



LIFE Project Number
<**LIFENAT2007/H/000324**>

FINAL REPORT

Covering the project activities from 01. 01. 2009 to 31. 12. 2013.

Reporting Date
<**25/04/2014**>

LIFE PROJECT NAME
<**Restoration of sodic lake sub-type of the Pannonic salt steppe and marsh habitat in the Hortobágy**>

Project Data

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| Project location | Hortobágy: Nagy-szik–Magdolna-pusztá–Kerek-fenék |
| Project start date: | <01/01/2009> |
| Project end date: | <30/06/2013> Extension date <31/12/2013> |
| Total Project duration (in months) | <54>months Extension months <6>months |
| Total budget | € 1 557 507 |
| EC contribution: | € 1 168 130 |
| (%) of total costs | 75 |
| (%) of eligible costs | 75 |

Data Beneficiary

| | |
|-------------------------|--|
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LIST OF ABBREVIATIONS

CP=Common Provisions (of LIFE+)

EC=European Commission (Európai Bizottság)

EU=European Union

FNB = Foundation for the Nagy-szik of Balmazújváros („A Balmazújvárosi Nagyszikért” Alapítvány)

HEA=Hortobágy Environmental Association (Hortobágy Természetvédelmi Egyesület)

HNPD=Hortobágy National Park Directorate (Hortobágyi Nemzeti Park Igazgatóság)

MGB = Municipal Government of Balmazújváros

MNV Zrt.= Hungarian State Holding Company (Magyar Nemzeti Vagyonkezelő Zrt)

NEF=Nature Exploring Foundation (Természet Felfedezése Alapítvány)

NFA= National Land Fund Management Organization (Nemzeti Földalapkezelő Szervezet)

TIKÖFE=Environmental Protectorate of the Trans-Tisza Region (Tiszántúli Környezetvédelmi, Természetvédelmi és Vízügyi Felügyelőség)

TIKÖVIZIG=Trans Tisza Region Environmental and Water Directorate (Tiszántúli Környezetvédelmi és Vízügyi Igazgatóság)

TPF=Tiszatáj Public Foundation for Environmental Protection and Nature Conservation (Tiszatáj Közalapítvány)

VAT=Value-Added Tax=ÁFA

1. Executive Summary

The primary objective of the project was to achieve a better conservation status of the project site (habitat 1530) by implementing the foreseen activities. This aim was entirely realised, which is supported by the fact that the water regime of the site has been restored, the direct and indirect pollution of sodic water has been eliminated, the expanse of characteristic plant associations typical of soda pans has increased, and the number of migrating and breeding bird species has increased gradually. These objectives have been achieved by implementing the activities, utilising the tools and realising the deliverables described briefly below.

Action A.1: With the help of a Microsoft Excel table based “overall action plan”, we were able to calculate the actions and costs according to the foreseen plan. This program also facilitated lessen the loss deriving from non-reimbursement of VAT and exchange rate loss and the technical and financial implementation of the project was realised with certain modifications compared to the project proposal.

Action A.2: The technical plan for water management and habitat restoration was completed with a certain degree of delay and modifications. The plan included the recommendations of all competent authorities and, in addition to conservationist interests, was adapted to the requirements and expectations of local inhabitants. Negotiations, complementary studies and subplans necessary for this were causing some delay. The basic objective of the plan remained unchanged, and restoration of the water regime of the soda pan was realised.

Action A.3: From a conservationist perspective, there were two great threats present on the project site at the beginning of the project period, namely a waste dump and a sewage pond. During the project period, we were negotiating successively with subcontractors and entrepreneurs working on the elimination of the sewage pond and waste dump to achieve soda pan like habitats in the sites, which was recorded in two separate feasibility studies. The two studies describe the management and sustainment of the sites following the recultivation, according to a detailed Natura2000 management plan. The waste dump and half of the sewage pond have been eliminated during the project period in accordance with our recommendations. The studies were forwarded to the competent authorities, NGOs and policy makers.

Action B.1: One of the most important project objective was to transfer the entire soda pan bed to the ownership of a nature conservation organisation. To achieve this, the 6.765 ha lakebed in the Nagy-szik was purchased at a reasonable price, following a prolonged negotiation.

Action B.2: A secondary aim was to transfer the direct catchment area of the soda pans into the ownership of a conservationist organisation. We managed to purchase a 9.0445 hectare of the catchment area which was originally foreseen in the project and 21.8799 hectare of the catchment area which was not foreseen in the project. The 21.8799 hectare plot

of land has a far higher nature conservation value than the sites originally planned to be purchased, and embraces an approximately 5 hectare large soda pan (Kerek-fenék) as well. The rest of the sites foreseen to be bought was not purchased since the seller desisted from his intention to sell the site. With the purchase of a soda pan, however, the original objective of the action, which is active protection of soda pans and their catchment area, was overachieved.

Action C.1: The objective of this action, that is, elimination of waste water arriving on the site was fully achieved. A permanent sluice and 4 permanent culverts (one of which is 0.279 km) were installed and 4.246 km new channel was created as well as a 2.7 km long fortified bank and 0,465 km deepened channel. The implementation of the action was somewhat delayed compared to the foreseen deadline, especially due to the delay of the technical plan, which, however did not affect the original project objectives.

Action C.2: The aim of the action is the management of original water regime in soda pans, that is, keeping surface water on the site and raising subsurface water table. To achieve this, in the Nagy-szik 3 sluices and in Magdolna-pusztá 4 ogee-type weirs have been installed. Also, 2.3 kms of drainage channels were eliminated in the Nagy-szik and 4.147 kms in the Magdolna-pusztá. The ecological basis of survival of soda pans is the phenomenon of seiche. That is why a 5.937 km part of the bank of Magdolna-ér in Nagy-szik was removed and 2.967 km of the Magdolna-ér itself was transformed into a natural watercourse. A slight delay of the implementation of the action was the result of delay in the technical plan, but it did not affect the original project objectives.

Action C.3: The primary aim of the action was to restore original conditions in damaged tracts of soda pan bed. To ensure this, borrow pits found in the Nagy-szik were transformed into a natural looking soda pan bed by dredging 24,500 m³ soil, a predominant proportion of which was used for the restoration of the 3.5 km long soda pan shoreline. As a result, by the end of the project period, the Nagy-szik soda pan was embraced by a predominantly natural and partly restored shoreline and the pan bed lack any type of unnatural depressions or protrusions. The implementation of the action was somewhat delayed compared to the foreseen deadline, mostly due to a delay in the technical plan but it did not affect the original project objectives.

Action C.4: The aim of the action was to shift the meadow and marshy features of the project site to the soda pan range with the help of livestock grazing and trampling. A further objective is to ensure an initial succession stage, that is, very short grass conditions with many bare patches devoid of vegetation in the project site by each spring. To achieve this, the HEA and FNB purchased 80 Great Grey Cattle, 34 Mangalica pigs, 2 horses, 183 Racka sheep, 21 donkeys and 400 geese, which were kept for nature conservation purposes, and provided for an ecologically sustainable high level of grazing in the most salt-affected tracts. Among project costs, expenses of livestock keeping complying with EU regulations, such as wintering site, winter fodder, veterinary fees, medication and the necessary consumables were charged. Coordinated by the partner organisation FNB and assisted by various programmes

like presentations, meetings and free-of-charge livestock (Racka sheep) transfer, locals were incentivised to keep livestock. As a result, assisted by animals purchased by the HEA and their young, as well as livestock kept by lessees of the project site and locals involved in grazing ecologically sustainable high level of grazing was ensured in the entire project site, which is the basis of soda pan restoration activities.

Action C.5: The objective of this action was to enhance the impact of deflation, a sustaining mechanism in soda pans. To ensure this all, mainly invasive woody plants found on the project site were cut down. A secondary aim of the action was to restore the soda pan landscape, that is, the treeless, short-grass, bare conditions. Therefore, herbaceous invasive species were also set back. The resulting conditions will be sustained with ecologically high level of grazing.

Action C.6: The objective of the action was to eliminate all kinds of pollution sources on the project site that would otherwise have a detrimental effect on the special soda pan ecosystem. To fulfil this task, the waste dump and all other waste (concrete, soil bricks, etc.) deposited in an unauthorized place were removed.

Action C.7: The aim of the action was to get local inhabitants accustomed to the new situation resulting from the altered conditions by providing them with increased amount of information. To achieve this, within the framework of partnership, the intensity of Ranger Service was increased. As a result of the project actions, there is practically no unauthorized access to the site.

Action D.1: The aim of the action was dissemination of project's results for as many people as possible, especially for local inhabitants. To achieve this, 1,552 m² of domestic real estate was purchased in the close vicinity of the Nagy-szik area, where a 170.4 m² visitors centre was built with traditional architectural elements. In the building, an office to provide for operation and sustainment of the project, a permanent exhibition and a guest room are also included. The Visitors Centre as well as all the furniture and additional complementary elements (dinner set, cutlery set etc.) were designed and realised in traditional style which is the main attraction for tourists in the region. To present the project results, 3 watch towers and 9 information boards were set up. The project results were disseminated among nearly 4,000 visitors arriving individually or in groups at presentations, and other occasions.

Action D.2: The objective of the action was to popularize the project's results by using the resources of ecotourism and, at the same time, ensure the operation of the Visitors Centre from this revenue. To achieve this, an ecotourism service pack including guiding and accommodation services has been compiled, which are primarily marketed through our website and leaflets. There has been intense interest and booking for the year 2014.

Action D.3: The aim of the action was to publicize the project's results for layman as well as professional audience in the form of publications and lectures. Therefore, several publications were compiled and presentations were held in the following grouping: Articles about scientific results of the project, Scientific meetings, presentations and posters, Articles and TV reports about Life+ project, Meetings, presentations and lectures about the project. An especially high number of publications were written on the ecological survey of the soda pans

in the Carpathian Basin. As a result, two soda pan conservation projects were initiated in the area of the Kiskunság National Park, one of which is a LIFE+ project.

Action D.4: The aim of the action was that information on the activities of the project should be available for every inquirer in a fast and easy way through the internet. To realise this, the renewed HEA website offers a new link in the “news” section which provides information on important project milestones. In the gallery hundreds of high-definition photos show the actions of the project and natural assets found on the project site. The number of visitors to the website is high, the most popular search engine renders our website on the first page when searching for terms in connection with soda pans. .

Action D.5: The aim of the action was to embrace all Carpathian Basin data available at present and publish it in a scientific and popular handbook for professionals, conservationists and policy makers in the Carpathian Basin and the EU. A further objective was, to incentivize a wider target audience to manage and restore natural and disturbed soda pans assisted by the information published in the book, 1,000 copies of which have been published in English language, featuring several hundreds of photos and figures. Its content is based on the synthesis of the ecological survey carried out in 2009 and 2010 in the entire area of the Carpathian Basin and the publications published to date.

Action E.1: To ensure a smooth operation of the project and achieve the set objectives, five persons were employed full time until 1st June 2013 and four persons were employed full time between 30th June and 31st December 2013. Our 32 page, bilingual Layman’s report was published in 1,000 copies, most of which was distributed among people living next to the project site in Balmazújváros. The project management was in continued contact with the partners (HNPI, FBN, TPF) to ensure that objectives be achieved. Subcontractors and volunteers and casual workers also took part in the implementation of the action. When picking the tools and commissioned parties, the management carried out the required tendering procedures. Despite unforeseen expenses such as non-reimbursement of VAT and exchange rate losses, 100% of the project has been implemented with smaller modifications compared to the project proposal.

Action E.2: The objective of this action was to ensure a higher nature conservation status of the project site, which is a process best indicated by changes in the avifauna. The analysis of the data gained from over 3,000 hours of survey executed by the company commissioned with the implementation of the action and the project management’s similar amount of data has revealed that the number of both migrating and characteristic breeding waders has increased significantly on the project site.

Action E.3: The aim of the action was to evidence a higher conservation status of the project site with the changes of *vakszik* and *szikfok* areas. Survey data of the commissioned company reveal that the project actions contributed to the increased presence of *vakszik* and *szikfok* associations. Although it could also be stated that it is to some extent influenced by the amount of rainfall throughout successive years. As a result of restored natural water regime, the further, significant increase of *vakszik* and *szikfok* areas is to be expected a in the near future.

Action E.4: The aim of the action was to ensure that the project results be preserved in the long run following the closing of the project. To ensure this, a Life after Life management

plan has been prepared, containing actual recommendations for the special management of the various habitat patches of the project site.

2. Introduction

A general objective of the project was to achieve a higher nature conservation status of the project site through the implementation of actions. A more specific aim was to eliminate threats that negatively affect the former soda pan habitats and direct catchment areas and to restore the original soda pan conditions in the disturbed soda pans. The actions that assisted most in achieving these goals were ecologically sustainable high level of grazing (Action C.4) and soda pan habitat restoration (Action C.1.-C.3). As a result, threats have been eliminated in the project site (Nagy-szik, Kerek-fenek, Magdolna-puszta), and, especially in the Nagy-szik and Kerek-fenek, intensifying of natural soda pan features have been recorded (changes in avifauna, increased presence of *szikfok* and *vakszik* habitat patches, water chemistry data) Soda pans represent a unique subtype within the Pannonian salt steppes and salt marshes habitat type (1530), the total expanse of which In the Carpathian Basin and at the same time in the EU is below 5,000 hectares.

Parallel to the intensifying of soda pan features on the project site, the breeding population of bird species confined to salt habitats, such as *Recurvirostra avorsetta*, *Himantopus himantopus*, *Charadrius dubius*, *Vanellus tringatotanus* and *Limosa limosa* have increased. Also, enhance of population was observed in the case of migrating Annex I and Annex II species. These Annex I species are: *Podiceps grisegena*, *Pelecanus crispus*, *Phalacrocorax pygmaeus*, *Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Ciconia nigra*, *Ciconia ciconia*, *Plegadis falcinellus*, *Platalea leucorodia*, *Anser erythropus*, *Branta ruficollis*, *Aythya nyroca*, *Clangula hyemalis*, *Milvus migrans*, *Pernis apivorus*, *Circaetus gallicus*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Circus cyaneus*, *Circus pygargus*, *Circus macrourus*, *Buteo rufinus*, *Aquila pomarina*, *Aquila heliacal*, *Aquila chrysaetos*, *Pandion haliaetus*, *Falco vespertinus*, *Falco columbarius*, *Falco peregrinus*, *Falco cherrug*, *Porzana porzana*, *Porzana parva*, *Crex crex*, *Grus grus*, *Otis tarda*, *Himantopus himantopus*, *Recurvirostra avosetta*, *Burhinus oediconemus*, *Glareola pratincola*, *Charadrius alexandrinus*, *Pluvialis apricaria*, *Philomachus pugnax*, *Gallinago media*, *Numenius arquata*, *Tringa glareola*, *Hydrocoloeus minutus*, *Larus melanocephalus*, *Sterna hirundo*, *Chlidonias niger* and *Chlidonias hybridus*. These Annex II species are: *Cygnus olor*, *Anser albifrons*, *Anser fabalis*, *Anser anser*, *Tadorna tadorna*, *Anas clypeata*, *Anas querquedula*, *Anas platyrhynchos*, *Anas acuta*, *Anas Penelope*, *Anas strepera*, *Anas crecca*, *Aythya farina*, *Bucephala clangula*, *Mergus albellus*, *Mergus merganser*, *Perdix perdix*, *Rallus aquaticus*, *Coturnix coturnix*, *Phasianus colchicus*, *Gallinula chloropus*, *Fulica atra*, *Pluvialis squatarola*, *Vanellus vanellus*, *Lymnocyptes minimus*, *Gallinago gallinago*, *Numenius phaeopus*, *Tringa erythropus*, *Tringa tetanus*, *Tringa nebularia*, *Larus ridibundus*, *Larus canus*, *Larus michahellis*, *Larus cachinnans* and *Hydroprogne caspia*.

