3: Workshop for teachers November 2016 – list of participants
FR Annex D6_4: Workshop for teachers June 2017 – invitation
FR Annex D6_5: Workshop for teachers June 2017 – list of participants

Action D.7: Monitoring of public awareness activities on targeted groups

Description and outputs

Website: The structure of web site for general public and its design was finalised. It was open for public in Slovak and Hungarian language. The link is: www.perlypodunajska.sk. Project dissemination materials are available for public on the web page. It had 9,720 visitors by the end of February 2018 and the web page is actively used. This number is almost doubled comparing to the indicator in the project document.

Opinion pool: The questionnaire has been elaborated in close cooperation with – the Forum Minority Research Institute. First round of questionnaires – opinion pool in 14 municipalities in 3 target districts - was realised in order to identify and quantify the knowledge about and attitude of local people to the particular project site before the information and promotion activities of the project are implemented. Opinion pool was gender and aged balanced. 150 questionnaires were evaluated and results are shown in the summary report **(PR1 Annex**

D7). The results of the first opinion pool supported the project PR strategy with the main focus on younger generation – school children/youth and their parents. The same number of respondents (150 questionnaires) was interviewed at the end of the project period to compare the local knowledge before/after the main public awareness activities were implemented and results can be found in **FR Annex D7_2**.

The public opinion pool confirmed that the local inhabitants perceive targeted sites as habitats with great natural value, high potential and urgent need for further utilization. The number of respondents knowing project sites increased during the project implementation; however the main increase was recorded in respondents gaining information from other persons/sources and not from direct visit at project site. It reflects the project communication and dissemination strategy, which was focused mainly on information materials and public events located away from valuable project sites (mainly in settlements, at schools, online materials, etc.). The project sites and rare habitats are known especially by respondents in the age group over 55 and with university degree. The uniqueness of project localities is known by more than half of the inhabitants of local settlements. The respondents who visited localities are most aware of their uniqueness and need for protection, therefore we organised additional workshop for teachers with field visits to project sites (Action D6). The number of respondents satisfied with status of target sites increased during the project implementation. For the future utilization of target localities, 71% of respondents prefers recreation or nature friendly management, what reflects positive attitude of local people to project sites.

Opinion pool at schools: First and second round of questionnaires – opinion pool in 11 schools in 9 municipalities in 3 target districts - has been realised in order to identify and quantify the knowledge about and attitude of local primary school pupils to targeted Natura 2000 sites before and after the educational programme was implemented. 724 questionnaires have been evaluated and results were shown in the **PR2 Annex D7**. Majority of pupils had weak knowledge, which was improved markedly after implementation of the educational programmes.

The impact of organised excursions under action D5: the qualitative and quantitative impact of the organised excursions on target stakeholders are evaluated in **FR Annex D7_1**. Based on the evaluation of questionnaires filled by the participants, it can be concluded, that the excursions were successful in disseminating the desired information and practical examples to the target audience in an interesting way and increasing their understanding of the desired topics. The participants considered the activities realised within the project as meaningful and beneficial for the target habitats, local farmers, and neighbouring communities and also to increasing the potential of the project region for tourism. More than 76% of the participants expressed their will to cooperate on implementing the project actions, should it be in their competence. Moreover, the excursions for stakeholders have contributed to decision of one of the local farmers, who participated on them to cooperate on reintroduction of grazing on project site SCI Šurianske slaniská – on an area of more than 70 ha. This significantly contributed to meeting the project objectives within action C.5.
When compared with the expected results in the project proposal, it can be concluded, that the expected numbers of participants were achieved by 100% and 130% for 2-day and 1-day excursions, respectively and exceeded by 596% for meetings with stakeholders. The structure of participants from different stakeholders groups was evaluated as appropriate

for effective communication and dissemination of the topics required for smooth project implementation.

Problems and their solutions/Modifications
Proposed decrease of 1 400 evaluated questionnaires in municipalities to 700 was approved by the EC letter from 1st August 2014 (ARES 2556371).

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex D7_1 - Evaluation of quantitative and qualitative results and impacts from organized excursions within the project action D.5.
FR Annex D7_2 Results of opinion pool

Action E.5: After- Life Conservation Plan

Description and outputs

The main After-LIFE objective is to ensure the sustainability of the conservation measures taken during the project and further improve conservation status of targeted habitats at the site level. The project partners planned how to continue necessary project actions, outline the framework and timetable for the implementation of the actions, and the suggested or definite source of funding. The After-Life plan addresses the conservation issues in the following thematic categories:
1. Habitat conservation
2. Policy and legislation
3. Monitoring
4. Dissemination and awareness

Problems and their solutions/Modifications
There were no problems with implementation of this action.

Accordance with the timetable
The action was implemented in accordance with the project timetable.