With the help of restoration activities, the two most serious threats were eliminated, namely rainwater drainage and wastewater discharge on the project site. Furthermore, proliferation of invasive species was set back, communal waste and debris deposits were eliminated and unauthorized site access was discontinued as a result of increased presence of ranger service. The primary tool of management was ecologically sustainable high level of grazing. To achieve this, grazing by livestock was revived and complemented with the application of a nature conservation grazing system, since a basic nature conservation management action to enhance biodiversity and soda pan features is high level grazing. Local inhabitants were involved in grazing management, and nearly 300 million HUF was devoted to the project-related services carried out by local and regional agriculturists and entrepreneurs, from whom products and livestock were also purchased. Some real estate selling problematically in the region was also purchased on a reasonable price and utilised for farming and presentation for nature conservation purposes. In the form of VAT and other fees, over 50 million HUF have been paid for the Hungarian state. As a result of water regulation activities and traditional architectural investment, all having considered the interests of locals, demand for houses and plots of land found in the area and real estate prices are expected to increase. A total of 13 families were subsidised and incentivised by getting them involved in grazing management, which also contributed to the favourable judgement of the project.

A long-term result foreseen in the project site is that the number of characteristic breeding bird species confined to salt habitats will peak in 200-300 pairs, and the expanse of soda pan water body will reach 200-300 hectares.

3. Technical part

The project's aims of which the most important ones are the strengthening of the lake's sodic character, the increase in the numbers of the breeding character species and the growth of the barren sodic patches and habitats have been achieved with the following actions.

3.1 Description of the management system

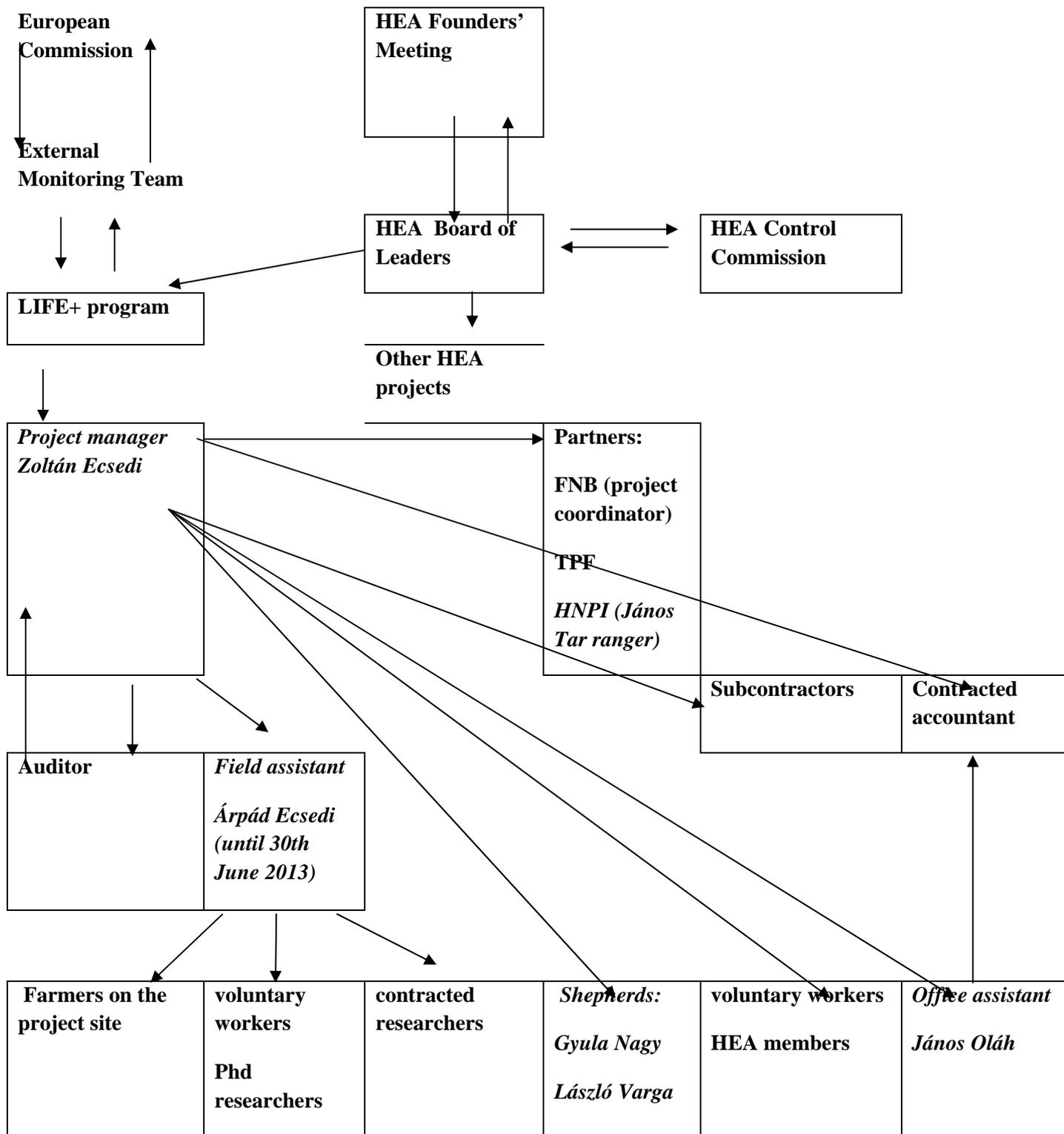
ACTION E.1: Overall project operation

The aim of the action is the successful implementation of the project in time according to details of project and the EC's directions.

What has been done: On the first day of January 2009 the employment contracts were made with the employees accepted on the HEA members' meeting. On 1st January 2009 Zoltán Ecsedi started his 8-hour full-time job as project manager, and on the 7th January 2009 Regina Szegedi also took on her 8-hour full-time job as an office assistant. Their responsibilities were included in their employment contracts. On 3rd April 2009 János Oláh started his 8-hour full-time job as field assistant. On 15th April 2009 Gyula Nagy also started his 8-hour full-time job

then on 5th May 2009 József Kiss took on his 6-hour full-time job, both as shepherds. Our office assistant Regina Szegedi had gone on maternity leave from 1st of January 2010 and was replaced by Dóra Pusztai Szilágyiné. The new office assistant Dóra Pusztai Szilágyiné went on maternity leave from 28th July 2010 so János Oláh moved from the field assistant position to the office assistant position and his place was taken as field assistant by Árpád Ecsedi. Our first shepherd Gyula Nagy is continuous but there were changes with our second shepherd. Our second shepherd József Kis was changed by László Nagy on 1st April 2010 and he was changed by Ernő László Hegedűs on 15 September 2010. Again he was replaced by Sándor János Ecsedi on 3rd November 2010 and finally changed again by László Varga on the 17th August 2011. HEA's project period prolongation until 31st December 2013 was accepted by EC in December 2012 and Zoltán Ecsedi (project manager), János Oláh (office assistant), Gyula Nagy (shepherd 1) and László Varga (shepherd 2) were employed until the end of the project. But Árpád Ecsedi (field assistant) work was carried out by the four employees after 30th June 2013 when he left the project. The changes have no influence on the basic mission and goal of the project or on the contracted job descriptions of the positions.

Figure 1.:Organizational chart of the LIFE+ project in 2013



*The staff set in italics are employed by the project.

Partnership agreements were prepared and signed by all parties: HNPI, 10/06/2009; FNB, 01/06/2009; TPF, 01/04/2009 (*see Inception Report, Annex 7.1*). There was no need to add or change anything in the existing agreements.

One GPS palmtop was purchased in March 2010 (*see Mid Term Report Annex 8.31*) which was successfully used for the several project actions (B1, B2, C1, C2, C3, E1, E2, E3). It was not only used in action E2 as foreseen and this was approved the EC in letter 22/04/2010.

Continuous coordination and meetings were carried out by HEA in the following actions: permitted plan (Action A.2.), sewage work recultivation (Action A.3.), land purchase (Action B.2.), cutting of marshy vegetation (Action C.3.), livestock purchasing and organization of the ecologically high level of grazing (Action C.4.), organizing volunteer works (Action C.3., C.4.), coordination with partners (Action B.2., C.4., C.7.), planning of the visitor centre (Action D.1.), creation of brochure, reports and publications (Action D.2., D.3.), updating website (Action D.4.), coordination of sodic pan surveys (Action D.5.), supplementing, organizing and supervising monitoring work (Action E.2.) and financial planning and execution (all Actions).

The positive changes of the restoration works is being followed and researched by three PhD students, one other student preparing the MsC thesis from this subject, one student entered a secondary school competition with the subject of the restoration work and several students spent their field work on the project site as volunteers.

HEA prepared and delivered the following reports prior to this report:

Inception Report (10/11/2009)

Progress Report (15/08/2010)

Mid Term Report (27/12/2011)

Progress Report II. (25/02/2013)

Layman's Report (31/12/2013) (Annex 1.)

Final Report (20/05/2014)

Reasons for divergence from the project plans: Some actions (see action A.2, C.1-C.3) have been seriously delayed by external reasons while others started earlier (see Action C.4) which gave huge quantities of extra work for the management team.

Evaluation: The intended target of the action has been 100% achieved as all management activities were started in time and according to the plans and all the actions were successfully finished by 31st December 2013 until the closing date of the project.

Notes: HEA in order of effective management especially the due and fast upkeep of the financial tables we purchased a laptop computer. To assess the area and also to have adequate illustration for reports, web sites, lectures etc an annual aerial photo scanning was carried out; the cost of which is under external assistance.

In 2012 and 2013 to meet the demands of the increased workload we employed some personnel on a short term basis; the incurred costs are listed under personnel and highlighted in grey.

For the minutes and documentation of the EC requested meetings please see Annex 2.

3.2Actions

3.2.1 ACTION A.1: Devise overall action plan-master plan

The aim of the action is to see clearly the schedule of actions and the financial problems of the project. With the help of this plan the project becomes safer and well-planned.

What has been done: From the 30th of January 2009 until 1st of December 2013 an overall plan-master plan was prepared and regularly updated. According to the project proposal this table was submitted with the *Inception Report (10/11/2009) in the Annex 7.4*. This plan-master plan table was created, compiled and updated by the project manager and the office assistant in the general working hours. In this plan the recommendations of EC, all employees and the project partners have been continuously considered and realised. The master plan was updated in every three month. The required amount of correspondance with the partners was mainly done by telephone and skype discussions.

Reasons for divergence from the project plans: There has been no divergence from the project plans.

Evaluation: The intended target of the action have been 100% achieved as the overall action plan was useful to forsee the financial difficulties, to determine the priority of actions and help in the timing of the actions and the entire project (eg. it was clearly visible from this plan-master plan that the project needs a half year extension).

3.2.2ACTION A.2: Technical plans for water management and habitat restoration

The aim of the action is the implementation of habitat restoration with well-established professional skills being in possession of all compulsory authorizations.

What has been done: The Environmental Protectorate of the Trans-Tisza Region (TIKÖFE) has finally approved the baseline assessment (not part of the LIFE+ project budget) study on the 2nd February 2010 (for the progress *see Inception Report page 9*). The authority declared its opinion about that no significant environmental effect is supposed during our planned investment. Following this we selected the subcontractor (Vizkincs Bt, Debrecen) for preparing the technical plan for water management and habitat restoration of the project on 23rd March 2010. The contractor has already finished the technical plan in January 2011 (*see Mid Term Report, Annex 8.2*) and we immediately submitted to the Environmental Protectorate of the Trans-Tisza Region (TIKÖFE) for approval. After several personal

consultation and additional statements the final technical plan was approved by TIKÖFE on the 30th January 2012. The finally approved technical plan requested the mandatory installation of two ground-water measuring (monitoring) wells(Annex 3.). A separate technical plan was completed and licensed by Vízkincs Bt. (commissioned by HEA) for these wells and was approved by TIKÖFE on the 7th November 2012.

Reasons for divergence from the project plans: There were two years of delay (24 month) to get the finally approved technical plan but this delay did not jeopardize the project objectives. The delay was through no, fault of our own because the request was started immediately after the technical plan was completed (by Vízkincs Bt, Debrecen). The main reasons of the delay were because of the developed bureaucracy: various requests, many unforeseen reconciliation, additional field surveys and owner's contributing statements especially the one from the Municipal Government of Balmazújváros. For more details (22 points) *see the Mid Term Report page 12-14.*

Evaluation: The intended target of the action has been 100% achieved by the end of January 2012 as the technical plan has been completed and the rehabilitation field works started on the 20th of July, 2012.

Lessons learned: (1) If any restoration works take place to a nearby human settlement (village, town) it is advisable to have the approved technical plan ready before the submission of the project proposal. Getting an approved technical plan can cause several years of delay to the originally planned time schedule. (2) Any restoration project it would be advisable that the coordinating beneficiary would be the owner or the deputy owner of the project area involved in restoration works.

Notes: In the technical plan the authorities requested the construction of two ground water monitoring wells as a pre requisite for the operational plan. HEA Therefore contracted Vízkincs Bt Debrecen to carry out this task, this is listed under external assistance. The construction of the above wells was part of the construction contract.

3.2.3 ACTION A.3: Conduct feasibility study for the elimination of waste dump and restoration of sewage pond

The aim of the action is to conduct a feasibility study for the elimination of these two environmentally harmful activities and offering a plan for decision-maker organizations on field management (Natura 2000).

What has been done: From 23rd May 2010 to 2nd December 2012 the selected company (Belemnites Kft, Gödöllő) has prepared the feasibility studies according to the project proposal. 50-50 copies of each study were received and it was distributed in December 2012 to relevant authorities, policy makers and local specialists. A copy of each study has been sent with our Progress Report in February 2013 (*see Progres Report II., Annex 8.1 and 8.2*). The project manager and the office assistant supervised the preparation of these studies and also distributed it after the completion.

Reasons for divergence from the project plans: There was a 10 month delay in the completion of the study as there was continuous coordination with the companies dealing with

the permitted implementation plan of the recultivation. But the delay did not jeopardize the project objectives as HEA was already able to suggest the MGB in 2010 how to do the recultivation of some parts of the sewage ponds with materials from the uncompleted studies. The HEA was advising on the field works so as the recultivated terrain could resemble a soda lakebed with flat breeding islands for shorebirds (from sodic soil). The recultivation was completed by August 2010 and an image of the partially recultivated sewage pond was submitted in August 2010 (*see Progress Report, Annex 8.6.*). The recultivation of the old (unused) waste dump at the Magdolna-puszta has started in November 2012. Several of HEA's recommendations were integrated into the recultivation project so after the recultivation was finished in August 2013 the terrain resembles a soda lakebed (Annex 4.).

Evaluation: The intended target of the action has been 100% achieved as both feasibility studies were completed and its recommendations were used at the actual recultivation works. Also both studies have recommendations for the after-recultivation plans and according to the MGB and HNPĐ these will be used for the management of the recultivated areas.

Lessons learned: (1) All the threats within a project area has to be dealt with in some ways even if there is no realistic hope of the elimination of the threat (and not even included in the project). (2) A preparation of a feasibility studies for the different threats are very good tools to raise public awareness and if circumstances are fortunate they can be used for the actual management like in the case of HEA's two studies for the waste dump and the sewage pond. (3) The feasibility studies should target the most adequate natural solution of the recultivation for the entire area (or threat) and no compromise should be made.