Annexes of the action
FR Annex E5 After LIFE Conservation Plan

5.3 Evaluation of Project Implementation

Project objectives were implemented according the overall project goals and main results were achieved beyond the planned results. Project team have established active contacts with the key land owners and land users, built good reputation within stakeholders and public in the region and effective cooperation with local farmers on management of the project sites. The best fitting and efficient methods were selected.

Realised **restoration management** on project sites was very efficient. Removing trees and shrubs resulting from the secondary succession was the first step. Long-term abandonment has led to establishment of ant hills, which were levelled. Following mulching or mowing was focused on removal of plant biomass and cleaning of grasslands. Harrowing was applied on some sites to promote rejuvenation of species typical for target habitats. Where necessary (e.g. when suppressing invasive or dominant plants, mowing), the restoration management was carried out repeatedly (and often in combination with grazing).

Restoration of grazing – one of the most significant successes of the project was establishing a very effective cooperation with local farmers and communities – who are responsible for grazing on 8 of 11 project sites, where grazing was restored. Since they live much closer to the project sites and have better knowledge of local conditions, they can secure grazing on project sites much more effectively – especially on the more distant and remote sites.

Very successful stem injection method was used for **eradication of *Ailanthus altissima***, even not originally planned in the project document. This method was proved as very effective in producing stem mortality in a short time. *Ailanthus altissima* stems were monitored for the stem injection effectiveness two weeks after treatment by the SNC staff. Significant signs of deterioration of trees (dry leaves, stems and sprouts) were visible. Monitoring of the stem injection effectiveness was also realized by the Institute of Botany SAS using 4 permanent plots of the size 20x20 m for evaluation of *Ailanthus altissima* treated individuals mortality and for evaluation of recovery sandy habitats. The results of 3 years monitoring documented very high mortality of treated individuals (about 90%) and appearance of some typical sandy species like *Arenaria serpyllifolia, Cynoglossum hungaricum, Melica ciliata, Onosma arenaria.*

Creation of clay barriers to stop drainage of 2 sites has proven to be less effective that supposed by using of geological drills. **Filling of drainage channel** was proposed finally and was realised. When planning a project, we feared to propose such activity, but due to very good cooperation with local community it became a reality.

The project proposal included providing of water supply for soil by groundwater pumped up by **wind water pumps**. This activity aimed primarily at improving the water regime of saline habitats by enabling gradual evaporation of the water and thus increasing the salinity at local terrain depressions. The secondary aim was to provide water for the grazing cattle and sheep. This measure was not recommended by the Study on eco-hydrological restoration of salt marshes, as its impact would not be significant. It is highly probable, that salts would be washed out of the surface into deeper horizons and finally into groundwater.
Using of the wind-powered water pumps to supply water could be also considered as innovative solution in our national conditions. The wind-water pumps are the best option for pumping of the water for grazing cattle due to fact that in all specified locations providing of

pumping using electricity as a power drive would be too difficult, as the nearest access points to a.c. power network is few hundreds of meters away. Another advantage of the wind-powered solution is the very cheap and environment-friendly operation of the pumping system.

By implementation of restoration management and re-introduction of regular management (mostly grazing) on most of the sites, a great conservation benefit for targeted habitats and rare species was observed. For example, strictly halophytic and critically endangered species as *Trifolium angulatum, Carex divisa, Chenopodium chenopodioides, Crypsis aculeata, Hordeum geniculatum, Plantago tenuifolia, Lythrum tribracteatum, Heleochloa schoenoides* were found on new sites and their populations were increased.

Gaining of trust of local farmers was not easy at the beginning. After analysing the situation, following factors can be identified as crucial for **effective cooperation with local farmers/stakeholders**:

1. Intensive communication, especially personally and on the site. Farmers don´t prefer emails and communicating by phone is often not as effective.
2. Positive examples – presenting positive examples and success of farmers who already participate on the project was a strong tool, that helped to persuade hesitating farmers to cooperate. Here, the 2-day excursions with positive examples in Hungary were especially helpful.
3. Networking. Farmers in the region often know each other. When we were seeking for cooperation on new sites, it was often best to ask the farmers who already participate on sites where grazing is established and often they could recommend us good contacts to start new cooperation.
4. Listening to the needs of farmers, accepting their requirements when possible.
5. Creating robust solutions – especially when constructing grazing infrastructure (fences, watering devices, shelters for animals) – high durability is required to prevent failures and to build reliable and trustworthy cooperation.
6. Providing help when needed (e.g. with necessary permissions, for preventing or solving conflicts, etc.).
7. Frequent visits to the project sites – to have good idea of what is happening at the project sites. Also, for sand dunes habitats, this is important to prevent overgrazing.

The overall results of monitoring of impact of public awareness activities confirm that in-depth information and dissemination activities (meetings, workshops, seminars, programmes, etc.) have more significant influence on knowledge, skills and opinion of local people, than indirect communication via information boards and websites. The increase in awareness of local people on Natura 2000 network, project habitats, sites, their threats and conservation was recorded, however the difference was much larger in in-depth dissemination activities, than in indirect communication. Our experiences show, that the most significant dissemination tool is direct visit/excursion of target groups at project sites, however this method is the most expensive and time-consuming at the same time and therefore can be provided only for a limited number of local people and stakeholders.