Analyses of long term benefits and perspective for continuing the action: (1) The usage of the recommendations of the produced feasibility studies has resulted 7.27 hectares of polluted area to recover into habitat No 1530 (of the soda subtype wetland). (2) If the after-recultivation plans suggested by the feasibility studies will be used for the habitat management in the future then the ecological level of these recultivated areas will increase. (3) Although 10 hectares of the sewage ponds remained unrecultivated yet but the produced feasibility study also have recommendations on the recultivation works and after-recultivation habitat management plan for this area as well. (4) This is the first management plan (Natura 2000) for the recultivated sewage ponds and waste dumps established in the Pannonic salt steppes and salt marshes habitat.

3.2.4 ACTION B.1: Purchase of privately owned part of sodic lake bed

The aim of the action is that the total extent of soda lakebed should be owned by environmental organizations to enforce the necessary management without impediments.

What has been done: On the 2nd May 2012 our partner TPF managed to purchase the 6.765 hectare land plot (plot number 026/6) from Gergely Kerekes after several years of correspondence and reconciliation (since 2009). The land purchase contract was done in front of a notary (Number of notarial act: 32022/Ü/739/2012/1.) including all required and possible guarantees for the long-term protection. For the sales contract and the official land register sheet see Annex 5. and Annex 6.

The purchased land plot is part of the Nagy-szik soda lakebed, belongs to the habitat No. 1530 and a Natura 2000 site with national park protection status.

The land plot was purchased for 9,542.59 Euro compared to the foreseen 10,391 Euro of the project proposal.

Reasons for divergence from the project plans: There was a 15 month delay in the land purchase to the original plan but this delay did not jeopardize the project objectives because the ecologically high level of grazing was maintained from the very beginning of the project (discussed and executed by the owner's permission). Moreover the owner of the land plot did not endanger the soda lakebed management and by the time the rehabilitation field works reached this land area (creation of the 'Balmazújvárosi övások' - bypass drainage channel and drainage channel elimination) it was already purchased so the field works were flawless.

Evaluation: The intended target of the action has been 100% achieved as the land plot was purchased.

Analyses of long term benefits and perspective for continuing the action: (1) The long term soda lakebed adaptive habitat management is now without obstructions. (2) Based on the project achievements the HNPD have designated the new land blocks for renting (10 yearlong) to be one single block for the most important sodic parts which is adjacent to the purchased land plots. This new land block has been rented by HEA so the long term adaptive habitat management is now secured. (3) Following the adaptive habitat management and the surface and subsurface water movements with no obstacles, it is now expected that in the future primary and secondary soda pan character species will increase in this land plot. These would include species like *Arctodiaptomus spinosus*, *Puccinellia limosa*, *Sueda prostrata*, *Spergularia sp.*, *Vanellus vanellus*, *Tringa totanus* and *Himantopus himantopus*.

3.2.5 ACTION B.2: Purchase of privately owned part of catchment area of sodic lake in Nagy-szik

The aim of the action is that there should not be in progress any kind of harmful agricultural works on the catchment area of the sodapan. The management of catchment area should be guided by the management of soda pans.

What has been done: In the project period a total of 30.9244 hectare land has been successfully purchased by TPF (Table 1.). They managed to buy 9.0445 hectare of the catchment area which was originally foreseen in the project and 21.8799 hectare of the catchment area which was not foreseen in the project. In the project plans a total of 35.9642 ha land purchase was foreseen and 86% of this quantity was executed. For the 86% of the original land purchase only 43.6 % of the original budget was spent. All the land purchase contracts and land register sheets were submitted with the Mid Term Report (*see Annex 8.6a and 8.6b*). As the conservation clause is not possible to include in the land register (*see the official statement in Mid Term Report Annex 8.4*) a commitment was signed by our associated beneficiary Tiszatáj Public Foundation in front of a notary that all purchased land plots will be used in long term nature conservation. Also an obligation to transfer the land to a legal body active in the field of conservation (supported by the relevant Hungarian law) in case the Tiszatáj Public Foundation ceases to exist (*see the commitments in Mid Term Report Annex 8.5*). This additional sworn was sent again in the *Progress Report II as Annex 8.3*. A total of 38,054 Euro was spent from the foreseen budget of 87,218 Euro. The 49,164 Euro which was

not used for land purchase was used for the additional cost of the field works (Actions C.1-C.3).

Table 1. Areas to be purchased according to the project plan (in normal style) and the realized land purchase plots in the catchment area (in bold). The originally not foreseen purchased land plots in bold and italics. The land plots which were incorporated in the Natura 2000 network during the project period are marked with *.

| Area type | No of plot | Size (ha) | Selling price (advertised by owner) € | Owner |
|---|--|----------------|---|---|
| Farm | 063/9 | 0.0250 | 10,156 | Posta Lajos |
| Forest | 06/60 | 9.6282 | 20,723 | Posta Lajos |
| Forest | 060 | 1.111 | 2,260 | Blaskó Sándor |
| Forest | 060 | 1.111 | 2,335 | Szarvas Imréné |
| <i>Forest</i> | <i>051/1</i> | <i>0.4194</i> | <i>310</i> | <i>Prém János</i> |
| <i>Forest</i> | <i>051/2</i> | <i>0.2397</i> | <i>177</i> | <i>Prém János</i> |
| <i>Forest</i> | <i>0818,8</i> | <i>0.3024</i> | <i>223</i> | <i>Prém János</i> |
| Arable land | 063/9; 063/10; 063/6; 063/11; 063/12 | 11.4331 | 27,691 | Posta Lajos, Posta Lajosné, Nagyné Posta Margit, Posta Zsuzsa |
| Pasture | 063/19, 0,63/5, 063/7, 063/8, | 7.85 | 11,652 | Posta Lajos |
| Pasture, arable land, reed bed | 063/13 * | 6.0279 | 13,560 | Blaskó Sándor |
| Pasture | 063/14 | 0.7946 | 753 | Blaskó Sándor |
| <i>Pasture</i> | <i>042/5 *</i> | <i>19.3186</i> | <i>17,054</i> | <i>Koroknai Zoltán</i> |
| <i>Pasture</i> | <i>042/8 *</i> | <i>1.0097</i> | <i>706</i> | <i>Koroknai Zoltán</i> |
| <i>Pasture</i> | <i>0807/20</i> | <i>0.5901</i> | <i>676</i> | <i>Prém János</i> |
| TOTAL AREA PURCHASED | | 30.9244 | | |

Reasons for divergence from the project plans: All the land plots which was foreseen and not purchased are owned by the Posta-family who stated that they will not sell their land in

the project period contrary to their original statement at the beginning of the project (*see Progress Report Annex 8.1*). However we still had continuous correspondence with the Posta family as well as the Juhász and Berecz families all the way to the end of the project about the possibility of selling their land on the Nagy-szik catchment area but without success. Instead the land plots of the Posta family TPF purchased a large plot of grassland (small sodapan called Kerek-fenek) and other satellite patches in the catchment area (*see Table 1.*) for a favourable price with higher nature conservation value than in the original plans (*see Mid Term Report Table 1. on page 18*). This area was not included in the project application as the owner had no intention to sell it when the project was submitted. The most important reasons of purchasing these plots of land were: (1) the facts that these are extremely important sodic habitats (1530) with several Annex I. species, (2) part of the Nagy-szik ground water catchment area, (3) the plots are part of the project area, (4) the plots are Natura-2000 sites (*see Map 1. in the Mid Term Report Annex 8.3*), (5) and it was a very competitive price (*see Table 1.*).

Evaluation: The intended target of the action has been 86% achieved regarding the land size to be purchased. However the purchased land plots represents a much higher nature conservation value compared to the originally foreseen land plots which indicates a highly successfully executed Action B.2. The 063/13, 042/5 and the 042/8 land plots were successfully incorporated in the Natura 2000 network during the project period.

Lessons learned: (1) If a soda pan purchase is included in any project the following land purchase succession should be used according to the priorities of different habitat types: a) Soda lakebed. b) Arable land or woodland within 100 meter of soda pan. c) Grassland within 100 meter of soda pan. d) Arable land or woodland within 1 km of soda pan. e) Grassland within 1 km of soda pan. (2) All the natural and degraded (disturbed) soda pans in the Carpathian Basin should be purchased and owned by nature conservation oriented entities.

Analyses of long term benefits and perspective for continuing the action: (1) The purchased land plots are rented by HEA and long term habitat management is secured for the special soda pan wildlife and habitat.

Notes:

Regarding the question number 5 of the EU letter 08/03/2012. The specific reference numbers to the land plots of the additional sworn. Please note that somehow this must have escaped the attention of EC as it was sent in the *Mid Term Report as Annex 8.5* and again in the *Progress Report II. as Annex 8.3* again.

Regarding the question number 6 of the EU letter 08/03/2012. For the maps which show the border of the project area, the Natura 2000 site and the purchased lands please see Annex 7.

3.2.6 ACTION C.1: Exclusion of polluted and used waters from the project site

The aim of the action is avoiding the mixing of polluted or used water with the water of soda lakes. Because the lakes can get to an ecologically stable condition only from surface rainfall and below surface water uprush.

What has been done: By the end of June 2012 we had an approved permitted implementation plan by TIKÖFE. The divergence from the original plans (compared to the

project proposal) was discussed and accepted by the EC in the letter dated 08/03/2012. The field works of this action were finally started on the 20th of July in 2012 and finished in December 2013. The field works were executed by Janta-Bau Kft, Debrecen. (commissioned by HEA). In Table 2. and Table 3. there is a summary of the realized works in the Nagy-szik as well as on Map 1. and Map 2. (Annex 8.) the actual location of works is also visible. The numbers on the maps indicates additional images proving the particular work (for the images see Annex 8. too). The captions at the images describe the particular item using the exact names and meters used on the 1/2011 map of the permitted technical plan. Several other images of the field works are available in our website in the ‘news’ section. The filed work action C1/3 (in the proposal) according to our final permitted technical plan is not to be implemented.

Table 2. Field works of action C1/1

| | permanent sluice | permanent culvert | deepened channel | new channel | fortified bank |
|--|------------------|-------------------|------------------|-------------|----------------|
| Permitted technical plan for Nagy-szik | 1 | 3 | 0 | 3,783 km | 2,700 km |
| Realized works in the Nagy-szik | 1 | 3 | 0 | 3,783 km | 2,700 km |

Table 3. Field works of action C1/2

| | permanent sluice | permanent culvert | eliminated channel | new channel | deepened channel |
|--|------------------|------------------------|--------------------|-------------|------------------|
| Permitted technical plan for Nagy-szik | 0 | 1 | 0,279 km | 0,463 km | 0,465 km |
| Realized works in the Nagy-szik | 0 | 1 (279x1m culverts) | 0,279 km | 0,463 km | 0,465 km |

Reasons for divergence from the project plans: The action has suffered a 3 years delay. The reasons for this delay were (1) the two years of delay (24 month) to get the finally approved technical plan (*see Mid Term Report page 12-14.*), (2) the field works were started with the elimination of the Magdolna-ér (C2) to prevent any further delays of the C actions by weather, (3) unexpected archaeological works (Annex 9).

Evaluation: The intended target of the action has been 100% achieved as all the foreseen works in the approved technical plan has been done.

Indicators used to test performance of the actions:

- (1) Quantitative number of secondary soda pan characteristic breeding, foraging and migrating bird species,<
- (2) Extension (square meter) of soda lakebed, ‘vakszik’ and ‘szikfok’ (bare sodic patches),<
- (3) Salinity of the water in the soda pan.<

Analyses of long term benefits and perspective for continuing the action:With the restoration of the natural surface and subsurface water cycles in the project area the ecological

level of the Pannonian salt steppes and salt marshes habitat (subtype: soda water bodies) increased.

There were preparatory coordination in amongst MGB, HNPD and HEA about the ‘Balmazújvárosi övások’ (including the banks, permanent sluices and culverts) that the management will be overtaken in the near future by MGB as the ‘Balmazújvárosi övások’ main purpose is the protection of the town. So the MGB will be able to coordinate the long term management of the ‘Balmazújvárosi övások’ (including the banks, permanent sluices and culverts). Similar preparatory coordination was amongst the Sellő Horgász Egyesület (owner of the Sziki tó) and HEA about ‘Sziki tó külső töltés és övcsatorna’ and the ‘Sziki tó lecsapoló csatorna’ that the management will be overtaken in the near future by the Sellő Horgász Egyesület.

Note: After the starting of the construction works some archaeological findings surfaced, therefore to the continuation of the work the presence of the archaeological authority was requested of which cost is listed under External assistance. This cost is split between action C2 and C3.

3.2.7 ACTION C.2: Restoration and regulation of natural water regime of sodic lakes

The aim of the action is achieving an ecologically stable condition of soda lakes and keeping it.

What has been done: By the end of June 2012 we had an approved permitted implementation plan by TIKÖFE. The divergence from the original plans (compared to the project proposal) was discussed and accepted by the EC in the letter dated 08/03/2012. The field works of this action were finally started on the 20th of July in 2012 and finished in December 2013. The field works were executed by Janta-Bau Kft, Debrecen (commissioned by HEA). In Table 4. there is a summary of the realized works in Nagy-szik and Magdolna as well as on Map 3 the actual location of works (Annex 10.). The numbers on the map indicates additional images proving the particular work (for the images see Annex 10). The captions at the images describe the particular item using the exact names and meters used on the 1/2011 map of the permitted technical plan. Several other images of the field works are available in on our website in the ‘news’ section.

Table 4. Field works of Action C.2

| | Built-in sluice and ogee-type weir | Elimination of embankment | Eliminated channel | Embank fortification with locally excavated material | Obstruction of Magdolna-ér (wide channel) | Channel transformed into natural watercourse (Magdolna-ér) |
|--|------------------------------------|---------------------------|--------------------|--|---|--|
| Permitted technical plan for Nagy-szik | 3* | 5,937km | 2,3 km | 0,850 km | 0 | 2,967 km |
| Realized works until | | | | | | |

| | | | | | | |
|--|----|----------|----------|------------------------|---|----------|
| 31st December 2013 in the Nagy-szik | 3* | 5,937 km | 2,3 km | 0,850 km | 0 | 2,967 km |
| Permitted technical plan for Magdolna-puszta | 4 | 0 | 4,147 km | 0,800 + 1,575+ 0,1 km | 0 | 0 |
| Realized works until 31st December 2013 in the Magdolna-puszta | 4 | 0 | 4,147 km | 0,800 + 1,575 + 0,1 km | 0 | 0 |

Note: Two of the three sluices are located outside the project area but this was already foreseen in the original plan.

Reasons for divergence from the project plans: The action has suffered a 2 years delay. The reasons for this delay were (1) the two years of delay (24 month) to get the finally approved technical plan (see *Mid Term Report page 12-14.*). The ‘kereszt-töltés’ in the Magdolna-puszta was not executed in the field works for the following reasons: (1) the ‘kereszt-töltés’ was designed to protect the edge of the surrounding agricultural land which is government owned and managed by HNPD. According to the new regulation of HNPD all these agricultural lands has to be transformed into grassland so the temporary water cover now would be desired for the area.

Evaluation: The intended target of the action has been 100% achieved as all the foreseen works in the approved technical plan has been done.

Indicators used to test performance of the actions:

- (1) Quantitative number of secondary soda pan characteristic breeding, foraging and migrating bird species <
- (2) Extension (square meter) of soda lakebed, ‘vakszik’ and ‘szikfok’ (bare sodic patches) <
- (3) Salinity of the water in the soda pan <

Analyses of long term benefits and perspective for continuing the action: With the restoration of the natural surface and subsurface water cycles in the project area the ecological level of the Pannonian salt steppes and salt marshes habitat (subtype: soda water bodies) increased.