There were also some factors, which were identified as drawbacks, which hampered or complicated the implementing of project actions:

Bad design of SCI borders – especially SCI Juhászove slance consists of 4 fragments – 3 of them with virtually no access road – with access only through arable land used by local farming cooperative.
SCI Jurský Chlm – the site has very jagged borders – consisting of stripes of degraded grassland habitats interspersed with stripes of arable land. Providing sustainable management of grassland habitats in such conditions is very complicated (if not impossible).
Proposed solution: when designing new protected areas – this should be considered. The borders should be compact, with reasonable access. Also, for grassland habitats where grazing should be the optimal method of long-term management – the site should be sufficiently big (and compact). Of course, in some areas the target habitats may not be as big or compact to fulfil these criteria. A good solution for such cases is to include also surrounding areas, which would work as buffer zones. E.g. when preserving grassland habitats – to include also neighbouring overgrown areas. Here, the animals often spend more time than on grasslands (e.g. for resting, shade or cover from wind), which reduces the pressure of eutrophication on the valuable core areas. When effectively managed, the buffer zones can also provide new habitat for target species (e.g. psamophytic species *Achillea ochroleuca* and *Silene conica* colonised relatively fast the areas cleared from black locust and included in the grazed part of SCI Chotínske piesky).

Table 3: Comparison of the results achieved against the objectives

Task	**Foreseen in the revised proposal**	**Achieved**	**Evaluation** – description of successes (S) and lessons learned (LL) and problems (P)
A1	Study on eco-hydrological restoration of salt marshes	Study provides the overview on the best and most effective ways for understanding and restoration of salt marshes functions, eg. increasing of capillary forces, which help bring salt water closer to surface.	LL: Considerable effort was developed to understand functioning of salt marshes. New approaches for restoration of salt march habitats were proposed and tested.
A2	Study on ecological restoration of sand dunes	Study provides the overview on the best and most effective ways to eliminate invasive species was done and proposed for implementation..	S: new approaches for elimination of invasive trees were proposed and tested. Previous use of mechanical control and cut-stump herbicide application proved to be ineffective. The most effective technique lance injection system was proposed, tested and implemented. LL: it was valuable to consider also other solutions for meeting the project aims than those proposed in the project proposal
A3	Study on habitats restoration and management by grazing	The most suitable animal breeds for restoration, as well as recommendations for maintaining proper care for animals were recommended in the study.	S: new approaches for restoration of salt march habitats were proposed (i.e. employing of different types of animals than originally planned) – resulted in more effective restoration of salt marsh habitats by grazing LL: it was good to consider also other solutions for meeting the project aims than those proposed in the project proposal
A4	Constructing documentation and permission	Constructing documentation and permission for hydrological restoration of salt marshes was obtained, including	LL: Proposed increasing of water table by underground clay barrier on two sites proved to be ineffective and was not realised.

		filling in the drainage channel with about 5,000 m^3 of soil over a distance of 450 m.	S. Removal of drainage channel at Kamenínske slaniská was not planned because it was an unachievable goal in that time. Due to very good cooperation with local municipality and respective authorities, the permit to remove the drainage ditch was acquired.
A5	Management plans for 15 SCIs	Management plans for 15 SCIs were prepared and approved, representing a key tool for maintaining the project results.	P: Complications concerning the implementation of the action were caused by changes of the national legislation and very complicated approval procedure. LL: There is very low probability to influence legislative and administrative processes, which are outside the project's impact.
A6	New Forest management plans for 2 SCIs with integrated measures for the conservation of sand dunes habitats, elaborated, approved and implemented.	In total an area of 66 ha was included as functional areas (compared to 8 ha as planned) into the two FMPs. Nature conservation measures integrated into 2 approved FMPs	S: Main results were achieved beyond the planned results and are unique on the national scale. LL: Involvement and communication with foresters from the beginning, proposals based on the results from the field inventory realised within the project
B1	50 ha of land in project sites acquired in total, 30 ha of this purchased and 20 ha long-term leased.	Within the project, 78.34 ha of land was purchased and 27.5 ha of land was acquired by long term lease.	S: Main results were achieved beyond the planned results. LL: intensive communication with land owners is important to gain trust of land owners. Where necessary, it is good to assist with administrative issues (heritage processes administration, sales/lease contract preparation).
C1	Restoration management realised on 379 ha of salt meadows. 2 ha of this mowed manually.	Restoration management was carried out on a total area of 379 ha – on 9 sites of salt marshes. Additionally, 15.6 ha of	S: restoration of the expected area of salt marsh habitats was implemented on those project sites, where the results could be achieved most