The surface of the eliminated channels will be managed by grazing and mowing is not required. The grazing of the area is assured by the land block renter as the entire project area belongs to the HNPD and the whole land block renting system is managed and controlled by HNPD. The long-term management of water control sluices will be assured by HEA.

3.2.8 ACTION C.3: Restoration of sodic lakes and their catchment areas

The aim of the action is the restoration of physically damaged soda lakebed and shorelines and the restoration of catchment area in an ancestral, original condition.

What has been done: By the end of June 2012 we had an approved permitted implementation plan by TIKÖFE. The divergence from the original plans (compared to the project proposal) was discussed and accepted by the EC in the letter dated 08/03/2012. The field works of this action were finally started on the 20th of July in 2012 and finished in December 2013. The field works were executed by Janta-Bau Kft, Debrecen. (commissioned by HEA). In Table 5. there is a summary of the realized works in Nagy-szik as well as on Map 4 the actual location of works (Annex 11). The numbers on the map indicates additional images proving the particular work (for the images see Annex 11.). The captions at the images describe the particular item using the exact names and meters used on the 1/2011 map of the permitted technical plan. Several other images of the field works are available in on our website in the 'news' section.

Table 5. Field works of action C3

| | Removed and levelled (m ³ , km) |
|--|--|
| North Nagy-szik Lake | 20,000 m ³ |
| Realized works until 31st December 2013 in the N Nagy-szik Lake | 20,000 m ³ |
| Northwest Nagy-szik Lake | 4,500 m ³ |
| Realized works until 31st December 2012 in the NW Nagy-szik Lake | 4,500 m ³ |
| Nagy-szik Lake shoreline restoration | 3,500 km |
| Realized works until 31st December 2013 of the Nagy-szik shoreline restoration | 3,500 km |

Reasons for divergence from the project plans: The action has suffered a 2 years delay. The reasons for this delay were (1) the two years of delay (24 month) to get the finally approved technical plan (*see Mid Term Report page 12-14.*).

Evaluation: The intended target of the action has been 100% achieved as all the foreseen works in the approved technical plan has been done.

Indicators used to test performance of the actions:

- (1) Quantitative number of secondary soda pan characteristic breeding, foraging and migrating bird species,<
- (2) Extension (square meter) of soda lakebed, ‘vakszik’ and ‘szikfok’ (bare sodic patches),<
- (3) Salinity of the water in the soda pan.<

Analyses of long term benefits and perspective for continuing the action:With the restoration of the natural surface and subsurface water cycles in the project area the ecological level of the Pannonian salt steppes and salt marshes habitat (subtype: soda water bodies) increased. Moreover the soda pan ‘landscape value’ has also been raised with the shoreline restoration. The disused clay pits located in the Nagy-szik soda pan were also transformed into a natural looking bight (cove) of the soda pan.

The ecologically sustainable high level of grazing is especially important in this area of the Nagy-szik soda pan and this is going to be assured by HEA.

Notes:In front of the visitor centre the lakebed’s densest stand of rush (alongside various invasives) was cut before restoration in September 2010, July 2011 and August 2012. Its cost is listed amongst external assistance. This preconditioning was important to facilitate grazing and to speed up the achievement of the sodic nature of the lake. On 29 June 2012 we had a geo referred map made on the pre restoration state; its cost is under External Assistance. This map was of great help to restore the natural state of the former clay pits and to carry out the general work more precisely (Annex 12).

3.2.9. ACTION C.4: Ecologically sustainable high level grazing on sodic lakes and their catchment areas

The aim of the action is the improvement of soda lake’s characteristics of the site. In the beginning this could have been ensured with a transition of a grazing lake.

What has been done: The intended target of the action has been 100% fulfilled as the ecologically sustainable high level of grazing foreseen in the project proposal has already been achieved by November 2011 (this means 1,2 livestock unit in the soda pan area; *see aerial image in Mid Term Report Annex 8.7*) by the following actions:

- 1) *Livestock purchase (summarized in Table 6.)*

All the livestock funded by the project (see Table 6.) are continuously kept exclusively in the project area. All the ID numbers livestock purchased by the project are included in Annex 13. In the Annex 14. few examples of the ‘durable good registration sheet’ (tárgyi eszköz) can be seen which shows that all type of livestock breeds belongs to Durable Goods according to the Hungarian Law. According to this rule we moved all Racka sheep and goose costs from ‘Other direct cost’ to ‘Equipment’ in our final financial table.

Table 6. Number of livestock purchased by the program in 2009–2013

| Livestock breeds | Owner | 2009-2013 | Planned | Natural Livestock increase (young) |
|-----------------------|-------|-----------|---------|------------------------------------|
| Hungarian Grey Cattle | HEA | 80 | 100 | 58 |
| Mangalica pig | HEA | 34 | 60 | 5 |
| Horse | HEA | 2 | 10 | 0 |
| Racka sheep | FNB | 110 | 100 | 13 |
| Racka sheep | HEA | 173 | 200 | 240 |
| Donkey | HEA | 23 | 10 | 5 |
| Goose | HEA | 400 | 800 | 0 |

2) *Stewardship - involve local farmers to keep some of the project animals*

In the spring 2010 FNB commissioned an expert to prepare a study which includes both theoretical and practical items how to encourage local people for animal keeping (see *Progress Report Annex 9.1*). Based on this study we also have involved local farmers to keep some of the project animals (see Table 7.). Mr Zoltán Koroknai keeps woolly pigs on the Kerek-fenek and the contract allows him to keep the increase. The racka sheep donation scheme has also been launched in 2011 by the associated beneficiary FNB. A total of 110 racka sheep was purchased under the project (to exclude SAP) and leased to local people. The contracts also allow the farmers to keep the increase but the sheep must be grazed at the project site. Four of these farmers were also interviewed and this was published in the ‘*The Voices of LIFE – 20 years of getting things done*’ publication (page 66-68).

Table 7. Livestock leased by the project to local farmers

| Livestock breeds | Owner | Leased to | number | Located in summer | Located in winter |
|------------------|-------|-----------------|--------|-------------------|----------------------------------|
| Mangalica pig | HEA | Zoltán Koroknai | 24 | Kerek-fenek | Koroknai Farm |
| Racka sheep | FNB | Ludnai István | 10 | Nagy-szik | Széchenyi u. 107., Balmazújváros |
| Racka sheep | FNB | Király János | 10 | Nagy-szik | Széchenyi u. 79., Balmazújváros |
| Racka sheep | FNB | Harangi László | 10 | Nagy-szik | Róna sor 2., Balmazújváros |
| Racka sheep | FNB | Katona Zoltán | 10 | Nagy-szik | Róna sor 3., Balmazújváros |

| | | | | | |
|-------------|-----|--------------------|----|-----------|-------------------------------------|
| Racka sheep | FNB | Gyügyei László | 10 | Nagy-szik | Széchenyi u. 49., Balmazújváros |
| Racka sheep | FNB | Szanka István | 10 | Nagy-szik | Széchenyi u. 55., Balmazújváros |
| Racka sheep | FNB | Oláh Ferenc | 10 | Nagy-szik | Kölcsey F. u. 43., Balmazújváros |
| Racka sheep | FNB | Bodnár József | 10 | Nagy-szik | Rákóczi u. 49., Balmazújváros |
| Racka sheep | FNB | Gém Imre | 5 | Nagy-szik | Esze T. u. 22., Balmazújváros |
| Racka sheep | FNB | Nemes László | 5 | Nagy-szik | Keleti u. 11., Balmazújváros |
| Racka sheep | FNB | Szlávik János | 5 | Nagy-szik | Kossuth u. 99., Balmazújváros |
| Racka sheep | FNB | Szilágyi Sándor | 5 | Nagy-szik | Széchenyi u. 53., Balmazújváros |
| Racka sheep | FNB | HEA | 10 | Nagy-szik | Nagy-szik tanya |

3) *Purchase the technical items obligatory for livestock keeping*

In April 2009 we purchased the farmhouse in the Nagy-szik (022/4) as foreseen and this farm is the centre of livestock keeping throughout the project period (*see the Inception Report Annex 7.14*). The farm plot number 022/4 contract and the land register sheet were sent in *Progress Report II. Annex 8.8*. Please note the contract for the plot number 022/4 is the actual invoice and the nature conservation commitment in front of the notary is attached in Annex 15 (answer for the question Nr. 10 from Commission letter of 23.04.2013). This farm house (*see photo in Inception Report Annex 7.14*) has been refurbished, which also included renovation of winter shelters for the Donkeys and Hungarian Grey Cattles (see Annex 16.).

Mobile (1700 m) and temporary (10 ha has been enclosed) electric fences have been purchased as foreseen (*see Inception report Annex 7.16 and Mid Term Report Annex 8.33*). A horse-drawn cart has been purchased on the 08/02/2010 (*see Progress Report Annex 9.0*). In 2013 an unforeseen bicycle was purchased for one of the shepherds to be able to execute his growing task with the project livestock (the field assistant left the project on the 30th of June).



Photo 1: Temporary electric fence and mangalica pigs in action

4) Ensuring EU standard livestock keeping

Two herdsmen were full time employed from Balmazújváros to look after the project animals from the beginning of the project period (see more details in ‘description of project management’ section of the Final report). Also all registration fees, veterinary services, winter fodder and small value consumable material related to the Action C.4 were serving the livestock keeping. The winter keeping of the increased number of livestock required a rental of tractor (external assistance) as the horse drawn cart was simply not enough to execute the daily work with animals.

5) Coordinating non-project livestock to the project area

Besides the livestock purchased in the frame of project we persuaded other local farmers to keep their livestock in the project site in order to achieve the ecologically sustainable high level of grazing. For example a new herd of Hungarian Grey Cattle (150 individual) was brought to the NW part of Magdolna-puszta because of this coordination work of HEA. This particular area was not utilized for grazing in the past 20 years at all. HEA was also advising to HNPD about the elaboration of the new borders of land blocks being rented to the local farmers. The sole target was to be able to maximize and maintain the number of grazing animals in the project area in long term.

Reasons for divergence from the project plans: We employed both herdsmen from the beginning of the project as the livestock purchase took place earlier than foreseen (the main reason for starting the Action C.4 earlier was the delay of the Action C.1-C.3). Because of this earlier start more winter fodder was required for the project period. Mainly this longer livestock keeping period caused the 30,000 Euro increase of the consumable materials. Also the price of winter fodder was higher than usual in 2 years out of the 5 project years (because

of the exceptionally wet conditions in 2010 and because of the exceptionally dry weather in 2012).

Starting the Action C.4 earlier resulted, more natural livestock increase (offspring's of purchased livestock) than foreseen (see Table 6.). The desired ecologically sustainable high level of grazing targeted by the project was reached by November 2011. As a result of these slightly less livestock was purchased in the timeframe of the project. The saved budget which was not used for the livestock purchase was used for the additional cost of winter fodder and for the field works (Action C.1-C.3).

The HEA's practical experience shows that donkeys can be used for grazing in wet and extreme conditions far better than horses. We had a favourable offer of purchasing more donkeys than foreseen in the project and still keep within the budget so we decided to increase the number of donkeys up to 21 or more and we will not purchase 10 horses, as we planned it at the beginning.

FNB purchased 10 more racka sheep as foreseen because the contracted farmers only undertake the agreement if they have fertile female racka sheep. This cannot be guaranteed and FNB decided to purchase ten more at the original purchasing time then replacing them (if needed) later with more expensive separate purchase.

Evaluation: The intended target of the action has been 100% achieved as the ecologically sustainable high level of grazing foreseen in the project proposal has already been achieved by November 2011. The desirable high level of grazing was kept throughout 2012 and 2013 as well.

Results of the community grazing scheme: The involved framers contributed the following to achieve and maintain of the adequate level of grazing and thus to conserve the sodic lake habitat on the mid-long term. (1) Re-application at the land lease tenders. (2) Continuous growth of their stocks. (3) Besides the existing stock they adopted new species (e.g. beef cattle and racka sheep). (4) Expanded their activities to other parts of the Hortobágy. (5) They understood and accepted the importance of temporary water bodies and their role in the maintenance of grazing lands; they do not want to drain them anymore, and adopt their grazing to the circumstances. (6) They would be keen to join a communal grazing system that could facilitate a most effective adaptive land use of sodic lakes and other Hortobágy habitats. The details of this are included in FNB's partner final report in Hungarian (Annex 17).

Best practice and demonstration value of the soda pan gazing: There had been very few attempts to rehabilitate disturbed sodic lakes prior to our project. There had been successful attempts with buffalo grazing. Our results prove that these disturbed habitats may be improved into natural sodic lakes with the restoration of natural water regimes. This requires a pre conditioning of marsh vegetation (preferably with mangalica pigs) followed by a high level of grazing of the lakebed itself and its immediate catchment with mixed breed stocks (grey cattle, racka sheep and donkey). Local farmers are suited for the management of the catchment areas whereas the lakebed is more of the task of the conservation authorities/bodies. The achievements and our recommendations are detailed in our handbook (see action D.5.)

Indicators used to test performance of the actions: The extension of *halophyta* plant associations, the extension of bare sodic patches and the increased number of the characteristic breeding and migrating bird species indicate the positive change in the ecological factors of formerly destroyed soda pan. The water chemistry characteristics also reached the soda lake level. The project area has reached a much higher nature conservation value compared to the degraded state at the beginning of the project.

Lessons learned:(1)These grazing results also gave a fundamental answer to the future management of soda lakes such as the dying (disturbed) soda pans can be changed back to near natural state by using them as a 'grazing lake'. A soda lake has to be self-sustaining even without grazing if it is a healthy ecosystem so the 'grazing lake' is a necessary transition stage towards a natural soda lake. (2) The mowing of salt marshy vegetation in the habitat pre-management is better substituted by grazing 'wooly pigs'. (3) The most suitable livestock to be used for soda pan lakebed and its catchment area management is Hungarian Grey Cattle, Hungarian Flecked Cattle, Donkey and Racka Sheep. They should be kept together in the same habitat or less preferably uses one type of livestock after another but definitely in the same year.

Analyses of long term benefits and perspective for continuing the action:HEA is renting 137 hectare of the project area from HNPD and will keep the 1,2 livestock unit in the area with help of SAPS funds in long term. The grazing will be executed with the livestock purchased by the LIFE project and its offspring's.

On the rest of the project areathe grazing is assured by the various land block renters as the entire project area belongs to the HNPD who is responsible for the control of management. The ecologically sustainable high level of grazing is incorporated in the block rental agreement for all beneficiaries.

Notes:

Regarding the co-financing of the Racka sheep fodder all the SAP scheme payment data is submitted in Annex 18.as requested (in the letter of 22/06/2011).

Table 8. SAPS of racka sheep

| Years | SAPS | Annex | Payment number for Racka | LIFE+ racka stock/ pro rata SAPS payment |
|----------|---------|----------|--------------------------|--|
| 2009 | 228,800 | Annex 9. | 143 | 107/171,200 |
| 2010 | 275,990 | Annex 9. | 143 | 129/248,970 |
| 2011 | 275,990 | Annex 9. | 143 | 165/275,990 |
| 2012 | 0 | Annex 9. | 143 | 150/0 |
| 2013 | 0 | Annex 9. | 143 | 135/0 |
| Összesen | 780,780 | | | 696,160 |

The SAPS is for 143 ewes per annum. SAPS support for the LIFE+ purchased ewe was 2 559 Euros during the project term. Winter fodder for the Rackas was 11 159 Euros, SAPS is only 23% of this amount.