		salt marsh sites, which were disturbed by ploughing before the start of the project were returfed.	effectively, with sustainability and synergy with other project actions (C3, C5) LL: intensive communication with local stakeholders, land owners and users was very important P: on some sites it was not possible to implement C1 and/or the results would not be sustainable.
C2	Tree barrier will be removed (some 92 trees on area of cca 1.28 ha); soil barrier on area of 0.2 ha removed (cca 2000 m^3 of sand); excavation of surface level (some 1213 m3 of soil); mowing, harrowing and mulching applied on area of 14 ha; two illegal waste dumps at the 2 SCI sites Nesvadské piesky and Marcelovské piesky will be removed.	Tree barriers consisting of 732 black locust individuals were removed; soil barrier on area of 0.2 ha (2000 m^3 of sand) and soil substrate (cca 1213 m^3 of soil) were removed; Mowing and harrowing was implemented on area of 9.81 ha; waste dumps removed from 2 SCIs from an area of 3.1 ha; invasive tree species were removed from an area of 13.57 ha.	LL: intensive communication with local stakeholders, land owners and users was crucial. It helped to motivate local communities to participate on invasive tree species removal by voluntary participation of unemployed people.
C3	Creation of 50 small scale depressions (total area of 2 ha according Restoration plan), clay barriers on the total length of 750 m and installation of 14 wind water pumps installed and used for watering and/or watering livestock	Restoration of the salination process by the top soil removal was realised on 3 ha of salt marshes on 6 project sites. Water regime was improved on SCI Kamenínske slaniská by filling-in of drainage ditch in length 450 m. At SCI Bokrošské slanisko a small drainage ditch was filled on the length of about 40 m. To support grazing on some of the project localities, 6 wind-run water pumps were installed on 4 project sites.	LL: Restoration of salt marshes by top soil removal has significant level of innovation. It was used in situations, when top soil layer was deteriorated by different farming activities and it caused the soil salinity decrease. Survival of salt tolerant plants depends on infiltration of salty water close to surface, but if the soil structure was destroyed, lower capillary pressure cannot transport water. We have tested depth of soil layer with sufficient salinity in each site and based on these measurements we planned extent and depth of restoration measure.

C4	Alien invasive tree species removed from area about 60 ha	In total, *Ailanthus altissima* was eradicated from the area of 123 ha (122.78 ha at SCI Čenkov and 0.22 ha at SCI Nesvadské piesky – part Líščie diery). Simultaneously additional dispersed fertile individuals (more than 4, 300) from the area of about 200 ha were eradicated.	S: Main results were achieved beyond the planned results. S: Using of this method became mandatory on the national scale, according to the Regulation of the Ministry of Environment No. 24/2003 Coll, which was based on the experience gained from the project.
C5	Grazing regime re-established on the area of min. 350 ha, grazing, animals purchased – sheep (300), goats (100) and grazing system established, 5.5 km of movable electric fences, 2.8 km fixed fences established, 13 shelters for animals constructed, 14 drilled water wells for animal watering (drinking) places established	Grazing was restored on 350.2 ha of project sites - altogether on 11 sites. Following grazing infrastructure was obtained: 42 km of fixed fences, 6 shelters for grazing animals, 12 watering wells and 5 km of mobile electric fencing. A mobile herd of 99 sheep was purchased. 77 cows (calves) and 5 water buffaloes (calves) were purchased and provided for local farmers and communities for restoration and long-term keeping of grazing on the project sites	LL: • intensive cooperation with local farmers was crucial for success of this action – it is also very important for sustainability of grazing system introduced on 11 project sites. P: on some sites it was not possible to reintroduce grazing and/or the results would not be sustainable. S: reintroduction of grazing was implemented on those project sites, where the results could be achieved most effectively, with sustainability and synergy with other project actions (C1, C2, C3, C4)
D1	The project web page developed, maintained and promoted during the whole project period.	The project website www.daphne.sk/pannonicsk was maintained in Slovak/English languages.	S: The website has been a useful tool in order to widely disseminate and raise awareness of the project itself. Documents such as brochures and publications were uploaded as they became available and they were used and appreciated by stakeholders.
D2	20 information panels produced and placed on project sub-sites,	Four project roll-up banners were printed. Overall 20 information panels in	P: Project roll-up banner, information panels, posters and infosheets were used to promote

	information on project and project sub-sites placed on web page of 12 municipalities, 4 Roll Up Banners on project objectives, 45 laminated posters on project sub-sites printed, laminated and placed in the local municipalities.	Slovak/Hungarian language with 16 different layouts were prepared, printed and installed in project localities. In total, 45 posters were printed (3 copies for each of 15 sites), laminated and distributed to municipalities. They were installed in schools, cultural centres and municipal offices. 15 infosheets about project localities in both, Slovak and Hungarian language were prepared and places on websites of local municipalities.	project. This approach was the most efficient for mostly remote projects sites. LL: The process of fulfilling legal requirements for placement of 20 panels at different sites was very time-consuming. At some localities, due to unclear ownership the initially proposed localisation of panels was changed and the process of obtaining necessary approvals was prolonged.
D3	Project presented on 6 conferences, 2 project press conferences organized, 5 press releases produced, 5 popular articles for newspapers and magazines prepared, 1 final project conference organized.	Five press releases were prepared within the project and two press conferences were organised. Project was presented at 6 international conferences. The project was promoted via the local, regional and national media. Overall, 44 internet, 2 specialised, 2 general public articles in local and 1 in the international press were published, 2 radio broadcast and 8 TV spots were published. Additionally, two information kiosks for public were organised in Bratislava and Trnava.	S: Main results were achieved beyond the planned results. LL: It was very valuable to have chance to organise the final project conference with participation of experts working with targeted habitats and their related biodiversity. Several zoologists participated on the conference and presented ecological requirement of specific and usually very rare monophagous species, which were influenced by the project restoration activities and which are monitored by them. Mutual exchange of information was important for maintaining and set up of management on project sites after the end of the project.
D4	Brochure on salt marshes - 2000 copies of in Slovak, 2000 copies in	The information brochures were printed in Slovak (4,000 copies per habitats of	S: Promotion materials were distributed in accordance with the distribution list at various

	Hungarian, 1000 copies in English. Brochure on sand steppes - 2000 copies of in Slovak, 2000 copies in Hungarian, 1000 copies in English. 1000 copies of poster on salt marshes, 1000 copies of poster on sand steppes 1000 copies of Layman´s report printed and 150 copies on CD.	salt marshes and 4,000 copies per habitats of sand dunes), Hungarian (3,000 copies per habitats of salt marshes and 3,000 copies per habitats of sand dunes) and English (2,000 copies per of salt marshes and 2,000 copies per habitats of sand dunes) languages. Posters were printed in Slovak - 6,000 copies per habitats of salt marshes and 6,000 copies per habitats of sand dunes. Project results were summarised in popular form in the Layman's Report. It was printed 1,000 copies and electronic version is available on CDs (150 pcs).	meetings, festivals and events around Slovakia. Based on great public interest in promotional materials, reprint of brochures and posters was done.
D5	2 two-days trips for 25 persons, 4 one-day trips for 5-15 persons, 5 seminars for 25+ persons, 15 meetings with stakeholders (estimated number of participants 50+)	• excursions and field meetings – 30 excursions for 544 pupils and students, mainly from towns and villages in the vicinities of the project areas; 2 two-day (50 participants) and 4 one-day (56 participants) excursions, and 83 field meetings (altogether 298 participants) mainly for farmers and representatives from municipalities and state offices. • 5 seminars for experts (mainly botanists, zoologists, geologists and environmentalists) with the aim of exchanging experience and knowledge from the fields of ecology and restoration of the target habitats;	LL: • 2-day excursions for stakeholders were evaluated as a very effective tool for increasing their motivation to cooperate on project actions • 1-day excursions were very useful for presenting successful grazing systems already realised within the project – to gain trust of other farmers and their motivation for cooperation • local farmers were the most important target group, here also the results achieved in communication were very good (i.e. investing the effort was rewarded with more effective implementation of C-actions)

D6	Production of 300 copies of toolkit for teachers about salt marshes, 300 copies of toolkit about sand dunes. Production of identification keys of salt marshes and sand dunes species – 2 x 500 pcs. 4 seminars for basic school teachers organized. Minimum of 30 guided excursions for schools and public organized.	• 2 methodological manuals in 3,000 copies were printed. "The world of salt marshes for young explorers" and "The world of sands for young explorers" (in Slovak and Hungarian), in the form of 74 worksheets, including animal and plant identification keys and a CD; the CD is comprised of educational tools such as a poster, cards with drawings of selected plants and animals, and a guide for teachers on how to work with the manuals; • 28 education programmes for 588 pupils of the second level of primary education from 14 elementary schools in 13 towns/villages; • 6 one-day education seminars for 131 teachers entitled "The pearls of the Danubian region" focused on presenting issues related to salt marshes and sand dunes; teaching tools and activities for teachers' use in classes were presented at these seminars.	Excursions for schools and public LL: • keep the topic understandable: when presenting, using simple and understandable examples is very helpful • employing of participants is good to keep their attention and focus (i.e. by questions, small competition...) S: The toolkits have been evaluated by teachers, nature conservationists and experts as a unique tool for promotion of the rare habitats among young generation and also as a great support helping teachers to teach natural science subjects more interactively at their classes. Based on this positive feedback and great demand, we printed additional copies of the toolkits in Slovak language in order to distribute them to schools around Slovakia, to promote the valuable habitats of salt marshes and sand dunes..
D7	Special website with at least 5,000 visitors, 1,400 evaluated questionnaires in municipalities, 6 times evaluated questionnaires	Special website for general public was visited by 9,720 visitors. This number is almost doubled comparing to the indicator in the project document.	S: Main results were achieved beyond the planned results. The number of visitors of project web page is almost doubled comparing to the indicator in the project document. The page is popular and actively