Dead animals were handled by the Hajdúsági Hulladékgazdálkodási Kft, who transported the bodies to the adequate stations; the cost of this is under external assistance.

To meet animal welfare and other legal requirements we had to purchase some smaller value equipment e.g. water pump, cattle trough high pressure washer, fork lift; these costs are under equipment.



Photo 2: Pump for animal keeping inthe Nagy-szik tanya



Photo 3: High pressure washer in the Nagyszik tanya(cumpolsory equipment)



Photo 4: Cattle trough in the Nagyszik Tanya



Photo 5: Forklift for winter fodder transportation in the Nagy-szik tanya

The winter feeding of the animals could not be carried out entirely with the horse cart therefore we rented a tractor for the winter months (cost under External Assistance) whereas the fuel is under other costs.

Out of the 21 head donkey stock 2 we received as a gift – therefore there are no entries for these.

3.2.10 ACTION C.5: Elimination of invasive plant species from the catchments

The aim of the action is the restoration of landscape value of the soda lake.

What has been done: From 2009 June to 2013 December we have eliminated all the trees and bushes from the project site which are not in official forestry cultivation. The exact number of the removed invasive plants can be seen in Table 9. The activity of the action can be seen on several images (see *Inception Report Annex 7.24; Mid Term Report Annex 8.14* and Annex 19.). The removal of *Solidago canadensis* and the *Hordeum jubatum ssp. intermedium* from the Nagy-szik was done by hand-work, grazing and mowing (Annex 20.). Significant part of the removed wood was transferred to the Farm and the Visitor centre to utilize it as winter fuel.

Table 9. Removed invasive plants from the project site (2009-2013)

| Sites within the project area | Total quantity at the beginning of the project (estimated) | Removed in 2009 | Removed in 2010 | Removed in 2011 | Removed in 2012 | Removed In 2013 | TOTAL removed until the end of the project |
|---|--|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| Magdolna-pusztá | | | | | | | |
| <i>Elaeagnus angustifolia</i> | 212 ind. | 12 ind. | - | 30 ind. | 70 ind. | 120 ind. | 232 ind. |
| <i>Rosa canina</i> | 129 ind. | - | - | 30 ind. | 85 ind. | 90 ind. | 205 ind. |
| <i>Rhus typhina</i> | 70 ind. | - | - | 20 ind. | 30 ind. | 35 ind. | 85 ind. |
| <i>Other trees and bushes</i> | 54 ind. | - | - | 20 ind. | 10 ind. | 40 ind. | 70 ind. |
| Nagy-szik | | | | | | | |
| <i>Elaeagnus angustifolia</i> | 614 ind. | 457 ind. | 50 ind. | 75 ind. | 32 ind. | 20 ind. | 634 ind. |
| <i>Rosa canina</i> | 97 ind. | 24 ind. | 6 ind. | 30 ind. | 37 ind. | 30 ind. | 127 ind. |
| <i>Rhus typhina</i> | 5 ind. | 5 ind. | - | - | - | - | 5 ind. |
| <i>Solidago canadensis</i> | 3,3 hectares | 2 hectares | 1,3 hectares | - | - | - | 3,3 he |
| <i>Hordeum jubatum ssp. intermedium</i> | 7,22 hectares | 3 hectares | 4,2 hectares | - | - | 1 hectares | 8,2 he |
| <i>Other trees and bushes</i> | 225 ind. | 34 ind. | 26 ind. | 65 ind. | 100 ind. | 25 ind. | 250 ind. |

Reasons for divergence from the project plans: There were more invasive trees and plants removed from the project site as it was foreseen in the project proposal.

Evaluation: The intended target of the action has been 100% achieved as all the bushes and trees disappeared from the soda lakebed and the catchment area so the landscape opened up.

Lessons learned: (1) all trees and bushes has to be removed from a soda lakebed and its catchment area as the woody growth evaporate two to four times more water than the soda pan's natural plant associations and the leaves of trees and bushes also load more organic material to the system.

Analyses of long term benefits and perspective for continuing the action: Eliminating all invasive plants from the project site greatly increase the 'landscape value' and also with less evaporation the relatively high ground water level will be kept which is vital for all soda pans. The shoots of trees and bushes can be suppressed by the ecologically high level of grazing. In case any of the invasive plants would regenerate the block renters will assure the

removal of them. This is incorporated in the block rental agreement for all beneficiaries with HNPDP.

Notes: To tackle the invasive plants more effectively we purchased a brush cutter and a chainsaw (costs under equipment). These were used by the HEA employees.



Photo 6: Chainsaw



Photo 7: Brushcutter

3.2.11 ACTION C.6: Elimination of illegal waste dumps, transportation of communal waste off the site

The aim of the action is reaching and keeping an ecologically stable condition of soda lakes with the exclusion of any kind of pollution.

What has been done: From 2009 June to 2013 December we have eliminated all the waste dumps, plastic garbage and other materials from the project site. The exact quantity of the removed waste can be seen in Table 10. All the 'other material' (concrete, soil, bricks etc) was removed by the company commissioned for the field works (Annex 21.). The 'communal waste' was collected by volunteers and HEA employees. In 2013 we held two special events for volunteers from Debrecen University (in September and November) for collecting communal waste from the project area as well as to introduce the LIFE+ project (see HEA's Facebook page and Annex 21.).

Table 10. Removed waste from the project site (2009-2013)

| Sites within the project area | Total quantity at the beginning of the project (estimated) | Removed in 2009 | Removed in 2010 | Removed in 2011 | Removed in 2012 | Removed In 2013 | TOTAL removed until the end of the project |
|---|--|------------------|-------------------|-------------------|---------------------|-------------------|--|
| Magdolna-puszta | | | | | | | |
| <i>Plastic garbage</i> | 12 m³ | 6 m ³ | 2 m ³ | 2 m ³ | 2 m ³ | 1 m ³ | 13 m³ |
| <i>Other material (concrete, soil, bricks etc.)</i> | 22 m³ | | | | | 25 m ³ | 25 m³ |
| | | | | | | | |
| Nagy-szik | | | | | | | |
| <i>Plastic garbage</i> | 14m³ | | 10 m ³ | 4 m ³ | | 11 m ³ | 25 m³ |
| <i>Other waste material (concrete, soil, bricks etc.)</i> | 1740m³ | | | 40 m ³ | 1700 m ³ | | 1740 m³ |

Reasons for divergence from the project plans: There was no divergence from the project plan.

Evaluation: The intended target of the action has been 100% achieved as all the waste disappeared from the soda lakebed and the catchment area so the landscape opened up.

Complementary action outside LIFE:(1) Recultivation of the Balmazújváros communal waste dump. This was one of the biggest threats for the project site and has been successfully eliminated. The realization of the project was in 2012/2013 with a total budget of 1,935,000,988 HUF (see Annex 22.).

Analyses of long term benefits and perspective for continuing the action:The collected waste does not pollute the project area any longer. Eliminating all communal and other wastefrom the project site has greatly increased the 'landscape value' of the soda pan. HEA is planning to keep special communal waste collecting events yearly for the public.

3.2.12 ACTION C.7: Increased presence of ranger services on the project site

The aim of the action is the protection of sodic lakes' unique wildlife to a greater extent and eliminating disturbance.

What has been done: From January 2009 to June 2013 the presence of ranger services was increased. The breakdown of the 54 month enhanced ranger service is detailed in Table 11. One telescope and one binocular was purchased in March 2010 (*see Mid Term Report Annex 8.34*). In the final financial table they were included with full cost as in the financial remarks 10 of EC letter 12/01/2010 it was stated in case of the foreseen project targets are achieved the eligibility of extra cost will be considered. HEA believes all targets of the projects were achieved and all actions were 100% completed.

Table 11. Presence of ranger services

| | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------------------|------|------|------|------|------|
| Ranger control by car (km) | 7500 | 7133 | 5437 | 4681 | 2925 |
| Ranger control on foot (km) | 109 | 249 | 204 | 125 | 62 |
| Action/Timber theft (occasion) | 19 | 6 | 0 | 1 | 0 |
| Action/illegal fishing (occasion) | 87 | 3 | 4 | 1 | 0 |
| Action/livestock (occasion) | 18 | 34 | 30 | 28 | 13 |
| Action/safeguarding (occasion) | 23 | 22 | 46 | 27 | 15 |
| Action/monitoring (hour) | 45 | 45 | 51 | 39 | 29 |
| Action/nature education (hour) | 0 | 0 | 2 | 9 | 5 |

Reasons for divergence from the project plans: There was no divergence from the project plan.

Evaluation: The intended target of the action has been 100% achieved as the human disturbance was entirely eliminated from the project site (mainly illegal fishing, dog walking, motor-biking and various other disturbing activities).

A measurable result of the action – independently from the precipitation - is the increase of the number of species intolerant to disturbance e.g. geese and crane (see Annex 31. page 11). A more detailed account is under Action E.2.

Analyses of long term benefits and perspective for continuing the action: In the future the HNPD will continue with the presence of ranger service on the entire project area which will maintain the undisturbance of the area.

3.2.13 ACTION D.1: Development of visitor facilities on the project site

The aim of the action is the dissemination of project's results for as many people as possible, especially for local inhabitants.

What has been done: In January 2009 HEA purchased 1052 square meter land plot where the Visitor Centre was built. For the construction site plot number 188/24 purchase contract, payment proof and the land register sheet *see Progress Report II. Annex 8.9.* and the nature conservation commitment in front of the notary is attached in Annex 15. Please note the payment proof was asked again in EC letter 23/04/2013 which was already sent in the *Progress Report II. (Annex 8.9.)*. The payment for the 1052 square meter was by cash and not by bank transfer and this is the only official payment proof (answer for the question Nr. 10 from Commission letter of 23.04.2013).

Additional land plots were also purchased (500+650 square meter) and being used for the Visitor Centre facilities although it has been declared as provisionally ineligible by EC. It was stated in the letter 12/01/2010 that in case of a successful project 500 additional square meters can be eligible. HEA believes that the project overall is highly successful so 500 additional square meters were left in the final financial table for this action. An architect was commissioned in late January 2009 and contracted in early February for the architectural visualisation of the Visitor centre and its surroundings (*see Inception Report Annex 7.25.*). On the 17th July 2010 the MGB has made a decision and the building permit has been released for the Visitor Centre (*see Progress Report Annex 9.2.*). Finally the 170,4 square meter visitor centre was completed in November 2011 we officially opened it for the public in May 2012 on the combined event of the 20th anniversary of LIFE. The Visitor Centre as well as all the furniture and additional complementary elements (dinner set, cutlery set etc.) were designed and executed in traditional style which is the main attraction for tourists in the region. The exhibition within the visitor centre about the Nagy-szik soda pan and the LIFE+ project was also opened on the same occasion in May 2012. There is available detailed news on our website.

A temporary entrance bridge was installed while the building of the Visitor Centre took place. This was finally changed to a designed permanent bridge which was financed from a different project (see below at Evaluation). A traditional wicker fence was built around the Visitor Centre (Annex 23. and Annex 29.).

Also in 2012 the nature trail around the visitor centre was linked with the nature trail system of an eight hectare neighbouring area where four information boards were installed. Each of these information boards about the 'bíbic' nature trail system (supported by another EU project) also mentions the current HEA LIFE+ project on it (see Annex 23.).

In 2010 our first observation tower was installed at the Kerek-fenék sodapan (*see Progress Report Annex 9.3.*). Another observation tower was installed in 2013 at Sziki-tó and can be accessed from the car parking area of the Sziki-tó Fishpond (see Annex 24.). For more information on the observation towers see 'Reasons for divergence of the project plans'.

Both erected towers have an information panels about the LIFE+ project. Three separate information panels were created and installed at Nagy-szik and at the visitor centre car park (*see Mid Term. Report Annex 8.19a and 8.19b and Progress Report II. and Annex 25.*).

The detailed leaflet (2000 pcs) about the eco-tourism services has been published both in Hungarian and in English, and distributed on all internet forums of HEA (website and facebook) and in the Hortobágy region. We have targeted the various hotels in Debrecen, Hajdúszoboszló and Hortobágy. Also the HNPD Visitor Centre was a main distributor and

was propagated on HEA's and other local events. The paper version is attached as deliverable item (Annex 26.).

Three bicycles were purchased as foreseen in May 2009 (*see Inception Report Annex 7.27*). These bicycles used for access the project site and also to reduce the greenhouse emission.

Two telescopes and two binoculars were purchased in February 2010 (*see Mid Term Report Annex 8.30*). In the final financial table they were included with full cost as in the financial remarks 10 of EC letter 12/01/2010 it was stated in case of the foreseen project targets are achieved the eligibility of extra cost will be considered. HEA believes all targets of the projects were achieved and all actions were 100% completed.

The communication activities related to the action were carried out like this: **(1)Reception and briefing of local people.** Several hundred students from various schools levels (primary, secondary, college, university), organized and private local visitors, families has accessed the Visitor Centre where lectures and talks were given free of charge. In addition the local people were informed about the continual dissemination of results on various local meetings and events and in the local media (press and TV). See in details in Action D.3 and Table 12. **(2)Local networking.** The most important results were the launching of two new Soda Pan Restoration projects in the Kiskunság National Park where HEA has been communicating and advising before the submission of the projects. Besides the contracted entrepreneur HEA employees were also visiting all the natural Soda Pans of the Carpathian Basin at least once where they were communicating and consulting with local nature conservation stakeholders, farmers, experts and decision-makers. All this work is incorporated in the handbook of Action D.5. HEA has also taken part of other national nature conservation meetings for example the in Túrkeve (Gyakorlati Természetvédelmi beavatkozások tapasztalatai változó hazai környezetben, 2012. 11.16-18) (Annex 27.).**(3)International networking.**The previously mentioned consultations about soda pans were also carried out in Serbia and Austria. HEA presented the LIFE+ project with particular emphasis on the soda pan survey at the first Pannonian Bird Experience in Austria. This event for birdwatchers took place near Illmitz - which is also one of the strongholds of soda pans in the Carpathian Basin - from 23 to 25 April in 2010. With the help of volunteers and a poster we potentially informed 3000 people about the aims and achievements of the project (*see Progress Report, Annex 9.9.*). The attending people were from Austria, Hungary, Slovakia, Czech Republic, Germany, Switzerland and the United Kingdom. In October 2013 employees and various local farmers connected to a LIFE+ project (LIFE10NAT/SK/000083) in Slovakia visited the project site and HEA has informed them about the project results(Annex 28.). Visiting birdwatchers from all over the World were also informed continuously about the LIFE+ project from 2009 to 2013.

Table 12. Number of visitors to events held in the project area until 31st December 2013

| Years Events | 2009 | 2010 | 2011 | 2012 | 2013 | TOTAL |
|-------------------------------|------------|------------|------------|-------------|-------------|------------------------------|
| Soda pan professional meeting | 23 | - | - | - | - | 23 (see photos below) |
| Birdwatching tourists | 90 | 120 | 90 | 220 | 250 | 770 |
| Koroknai Farm Events | - | 300 | 250 | 320 | 300 | 1170 |
| Layman visitors | - | - | 120 | 550 | 1000 | 1670 |
| TOTAL | 113 | 420 | 340 | 1090 | 1550 | 3633 |



Photo 8a,b: Soda pan professional meeting

Reasons for divergence from the project plans: The construction of the Visitor Centre had a 14 month delay. The reason for the delay was the unexpected archaeological excavation at the building site and the very wet weather conditions of 2010.

The second observation tower was ready by the foreseen deadline but the installation was delayed because of the delayed field works. Because of the landscape value protection and to focus the visitors to the Visitor Centre which has a large enough land area to host big number of visitors - HEA decided to build one 25 person-capacity observation tower in the frame of an EU Leader project. This was completed in 2013 and will redeem three foreseen smaller observation towers of the LIFE+ project (Annex 29.).