	from organised trips, and 5 times evaluated questionnaires from organised seminars.	The opinion pool at schools was realised before/after the educational programme was implemented. 724 questionnaires were evaluated. The opinion pool - 150 questionnaires at the beginning and 150 questionnaires at the end of the project – was realised Questionnaires from trips and seminars were evaluated.	used. LL: To realised opinion pool for the project which is not in the place focused on general increasing of awareness is not the best fitting method. Our project worked with special stakeholders mainly and opinion pools realised with direct participants on our project would be more focused and relevant.
E3	It was planned to produce monitoring reports on hydrology and grazing yearly, pedological monitoring before and after restoration, and monitoring of vegetation at the beginning and end of the project.	Hydrological monitoring was reduced and was realised on 1 site to monitor the effect of the filling in of drainage channel. Yearly monitoring reports were skipped and final monitoring report was delivered at the end of the project, including databases. Additionally to project plan, the impact of eradication of invasive species on vegetation and robust monitoring of top soil removal were realised.	S. The monitoring actions done in the project proved that our restoration actions were successful on majority of sites. P: The project period was found to be a bit too short to reveal clear response but it is safe to assume that the flora and vegetation will benefit from the actions on longer term.
E4	Estimated number of meetings: 3 in total; Estimated number of participants: max. 15 per meeting max. 45 in total	6 networking meetings were realised.	Networking provided very useful insights and new solutions to implementing of project actions (C1, C4, C5, D5).
E5	After-LIFE Conservation Plan	After-LIFE Conservation Plan was prepared.	LL: It is very useful tool to plan continuation of relevant

5.4 Analysis of long-term benefits

1. Environmental benefits
   a) Direct /quantitative environmental benefits:

Conservation benefits for Natura 2000 (SCI) and species/habitat type targeted.
Targeted habitats – sand dunes and salt marshes belong to the most threatened, fragmented and already very rare communities, which are on the edge of its distribution. Understanding of ecological functioning of those systems was very weak before starting of the project and there was no management realised on 14 project sites, out of 15. Within preparatory actions 3 studies (actions A1 – A3) were prepared with summarisation of existing knowledge on best management and restoration techniques on national and international context. Additionally, intensive pedological field survey including field measurements and collection of samples for laboratory analysis was realised to be able to define restoration of potential sites where the conditions in the upper soil layer changed.
The best fitting and efficient methods were selected; some methods for hydrological restoration were also tested. Creation of clay barriers to stop drainage of 2 sites has proven to be less effective that supposed by using of geological drills. Filling of drainage channel was proposed and implemented. When planning a project, we feared to propose such activity, but due to very good cooperation with local community it becomes a reality. By implementation of restoration management and re-introduction of regular management (mostly grazing) on most of the sites, there is a great conservation benefit for targeted habitats and rare species. For example, strictly halophytic and critically endangered species as *Trifolium angulatum, Carex divisa, Chenopodium chenopodioides, Crypsis aculeata, Hordeum geniculatum, Plantago tenuifolia* were found on new sub-sites and their populations were increased.
According to the Slovakia Report on Article 17 of the Habitats Directive for the period 2007-2012, salt marshes habitats (1340*, 1530*) were evaluated as 100% unfavourable bad status assessment (U2) and sand dunes (6260*, 6120*) were evaluated as 100% unfavourable inadequate status (U1).
Monitoring of habitats of European significance in the Slovak Republic was realised and assessed for the period of 2013 – 2015 and for targeted habitats can be found in Table 4.

Table 4: Assessment of targeted habitats within national monitoring system http://www.biomonitoring.sk/

Habitat code/Habitat status	favourable status (FV) in %	unfavourable inade-quate status (U1)) in %	unfavourable bad (U2)) in %
1340*	23	67	10
1530*	20	40	40
6120*	48	45	7
6260*	46	41	13

The most significant positive changes compared to the report on habitat status were observed in case of salt marshes, which had 100% unfavourable bad status assessment. This

is related to increased level of knowledge and data quality, as well as to the renewed measures implemented under the project LIFE10NAT/SK/083.

Policy implications

Innovative and in national context still very rare and realised on biggest scale is the creation of functional plots for protection of open sand dune habitats within forest management planning process, which was successfully realised on SCI Čenkov within activity A6.

According to the § 54 of Nature Conservation Act, the Forest Management Plan (FMP) is also considered as a nature conservation document. It is not approved by the nature conservation authority, but the state forest management authority (§ 41 of Act No. 326/2005 Coll. on Forestry, as amended). FMP is not prepared by a competent person under § 55 of the Nature Conservation Act, but by a competent person designated by the Ministry of Agriculture or a legal person whose founder is the Ministry of Agriculture. To include nature protection requirements into FMP is quite complicated and they are often not accepted on a national scale. In the case of our project, these requirements were accepted.