In a MGB coordinated project a new cycle road has been completed which is crossing and touching the visitor facilities of the project area. Hence this new cycle road project HEA only

completed the connecting road (unsurfaced dirt road for bicycles) between Nagy-szik and Magdolna which is the same as the 'vályoggödör határoló töltés' (see Action C.2).

All the delays of the action have not affected the project aims. In fact the visitor centre was foreseen to yield its most important effect primarily after the closing date of the project (long-term sustainability).

There was significant overspending in the action because of the following reasons: (1) the larger size of the Visitor Centre, (2) the usage of the traditional and craftsman materials. This divergence was accepted by EC in letter 12/01/2010.

Evaluation: The intended target of the action has been 100% achieved.

Complementary action outside LIFE:(1) The 25 person-capacity observation tower in the frame of a EU Leader project. (2) Rehabilitation of the 'Új-világ' cemetery (see: <http://www.balmaztv.hu/2011-11-25/5>). On the plot adjacent to the HEA visitor centre (188/25) the old abandoned cemetery is being transformed to a bird friendly memorial park with more native trees by FNB. This park is involved in the presentation trail system of the project with the connection of 'bíbic' nature trail system. Also the permanent bridge was supported by this project. Realization of the project: 2011. Budget: 158 534 Euro. Supported by: EU and the Hungarian Government. Source of funding: Európai Mezőgazdasági Grancia Alap, Új-Magyarország Vidékfejlesztési program.

Analyses of long term benefits and perspective for continuing the action:The most important long term benefit of the action is the distribution of the 'know-like-protect (head-heart-mind) system' in amongst the wider community.

The success of the action can be measured by the number of visitors so the future aim of HEA is to get as many visitors to the Visitor Centre as possible.

The visitors will support the long term maintenance of the Visitor Centre and the other visitor facilities (towers, trails and exhibition) by donation and by using the various facilities.

Note: The full functionality of the visitor centre necessitated the purchase of a fridge and a microwave oven, these are under Equipment.





Photo 9a,b: Fridge and microwave oven

3.2.14. ACTION D.2: Development and running of eco-tourism services

The aim of the action is the introduction of the project in wide-range and also the long-term self-supporting operation of eco-centre from the income of services.

What has been done: The intended target of the action has been 100% achieved as all eco-tourism facilities and programmes (guided tours and accommodation rental) were elaborated and the advertising started and going on as well. In the leaflet discussed in action D1 (printed in 2000 pcs) the guiding services were already advertised (see Action D.1).

All the eco-tourism facilities have been uploaded to the HEA website where online booking is also possible: http://www.hortobagyte.hu/lifeplus_oko_turisztikai_szolgaltatas.php.

For additional advertising we have created a Facebook page for HEA, started our newsletter with the first issue of 'Sziki Hírek' (Annex 30.) and included HEA's eco-tourist services as a tourist attraction in the MGB published booklet (Annex 31.).

Reasons for divergence from the project plans: The accommodation rental was only launched as recently as the 14th of October 2013 (Annex 32.) but HEA already has several bookings for the room in spring 2014.

We had many local people interested in the short guided tours but they were all guided free of charge with the partly project purchased binoculars and telescopes (see Table 11. at Action D.1 and Photo 1.).



Photo 9. Children are watching birds at the Visitor Centre with LIFE telescopes.

Analyses of long term benefits and perspective for continuing the action: The most important long term benefit of the action is the distribution of the ‘know-like-protect (head-heart-mind) system’ in amongst the wider community.

The success of the action can be measured by the number of visitors so the future aim of HEA is to get as many visitors to the Visitor Centre as possible.

The visitors will support the long term maintenance of the Visitor Centre and the other visitor facilities (towers, trails and exhibition) by donation and by using the various facilities.

5.1.1.5 ACTION D.3: Writing and printing of articles, publications and layman’s report

The aim of the action is disseminating the results of the project for the public in written form.

What has been done: The intended target of the action has been 100% achieved as the results and achievements of the project as well as the actions were thoroughly introduced to the professionals and the public too with the help of, articles, talks, posters, meetings, TV reports, personal consultations and the layman’s report.

We have purchased two camera lenses and a camera and these are used for capturing images about the project to help the presentation and documentation (*see Mid Term Report Annex 8.29*).

Articles about scientific results of the project

The following papers (1. and 2.) were published in the scientific journal of Acta Biologica Debrecina Oecologica Hungarica with the permission of the HEA about the soda pan surveys. PhD Mr. Boros Emil is the subcontractor of the Action D.5. and Ms Horváth is a PhD student of his.

- 1) *Boros Emil - Vörös Lajos: A magyarországi szikes tavak sótartalma és ionösszetétele. Salinity and ionic composition of the Hungarian sodic ponds, Acta Biologica Debrecina Oecologica Hungarica Fasc. 22, 2010. (see Midterm report, Annex 8.20)*

- 2) Horváth Zsófia - Boros Emil: *A magyar asztatikus szikes tavak nyár eleji kistrákegyütteseinek (Copepoda, Cladocera) faunisztikai felmérése és mennyiségi vizsgálata. Faunistical survey and quantitativ investigation on the early summer microcrustacean (Copepoda, Cladocera) assemblages of the Hungarian astatic sodic ponds, Acta Biologica Debrecina Oecologica Hungarica Fasc. 22, 2010. (see Mid Term Report, Annex 8.21)*
- 3) Oláh J. 2010 *Ökoszisztéma szolgáltatások a vidékgazdaságban. Valóság 53(5):87-93. (see Mid Term Report, Annex 8.23)*
- 4) Oláh J. 2011 *Gazdálkodás az áradó vízzel. Valóság 54(1):12-20. (see Mid Term Report, Annex 8.24)*
- 5) Szénási I. 2012 *A balmazújvárosi Nagy-szik élőhely-rehabilitációjának hatásai 2009-2011 között. Debreceni Egyetem, Thesis (Annex 33.)*
- 6) Valkó, O., et al., *Environmental factors driving seed bank diversity in alkali grasslands. Agric. Ecosyst. Environ. (2013), <http://dx.doi.org/10.1016/j.agee.2013.06.012> (Annex34)*
- 7) Horváth, Zs., et al., *The keystone role of anostracans and copepods in Europeansoda pans during the spring migration of waterbirds. Freshwater Biology (2013) 58, 430–440 (Annex 35.)*
- 8) E. Boros, Zs. Horváth, G. Wolfram and L. Vörös: *Salinity and ionic composition of the shallow astatic soda pans in the Carpathian. Ann. Limnol. - Int. J. Lim. 50(2014) 59–69. EDP Sciences, 2014 (Annex 36.)*
- 9) Ecsedi Zoltán, Aradi Csaba, Oláh János, Boros Emil : *Vándorló vizek, Élet és Tudomány/Scientific paper, 2014/12 (Annex 37.)*

Scientific meetings, talks and posters

- 1) Horváth, Zs.: *Summer microcrustacean assemblages (Cladocera, Copepoda) related to environmental variables in the astatic sodic pans of the Carpathian Basin (Hungary, Austria and Serbia). Fresh Blood for Fresh Water – Young Aquatic Science, Wassercluster Lunz, Lunz am See, Austria, 2-4th Jul 2010 (see Mid Term Report, Annex 9.6)*
- 2) Horváth, Zs.: *Summer zooplankton assemblages (Cladocera, Copepoda) in the astatic sodic pans of the Seewinkel (Austria). Poster, Student Conference on Conservation Science (SCCS), University of Cambridge, UK, 23-25th Mar 2010 (see Mid Term Report, Annex 9.7).*
- 3) Horváth, Zs & Boros, E.: *Species composition, dominance and diversity of the summer zooplankton (Cladocera, Copepoda) in the astatic sodic pans of Hungary. Poster, 4th*

EPCN (European Pond Conservation Network) Conference, Berlin (Erkner), Germany, 1-4th Jun 2010 (see Mid Term Report, Annex. 9.8).

- 4) September 2009: National Birdwatching Competition. Hortobágy; attendance: about 70 people (*see Mid Term Report, Annex 10.0*). Participants of mostly ornithological background (state and amateur sector) received an hour long lecture on sodic lake ecology and related avifaunal questions. Many participants were from areas with natural and disturbed sodic lakes.
- 5) March 2010: Debrecen branch of the Hungarian Ornithological Society's (MME). Debrecen; attendance about 50 people (*see Mid Term Report, Annex 10.1*). Participants of mostly ornithological background (state and amateur sector) received an hour long lecture on sodic lake ecology and related avifaunal questions. Many participants were from areas with natural and disturbed sodic lakes.

July 2010: Assembly of the Hungarian Hydrobiology Society. Hortobágy; attendance about 45 people (*see Mid Term Report, Annex 10.3*). Emil Boros PhD (contractor) lectured for the academic circles on the latest scientific results of sodic lake research that is the very basis of their conservation. The result of the lecture: information of scientific circles, demonstration of research and the importance of sodic lakes.



6) **Photo 10:** Lecture kept by Emil Boros

In 2011 the results of the sodic pan survey was presented in front of hydrobiology specialist on the annual meeting of the Sodic Lake Working Group of the Hungarian Hydrological Society held at Pusztaszer (Kiskunság National Park) on the 17-18th June 2011. 60

participants from HEA members and national park officers. Results: the findings of the latest ecological research were transferred to researchers and policy makers. (see http://www.hortobagyte.hu/lifeplus_hirek.php?page=2).

1) The results of the Life+ project Sodic Pan survey were included in the following talks:

- *Boros Emil: Szikes tavak ökológiai állapota és természetvédelmi helyzete (see Mid Term Report, Annex 8.25).*

- *Ecsedi Zoltán: A Kerek-fenék rehabilitációja (see Mid Term Report, Annex 8.26).*

- *Horváth Zsófia, Vörös Lajos és Boros Emil: Tócsarások (Crustacea: Anostraca) elterjedése és trofikus szerepe a kárpát-medencei asztatikus szikes tavakban (see Mid Term Report, Annex 8.27).*

- *Horváth Zsófia, Vad Csaba Ferenc, Vörös Lajos, Boros Emil: Nyár eleji kistrákegyüttesek (Copepoda, Cladocera) faunisztikai és mennyiségi vizsgálata a Kárpát-medence asztatikus szikes tavaiban (see Mid Term Report, Annex 8.28).*

2) XII. Természetvédelmi szeminárium, Gyakorlati természetvédelmi beavatkozások tapasztalatai változó hazai környezetben, Túrkeve, 2012. November 16-18. (Annex 27.)

70 participants from NGOs and government background got an insight into the sodic lake management practices based on the findings of the latest ecological research. Results: widespread know how transfer.

3) Conciliation meeting with local water management bodies, June 2011, Balmazújváros Mayor's Office (12 participants - Project Manager, TIVIZIG, Municipal Water Supply, City Management, the Mayor's Office of Investment Department). 2 hour consultation, results: in the Nagy-szik and Magdolna it would be possible to fill up the beds with 0.5 metres. The originally planned track of the belt canal is not possible as it threatens the urban effluent treatment plant and therefore a new track was to be identified e.g. parallel to the Balmazújváros-Hajdúszoboszló countryroad.





Photo 11a, b, c: Participants of the meeting

Articles, booklet and TV reports about LIFE+ project

- 1) Balmazújvárosi Nagy-szik élőhelyrehabilitáció, Ökoturisztikai látogatóközpont, kiadvány (Annex 38.)
- 2) An article has been published about the progress of the project in 2009 in the January issue of the local paper 'Balmazújváros' (see *Mid Term Report*, Annex 9.5).
- 3) *Boros Emil: Szikes vizek különleges kémiai tulajdonságai és jelentősége. Szikes vizek a világban. A Természet Világa 2011/II. különszáma. p.45-47. (see Mid Term Report, Annex 8.22)*
- 1) We have continued to inform the citizens of Balmazújváros about the progress of the report with a TV report this time: <http://www.balmaztv.hu/2011-11-11/2>.

- 2) Távcsőben csodás a vízi világ, Napló/newspaper, 2012 május 21., 6. hét vége (Annex 39.)
- 3) LIFE's graziers of the Hungarian grasslands, The Voices of LIFE 20 years of getting things done, 2012 (Annex 40.)
- 4) Official opening event of the visitor centre in May (on the 20th anniversary of LIFE; <http://www.balmaztv.hu/2012-05-25/3>)
- 5) In September there was a report in the local TV with project manager about the LIFE+ project and the start of the field works (<http://www.balmaztv.hu/2012-09-14/3>).
- 6) Újjáéledő madárvilág a Nagy-sziken, Napló/newspaper, 2013 szeptember 7., Aktuális 3 (Annex 41.)
- 7) A LIFE+ project céljainak és eredményeinek bemutatása: www.balmaztv.hu/2013-09-27/5 (Annex 42.)
- 8) Madárcsalogató változások – Tájgyógyítás a Nagy-sziken, TermészetBúvár, 2014/2. (Annex 43.)

Meetings, talks and lectures about the project

- 1) April 2010: Civil Meeting in Balmazújváros. Balmazújváros; attendance about 50 people (*see Progress Report, Annex 10.2*). Results: information was transferred to the active local population on the project's results, their wider applicability and the possibilities for participation.
- 2) The HEA presented the LIFE+ project with particular emphasis on the sodic pan survey at the first Pannonian Bird Experience in Austria. This event for birdwatchers took place near Illmitz between 23-25 April 2010 which is also one of the strongholds of soda pans in the Carpathian Basin. With the help of volunteers and a poster we potentially informed 3000 people about the aims and achievements of the project (*see Mid Term Report, Annex 9.9., www.hortobagyte.hu/LIFE+/news*). The attending people were from Austria, Hungary, Slovakia, Czech Republic, Germany, Switzerland and the United Kingdom.

Reasons for divergence from the project plans: There was no significant divergence from the project plan. Compared to our original undertaking on the number of publications in the grant application we published more. The ornithological results have not been yet published, as we need 1-2 years after the restoration to produce scientifically valid data. Instead we wrote up a paper on the ecology of the sodic lakes (published in *Élet és Tudomány* - Annex 37) In the local newspaper we published on a regular basis on the project that also went on the

local TV. Two illustrated articles were also published (*Mid Term Report, Annex 8.22 and Annex 43.*)

Evaluation: The intended target of the action has been 100% achieved.

Analyses of long term benefits and perspective for continuing the action: Based on the scientific articles the professionals were thoroughly informed about the importance of the unique ecological system of the soda pans in the Carpathian Basin. Moreover these widely published articles put the soda pans into the spotlight of wetland conservation in the region. The final summarizing international forum of the scientific results will be the book on the Ecology and Management of Soda Pans in the Carpathian Basin (Action D.5).

Based on all the meetings, talks, articles and TV reports the local people were thoroughly informed about the project and its most important targets to restore and save their own soda lake near Balmazújváros. According to our experience people in the city got to know this special habitat on the edge of town and they become proud of their natural heritage and with knowing and loving their environments they will hopefully help in the long term conservation of this unique habitat.

HEA will continue to produce scientific articles about the habitat management and the changes in the bird communities as well as keep informing the public about the long term results of the project too.

3.2.16 ACTION D.4: Setting up website

The aim of the action is that information about the activities of the project should be available for every inquirer in a fast and easy way through the internet.

What has been done: From January to April 2009 the LIFENAT07/H/000324 section of the HEA website was prepared and launched. By June 2009 it was fully operational with all necessary information. From this moment the updating of the website about this project is continuous. Every notable event is summarized in the 'News' section of the LIFE+ part of the homepage. We are also continuously uploading images to the various galleries so visitors can see the wildlife of the soda pans and the project area. Annually at the beginning of the year we update the 'Achieved results' section of the website with details of all the actions of the previous year.

In 2011 we also have launched the eco-tourist section with various programmes on offer and it was followed by the accommodation booking possibilities.

Reasons for divergence from the project plans: After a thorough discussion HEA decided for various professional reasons that (image quality expected to be low from public; continuous administration is involved in long term; neither the project nor the visitors getting extra informations from pictures made by public etc.) will not launch the interactive part of the picture upload on the website. Instead we have decided to use professional images in the foreseen categories on the site so it is more interesting and enjoyable to browse through. Our galleries about the project site and soda lakes have over 200 professional images available for visitors now.

The substantial delay in the C actions caused the delay of launching the electronic 'Sziki Hírlevél' (HEA's newsletter about soda lakes started in 2013; Annex 30.) which is the main

source of networking and to inform other organizations, project managers, researchers of soda lakes, professionals. We have also started a FaceBook page for HEA so this 'Sziki Hírlevél' newsletter is also available for the public.

Evaluation: The intended target of the action has been 100% achieved as the results and achievements of the project as well as the actions are available on the internet.

We tested the Google search results (on 13th December 2013) for 'sodic pan', 'sodic lake', 'szikes tavak' and 'Life+ Hortobágy' as well. The results are very good as our website came up on the 1st place of the first page for the 'sodic pan' search while the 'sodic lake' was the 3rd place on the first page. The Hungarian name of sodic lakes is the 'szikes tavak' and the search result was the 10th on the first page. The 'Life+ Hortobágy' was on the 1st place of the first page. These search results also confirm the easy accessibility of our project's website and all our project results.

Analyses of long term benefits and perspective for continuing the action: All the results of this project can be accessed worldwide for everybody through the internet. HEA will keep uploading results after the end of the project as well.

3.2.17 ACTION D.5: The publication of a book on the sodic lakes of the Carpathian Basin and the possibilities on their restoration

The aim of the action is to publish a book on the results of the research about the ecological and environmental status of the unique soda pans found in the Carpathian Basin. Based on the collected data the book will also include conservation management and a strategy for rehabilitation and restoration of each soda pan.

What has been done: The commissioned subcontractor (PhD Boros Emil: director of Naturglobe Kft, Budapest) has visited all the living soda pans of the Carpathian Basin more than one time each. Data has been collected at various water levels of all the pans such as in drying conditions in 2009 and in very wet conditions with plenty of water in 2010. All the collected and processed data was handled to the HEA and the data-collecting part of the action was closed financially as well.

In 2012 and 2013 the Handbook manuscript was written and was given to HEA and this part of the project with the subcontractor was closed financially as well.

In 2013 the editorial work of the book was started by the project manager and office assistant which meant continuous correspondence with the publisher and arranging the translation. The book titled '*Ecology and Management of Soda Pans in the Carpathian Basin*' was finally printed in late December. According to the agreement with the publisher the 1000 copies of the book is being kept in storage at the publisher until the final invoice has been paid (on April 2014).

Reasons for divergence from the project plans: The only minor divergence was that we had no time to participate in an international conference with the results of this action. This was primarily because of the surplus work and delay of Action C.1-C.3 and the unforeseen huge extra work on the editing of the Handbook. However we did participate on the Pannonian Birding Experience in 2010 where the interim results of the action were shown to potentially 3000 people from all over Europe (see *Progress Report, Annex 9.9.*).

The Hungarian to English translation of the manuscript of the book was not included in the project budget because of the extra cost of Action C.1-C.3.

Evaluation: The intended target of the action has been 100% achieved as the '*Ecology and Management of Soda Pans in the Carpathian Basin*' book was published. The results of the research was also used in the execution of action C1, C2, C3 and C4 of the project.

This is the first time in Hungary that a research - covering one special habitat type in the entire Carpathian Basin - and all the results of it is published in a Handbook within one project-period. This book also contains for every natural soda pans the base of a potential restoration project. It is also the essential base for a potential integral LIFE+ project about saving this special habitat in Europe (Annex 44.).

Analyses of long term benefits and perspective for continuing the action: With the book we communicated with and reached everyone (in the Carpathian basin and Europe) the ecological fundamentals of sodic lake restoration. The knowledge amassed in the publication is derived from this project and the research work of the last decade. It became evident that conservation on its own is not able to save the 77 natural sodic lakes of the Carpathian basin. It is an urgent task to introduce grazing habitat management and to carry out the necessary restoration work. With the help of the book it is easy to draw up a rehabilitation project for any or even all the lakes (e.g. Integrated LIFE+). It will be necessary to revise the book in 10-15 years.

To help field work we had a project booklet printed with a graphic expert (Balogh József), its cost is under External assistance.

3.2.18 ACTION E.2: Monitoring of avifauna

The aim of the action is the justification of two main project targets: increasing the nature conservation value of the project site and strengthening the characteristics of soda lakes, with the help of effective changes in birdlife.

What has been done: during the project we carried out the following ornithological monitoring work:

- 1) The monitoring work is being carried out as foreseen on the whole project area. The commissioned subcontractor (NEF) delivered all the raw monitoring results from 2009, 2010, 2011, 2012 and 2013.
- 2) NEF carries out a weekly monitoring for the migrating birds which includes 8 hours of field works in every occasion so the annual time spent for the migrating bird monitoring is 2080 hours. They spend an additional 5 days each year for the breeding water birds monitoring in springs, which is 200 hours of field work. All data from regular weekly monitoring has been supplemented by observations of the employees, the warden and volunteers. Data has been processed and evaluated by the project management (Annex 45.).

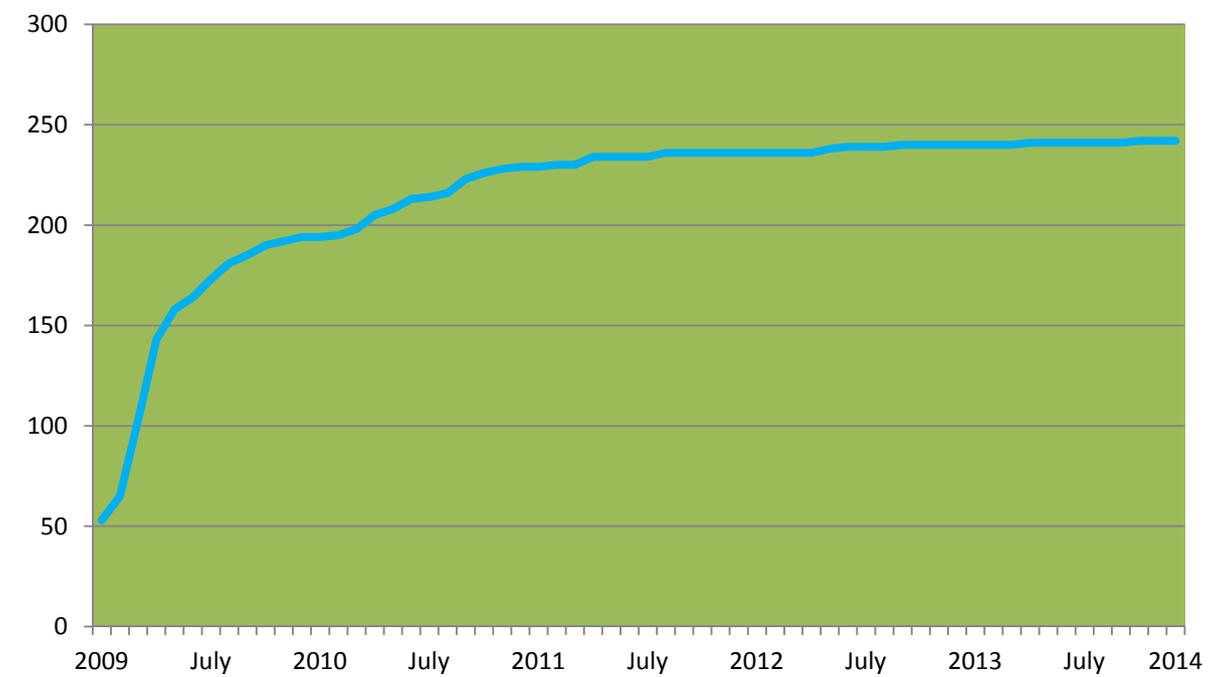
- 3) Two telescopes and two binoculars were purchased in February 2010 (*see Mid Term Report Annex 8.30*).

Reasons for divergence from the project plans:All activities were started in time and according to the plans. The intended target of the action has been 100% achieved as the monitoring data of birds have been collected by a selected NGO (NEF) and properly transferred to HEA.

Evaluation:The change of avifauna clearly supported that the project site reached a higher ecological state and the sodic lake nature became more dominant during the project. A few details are listed below, the full result are3 in Annex 45.

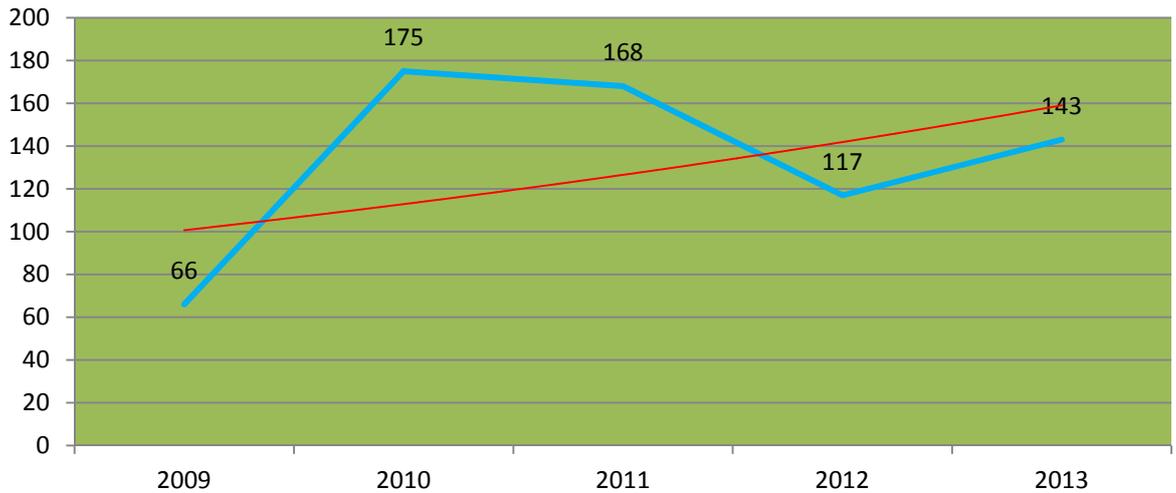
- 1) During the project period altogether 242 bird species were observed at the project site, which is over 90% of the total birds ever recorded at the project site.

Figure 2.Number of recorded bird species in the project area between 2009 and 2013



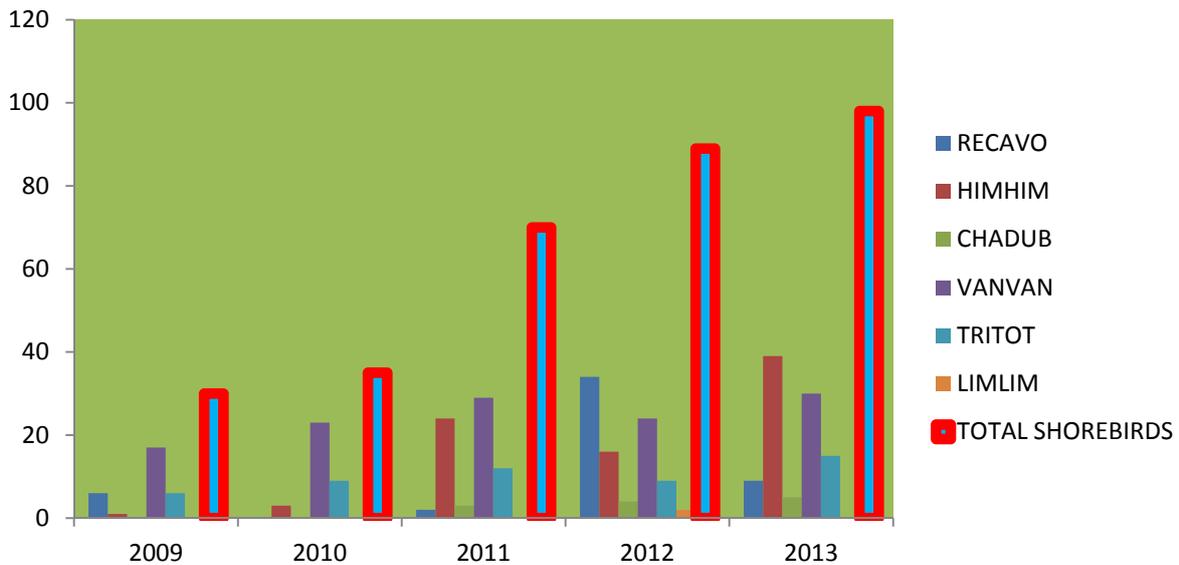
- 2) As a result of the project activities breeding waterbird numbers show a clear increase, though annual fluctuations are affected by annual rainfall.

Figure 3.Number of breeding waterbirds in the project area between 2009 and 2013



- 3) The sodic lake characteristic improved significantly that can be seen very well by the increase of the ground nesting shorebird population as the numbers increased every year independently from the annual rainfall.

Figure 4.Number of breeding shorebirds in the project area between 2009 and 2013



- 4) Change of migratory shorebird population also support the achievement of the project's goals, however these numbers are heavily influenced by the rainfall.

Figure 5.Number of migrating birds in the project area between 2009 and 2013



5) Besides the improvement of the ecological status disturbance also ceased that can be measured by the increase of the number of geese species and cranes. The presence of ranger service was stepped up; uncontrolled access fell to insignificant levels that led to the increase of the above number of the above species.

Figure 6.Number of migrating *Anser sp* and *Grus grus* between 2009 and 2013



Analyses of long term benefits and perspective for continuing the action: The processed ornithological monitoring data provides evidence that the ground breeding shorebird species indicate best the ecological status and the improved sodic lake characteristic. HEA is to undertake a long term shorebird population monitoring. We are to continue – parallel to the national waterbird survey - a monthly migratory bird monitoring to gather additional information. We recommend that to support the effectiveness of any sodic wetland rehabilitation a breeding shorebird monitoring has to be carried out.

3.2.19 ACTION E.3: Monitoring of plant associations

The aim of the action is the verification of the restoration's effect on soda lakes' characteristics with the changes of sodic patches' plant association coverage.

What has been done: The intended target of the action has been 100% achieved as the monitoring data of plant associations have been collected by a selected NGO and properly transferred to HEA from 2009, 2010, 2011, 2012, 2013. NEF carries out the monitoring work in spring (6 days) and autumn (6 days) which includes 8 hours of field works in every occasion so the annual time spent for the plant association monitoring is 96 hours. The total working hours for the 5 years accumulated to 480 hours. The HEA management staff processed raw data, evaluated it. (Annex 46.) To carry out this task HEA purchased a notebook computer as foreseen (*see Midterm report Annex 8.31*).

Reasons for divergence from the project plans: All activities were started in time and according to the plans. The intended target of the action has been 100% achieved as the monitoring data of plant associations have been collected by a selected NGO (NEF) and properly transferred to HEA.

Evaluation: The surface cover of the sodic lake type character plant species increased during the project, that was heavily influenced by both rainfall and the extent of surface waters, to a much greater extent than in the case of the birds.