The stem injection method verified in this project was implemented in the national legislation (amendment to the Order of the Ministry of Environment of SR number 24/2013), as the only one suitable for the Ailanthus altissima eradication.

2. Long-term benefits and **sustainability**

a) Long-term / qualitative environmental benefits

Restoration management was realised within the project. Re-introduction of regular management is done mostly in cooperation with local farmers. Increasing of their awareness and assistance with administrative obstacles helped to overcome psychological barrier, that it is not possible to do farming within protected areas. By their involvement, long term management of most of the project sites will be assured.

Hydrological restoration and creation of small scale depressions by top soil removal are one-off activities. They should support and restore salinization – infiltration of salt water to the surface. It will be further monitored.

The removing of deep drainage channel in SCI Kamenínske slaniská has improved water regime on 45 ha of this project site. Moreover, it has improved the water retention capacity of this site and thus contributed to resilience of the landscape in the nearby region to extreme climatic events (e.g. droughts or local floods resulting from large storms) and hence also resilience to adverse effects of climate change.

Both in 2017 and 2018, relatively large flocks of migratory birds were observed in northern part of SCI Kamenínske slaniská – in numbers, which were not usual in years preceding to restoration of water regime and grazing. These were especially waders (e.g. *Vanellus vanellus, Tringa totanus, Gallinago gallinago, Tringa glareola*) and waterfowl (*Anas crecca, A. querauedula*) – which require periodic waters with low grass turf and absence of trees or bushes. As these conditions were on a large part of the site created by the project actions, the improved conditions for migratory birds can be considered as an important environmental benefit of the project.

The management of project sites had positive influence also on small predatory species of birds, namely on Little Owl (*Athene noctua*), which has been disappearing in many parts of Europe during last decades. Within monitoring of this species in project region, the data

show, that since the project beginning, the number of breeding pairs significantly increased, what might be related to proper management of project sites, as this species hunts small prey in open habitats and the recorded new breeding pairs were located in close surrounding of project sites (Chrenkova and Dobrý unpublished data).

Eradication of invasive species on sand dunes was started and best recently known and efficient methods are being used. After the end of the project, SNC will ensure eradication of *Ailanthus altissima* and *Robinia pseudoacacia* on project sites.

b) **Long-term / qualitative economic benefits** – project contributes to the regional development in the area with relatively high unemployment. Abandoned protected areas were prepared for regular management by grazing or mowing and local farmers/communities were attracted to realise regular management in most of the cases. In a longer term, it has economic impact. We believe that starting of regular management will attract new financial incentives - agri-environment payments.

c) Long-term / qualitative social benefits (e.g. positive effects on employment, health, ethnic integration, equality and other socio-economic impact etc.)

Inspired by the restoration of grazing on the project site SCI Kamenínske slaniská, the people from Kamenín (led by the mayor) created another common pasture on the opposite side of the village, where they raise their own mangalica pigs. The pigs are used for village feasts, which everyone can join. A nice example is a Mangalica Festival, which was for the first time held on 23 May 2015 and then every year. Also, the mayor provided a similar place for unemployed and marginalized Roma families in the village. They use an abandoned ruderal plot next to the village for grazing animals. They cleared illegal waste dumps which were on the site to prepare it for grazing with their own labour and funds (only with a small starting investment from the mayor), they created a fence and brought sheep and mangalica pigs. Now, they are much more independent in producing their own food and also proud of their work, which contributes to more attractive surrounding of the village.

The results from Kamenín already inspired people from nearby communities. Mayors and representatives of several other villages (Chľaba, Kamenica nad Hronom, Bajtava, Obid, Chotín) have expressed interest to create similar common pastures. In Chotín village, this initiative already resulted in creating two common pastures, where inhabitants of the village keep their sheep. One of them is SCI Chotínske piesky (a site of this project). Hence, grazing can become an effective way to raise the attractiveness of the settlement´s surrounding, return to tradition, while increasing the biodiversity of nature. Also, marginalised groups of inhabitants (e.g. Romas, long-term unemployed or people with lower education) can find sustainable and long-term jobs by taking care of the animals. By restoring ecosystem services, this approach can make village communities more self-sufficient. This is especially important in more remote regions.

The project has improved the attractivity of the project sites and thus also the potential of local communities for development of sustainable tourism.

The mayor of Kamenín village has prepared and submitted a mid-scale INTERREG project (Hungary-Slovakia cross border cooperation) to use the potential created by the project on SCI Kamenínske slaniská. As there are usually several people weekly visiting the site, to see the best preserved salt marshes in Slovakia and the odd-looking grey steppe cattle – he has decided to improve the infrastructure for visitors (and also possible long-term benefits for

his village). Within the project he has submitted (and which was approved), a wooden visitor centre next to the site will be created, a lookout tower and also a traditional house in the village, where visitors can explore the traditions of the region. For larger groups of visitors, tours on wooden wagon, pulled by team of horses will be available to explore the natural values of restored SCI Kamenínske slaniská. The visitors will be offered to buy meat produced organically from animals grazed on the site. This can bring further benefits for the village community and its inhabitants.

d) Continuation of the project actions by the beneficiary or by other stakeholders.