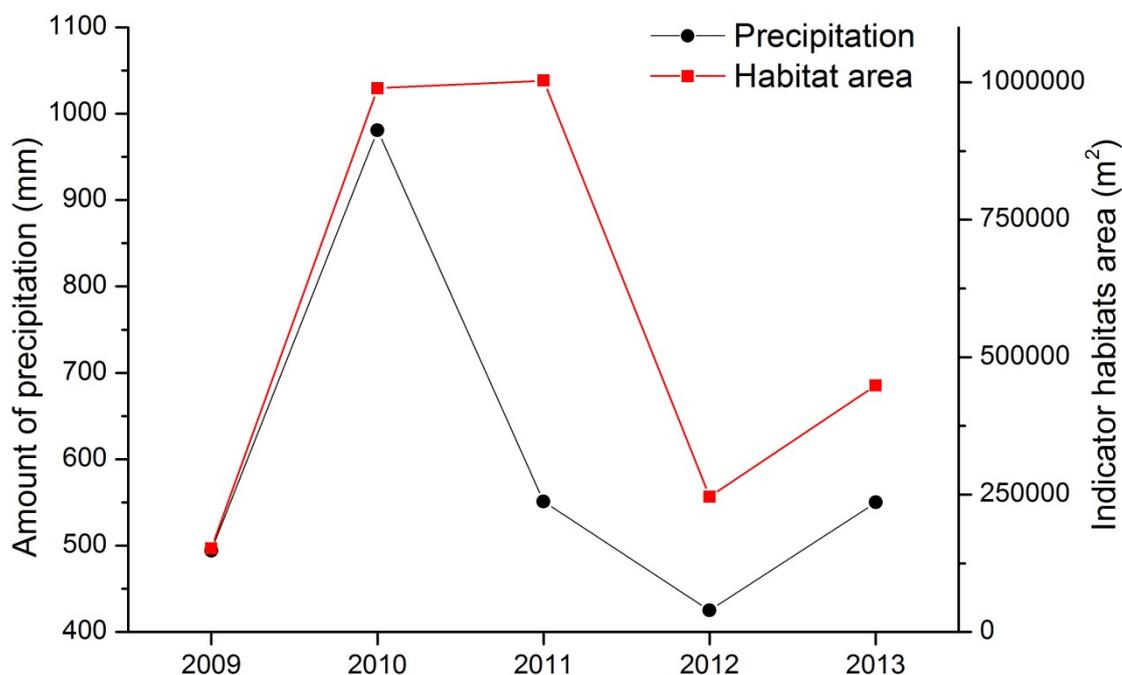


Figure 7. The change of size of the indicator habitat type during the project

The most significant results and correlation of botanical data are as follows:

- Prior to the 2013 rehabilitation the status of the habitats changed significantly during the years with extreme precipitation.
- The extent of vakszik (barren sodic patches) followed closely the amount of rainfall and groundwater levels. Following wet years its extent increased but in dryer years it became overgrown with grasses.
- During the monitored five years the extent of open grassland habitats (especially *Puccinellia-szikfok*) and the *Crypsido aculeatae-Suaedetum maritimae* type.
- Even more significant that the opening up of grasslands and increased rainfall and sodification favoured many rare species like *Suaeda prostrate*, *Spergularia maritime*, *Spergularia rubra*, *Heliotropium supinum* and *Verbena supine*.
- Based on the above any rehabilitation that keeps the ground ware levels higher will have a positive effect on the sustenance of the sodic character.
- It must be taken into account that though considered a character association we did not include *Pucinellietum limosae* in the set of indicators. This association is quick to change and able to shift tens of metres from one year to the next. In years when other indicator associations shrank they usually turned into *Pucinellietum limosae* association.

Table 13. Extent of typical sodic plant association during the project

| Hungarian name | Scientific name | cover 2009 (m ²) | cover 2010 (m ²) | cover 2011 (m ²) | cover 2012 (m ²) | cover 2013 (m ²) |
|---------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Csupasz tómeder fenék | <i>Blind szik</i> | 0 | 842285 | 852 378 | 132 929 | 333100 |
| Sziksófűtársulás | <i>Salicornietum prostratae</i> | 0 | 0 | 0 | 0 | 0 |
| Szolonyec vakszikknövényzet | <i>Camphorosmetum annuae</i> | 0 | 0 | 0 | 0 | 0 |
| Bajuszpázsitos-sziki sóbollás | <i>Crypsido aculeatae- Suaedetum maritimae</i> | 0 | 9 628 | 44 613 | 4 494 | 35 929 |
| Magyar sóballás | <i>Suaedetum pannonicae</i> | 22 615 | 0 | 0 | 0 | 0 |
| Bajuszpázsitgyep | <i>Crypsidetum aculeatae</i> | 127 738 | 134 617 | 101 559 | 104 349 | 72 914 |
| Dárdás-labodás szoloncsák társulás | <i>Atriplicetum prostratae</i> | 0 | 0 | 0 | 0 | 0 |
| Karcsú bajuszfűves | <i>Heleochloetum alopecuroidis</i> | 0 | 0 | 0 | 0 | 0 |
| Vastag bajuszfűves | <i>Heleochloetum schoenoides</i> | 0 | 0 | 0 | 0 | 0 |
| Faluszéli libatopos | <i>Chenopodietum urbici</i> | 0 | 0 | 0 | 0 | 0 |
| Látonyás iszapfű- társulások | <i>Elatini-Lindernenion</i> | 0 | 0 | 0 | 0 | 0 |
| Henye vassfűves | <i>Heliotropio- Verbenetum supinae</i> | 1 542 | 2 530 | 4 560 | 4 320 | 6 510 |
| total | | 151 877 | 989 060 | 1 003 110 | 246 092 | 448 453 |

Analyses of long term benefits and perspective for continuing the action: Botanical monitoring data support the favourable change of sodic characters, however precipitation may alter significantly the key associations' ratio. Therefore we plan to do follow up monitoring of the associations with the same methodology in every 6-8 years

3.2.20 ACTION E.4: After-LIFE Conservation Plan

The aim of the action is preserving the principal activities in a systematic way in the long run.

What has been done: The LIFE+ management team based on the actions, monitoring data and results, following the reconciliation with partners and thoughts that arose during the compilation of the final report prepared an after-life conservation plan in the fourth quarter of 2013 (Annex 47). The plan was handed over to the partners and to the most important authority TIKÖFE and TIKÖVIZIG.

Reasons for divergence from the project plans: All activities were started in time and according to the plans. The intended target of the action has been 100% achieved.

Evaluation: To maintain the long time effect of the achieved goals two important management activities are required. One is the long term upkeep of ecologically high level of grazing, that can be ensured with the tenure contract between HNPD and farmers. In the most valuable sodic parts of Nagy-szik grazing is likely to be provided by HEA. The other important aspect to regulate water levels that can be ensured by HEA based on a contract agreement between the association and TIKÖVIZIG. Some minor threats still are present, like the forested patches in the catchment and the Magdolna-ér in Magdolna-puszta. These can be efficiently tackled with a well conceived and prepared project in the next 5-10 years. The funding could be from LIFE. The plan identifies the various parties and their activities to ensure the long time upkeep of the results; and also the necessary steps to eliminate the remaining threats.

Analyses of long term benefits and perspective for continuing the action: HEA is considering the review the experiences gathered with the operation of the water management structures and draft a new plan if necessary and send it to the affected parties.

6. Financial part

6.1 Summary of Costs Incurred

The breakdown and the ratio of the incurred expenditure by HEA and its partner meet the criteria laid out in Article 15.2 of the Common Provisions. In consumables we have 7 493 Euros above the rate expenditures that we reserve in case an ineligible cost is discovered. For the overheads we applied the 7% rule as laid out in the common provisions.

Table 14. Summary of cost incurred

| PROJECT COSTS INCURRED | | | |
|------------------------|---|--|-------|
| Cost category | Budget according to the grant agreement | Costs incurred within the project duration | % |
| 1. Personnel | 302,174 | 327,103 | 108.2 |
| 2. Travel | 17,722 | 25,128 | 141.8 |

| | | | | |
|----|---|------------------|------------------|-------|
| 3. | External assistance | 598,385 | 638,313 | 106.7 |
| 4. | Durables: total <u>non-depreciated</u> cost | 448,846 | 460,071 | 102.5 |
| | - <i>Infrastructure sub-tot.</i> | 311,573 | 306,154 | 98.2 |
| | - <i>Equipment sub-tot.</i> | 137,273 | 153,917 | 112.1 |
| | - <i>Prototypes sub-tot.</i> | 0 | 0 | 0 |
| 5. | Consumables | 40,477 | 70,477 | 174.1 |
| 6. | Other costs | 43,362 | 25,944 | 59.8 |
| 7. | Overheads | 18,161 | 108,293 | 596.3 |
| | TOTAL | 1,469,127 | 1,655,329 | 112,7 |

For land purchase we budgeted 88 379 Euros, actual expenditure was 47 596 Euros.

The total budget for the project was 1 557 507 Euros, actual expenditure was 1 702 925 Euros, that is 9.3% extra over the budgeted.

The 145 418 extra expenditure derives from the non-refundable VAT, the economic crisis, and the increase of fuel prices (C1-C3 – construction works) and the extended project implementation.

6.2 Accounting system

Expenses are debited from a separate bank account. On invoices issued based on the contracts our LIFE+ project number is always shown. Also, all invoices related to LIFE+ are stamped and signed by the project manager so that the accountants are able to bring the LIFE+ project expenses to book separately, complying with national accountancy regulations. Similarly, LIFE+ bank interests are handled separately. All invoices related to LIFE+ are being accounted with VAT as we cannot recover VAT according to the APEH statement (tax office) (see Mid Term Report Annex 8.1). HNPd can reclaim VAT whereas FNB cannot (see both in Annex 48). The TPF activities have no VAT implications; therefore no document was attached in this case. Employees signed their timesheet upon arrival and leaving work, HEA manager checked these and counter signed. Working time was calculated by the accountants based upon the approved timesheets and salary and contributions calculated. HEA management received the payroll from the accountants and made the payments to the employees and the authorities.

6.3 Partnership arrangements

The project partners received their actual grant payment prior to the realisation of their actual cost incurring (by personal or telephone confirmation). Prior to the reports HEA requested a technical and financial report from the partners that served as the basis of the data entered into the financial forms. The same procedure was followed in the case of the final report when partners gave a final summary of their activities and costs. Based on these summaries HEA management compiled the final report and filled out the final financial tables. The legal framework was provided by partnership contracts that were signed in the beginning of 2009. See Inception report Annex 7.1. There was no need to add or change anything in the existing agreements.

6.4 Auditor's report/declaration

Name and address of the external auditor, if required under the terms of the Common Provisions. The auditor's report (to be included with the financial report) follows the format of the standard audit report form available on the LIFE website, in particular the auditor must in section 7 clearly state that the financial report is in compliance with the LIFE+ Programme Common Provisions, the national legislation and accounting rules (Annex 49.)

6.5 Summary of costs per action

Table 15. Summary of cost per action

| Action no. | Short name of action | 1. Personnel | 2. Travel and subsistence | 3. External assistance | 4.a Infrastructure | 4.b Equipment | 4.c Prototype | 5. Purchase or lease of land | 6. Consumables | 7. Other costs | TOTAL |
|------------|----------------------------|--------------|---------------------------|------------------------|--------------------|---------------|---------------|------------------------------|----------------|----------------|--------|
| A1 | Devise action plan | 8,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,000 |
| A2 | Water management plan | 0 | 0 | 25,236 | 0 | 0 | 0 | 0 | 0 | 717 | 25,953 |
| A3 | Feasibility studies | 0 | 0 | 7,958 | 0 | 0 | 0 | 0 | 0 | 0 | 7,958 |
| B1 | Purchase of sodic lake bed | 0 | 0 | 0 | 0 | 0 | 0 | 9,543 | 0 | 0 | 9,543 |
| B2 | Perchase of catchment area | 0 | 0 | 0 | 0 | 0 | 0 | 38,053 | 0 | 105 | 38,158 |

| | | | | | | | | | | | |
|------------|---|---------|--------|---------|---------|---------|---|--------|--------|--------|-----------|
| C1 | Exclusion of wastewater | 0 | 331 | 185,200 | 0 | 0 | 0 | 0 | 0 | 198 | 185,729 |
| C2 | Restoration of water regime | 0 | 0 | 152,572 | 11,124 | 0 | 0 | 0 | 0 | 0 | 163,696 |
| C3 | Sodic lake restoration | 0 | 0 | 103,000 | 0 | 0 | 0 | 0 | 0 | 0 | 103,000 |
| C4 | Sustainable high level of grazing | 79,090 | 11,268 | 46,864 | 86,291 | 112,409 | 0 | 0 | 68,437 | 17,670 | 422,029 |
| C5 | Set back neophyte plants | 0 | 0 | 1,119 | 0 | 879 | 0 | 0 | 0 | 77 | 2,075 |
| C6 | Collect and transport waste | 0 | 0 | 565 | 0 | 0 | 0 | 0 | 0 | 120 | 685 |
| C7 | Increased presence of wardens | 16,207 | 5,730 | 0 | 0 | 2,618 | 0 | 0 | 0 | 0 | 24,555 |
| D1 | Eco-centre, demonstration network | 1,018 | 67 | 3,263 | 208,163 | 21,098 | 0 | 0 | 2,040 | 3,282 | 238,931 |
| D2 | Eco-tourism services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| D3 | Layman's report, articles, publications | 0 | 0 | 18 | 0 | 4,625 | 0 | 0 | 0 | 1,002 | 5,645 |
| D4 | Website | 0 | 0 | 2,175 | 0 | 0 | 0 | 0 | 0 | 202 | 2,377 |
| D5 | Book on sodic lake protection | 0 | 870 | 58,897 | 0 | 0 | 0 | 0 | 0 | 195 | 59,962 |
| E1 | Overall project operation | 222,788 | 6,862 | 5,673 | 576 | 3,401 | 0 | 0 | 0 | 2,376 | 241,676 |
| E2 | Monitoring of avifauna | 0 | 0 | 31,773 | 0 | 8,108 | 0 | 0 | 0 | 0 | 39,881 |
| E3 | Monitoring of flora | 0 | 0 | 14,000 | 0 | 779 | 0 | 0 | 0 | 0 | 14,779 |
| Over-heads | | 22,897 | 1,759 | 44,682 | 21,431 | 10,774 | 0 | 0 | 4,933 | 1,817 | 108 293 |
| | TOTAL | 327,103 | 25,128 | 638,313 | 306,154 | 153,917 | 0 | 47 596 | 70,477 | 25,944 | 1 702 925 |

Comments:

- 1) Personnel: The general project management and coordination was not subdivided between the budget entries, but all was listed under Action E1, that includes almost the entire salary and costs of the project manager, field and office assistant. Part of the budgeted village edge grazing system from external assistance was transferred to

personnel as in the last 5 months of the project the partner employed one full time staff (Juhász Tibor) to carry out the related tasks.

- 2) Travel: the amount of allocated for action C4 increased significantly for the previously detailed reasons and also the purchase of winter fodder required more supervision.
- 3) External assistance: Actions C1, C2, C3 increased slightly due to the financial crisis induced price rise. Monitoring costs increased due to the expanded project term.
- 4) Infrastructure: The costs of visitor centre doubled as its size also doubled – following the EC's approval.
- 5) Equipment: Under Action C4 we accounted the total cost of the purchased binoculars as the project was fully and successfully implemented.
- 6) Consumables: The significant increase of Action C4 was caused by the earlier start and the prolongation of the project.
- 7) Other costs: Under Action C4 there is a significant decrease as racka sheep and domesticated geese were placed under equipment to meet national accounting legislation.