Where local stakeholders were supported by project to start with grazing, they signed the contract with longer term commitment to realise management at least for 5 years after the end of project. Special emphasis on sustainability was paid when designing grazing regime on project site - robust grazing systems were chosen, which can bring benefits for local farmers and communities and hence motivate them for continuation of grazing. When creating grazing infrastructure, materials with highest possible durability were used (e.g. wooden poles from black locust – a natural material with durability of 20-30 years were used on most of the project sites, wind water pumps were used to provide effective watering of animals – a solution requiring very low maintenance.

The educational programmes will continue to be provided to schools in project region via the structure of the Slovak Environmental Agency, therefore the set of educational tools was delivered to Ecocentre Dropie and will be used in programmes on salt marshes and sand dunes offered by the ecocentre.

3. **Replicability, demonstration, transferability, cooperation**: The dissemination of the demonstration character of the LIFE Project to local stakeholders was a vital part of the project, to ensure sustainability of the project actions for following years. Managing a NATURA 2000 sites in a sustainable way by supporting of re-introduction of traditional management and implementation of restoration management on project sites was presented to local and national stakeholders on the final project conference. The conference was organized in order to promote project approach as a tool for local biodiversity restoration. Apart from increasing awareness it provided stakeholders, experts and authorities with the necessary tools in order for them to apply conservation measures themselves in the future. The toolkits for teachers introduce a new concept of presentation of Natura 2000 sites to public. Interactive worksheets and games for kids introduce interesting biological concepts to children of different ages. Teachers got materials easy to print and duplicate and can incorporate it easily to education in frame of National Curriculum. This concept is followed by educators and nature conservationists in other regions of Slovakia.

4. **Best Practice lessons**: The whole long-term process of work with local stakeholders leads to sustainable and long-term management of the project sites. Case study based on the model project approach on SCI Kamenínske slaniská was published on the web page devoted to the Natura 2000 (http://www.n2k.sk/casestudy/1) and is focused on general public. There are following conclusions of the case study:

- Long-term protection conservation of protected area is not possible without the interest and direct involvement of local residents.

- A key condition for support of local people is education: to explain the importance of protected areas Natura 2000, understanding the importance of protected habitats, an understanding to manage the Natura 2000 sites.
- Nature protection and management of protected areas doesn't have to be in conflict, but rather, they are mutually supportive and complementary.

The project provides best practice lesson also in educational aspect. The intensive work with teachers in form of elaboration of methodological materials, worksheets available also on CD, educational workshops, field excursion and also examples of educational programmes provided unique guidance for teachers, such that many teachers have directly incorporated activities with Natura 2000 habitats and species into their regular lessons.

5. **Innovation and demonstration value**: restoration of panonic salt marshes by top soil removal has significant level of innovation. It was used in situations, when top soil layer was deteriorated by different farming activities. Survival of salt tolerant plants depends on infiltration of salty water close to surface, but if the soil structure was destroyed, lower capillary pressure cannot transport water. We have tested depth of soil layer with sufficient salinity in each site and based on these measurements we planned extent and depth of restoration measure. The positive effects of top soil removal were evident even few days after restoration with visible soil spots on the surface.

6. **Long term indicators of the project success**

Long term indicators of the project success will be set based on the evaluation of the conservation status of habitats within the Comprehensive Information and Monitoring system (CIMS), managed by SNC. Monitoring data represent the basis for the development of reports on the status of species and habitats of European interest according to Art. 17 of the Habitats Directive (Reporting). This obligation is to be complied with at 6-year intervals.

Independent monitoring of habitats of European significance in the Slovak Republic was realised and assessed for the period of 2013 – 2015 and for targeted habitats can be found in Table xy - http://www.biomonitoring.sk/.

Code	Habitat	FV	U1	U2
1340*	Inland salt meadows	22.2	67.7	10.1
1530*	Pannonic salt steppes and salt marshes	18.2	45.5	36.3
6120*	Xeric sand calcareous grasslands	46.5	41.9	11.6
6260*	Pannonic sand steppes	45.2	48.4	6.4
91N0*	Pannonic inland sand dune thicket (Junipero-Populetum albae)	0	0	100

Targeted conservation status of habitats till year 2025

Code	Habitat	FV	U1	U2
1340*	Inland salt meadows	40	70	0
1530*	Pannonic salt steppes and salt marshes	30	60	10
6120*	Xeric sand calcareous grasslands	50	50	0
6260*	Pannonic sand steppes	50	50	0
91N0*	Pannonic inland sand dune thicket (Junipero-Populetum albae)	20	70	10