LIFE Project Number

LIFE12 ENV/AT/128

FINAL Report

Covering the project activities from 01/07/2013 to 31/03/2018

Reporting Date

8/10/2019

LIFE+ PROJECT NAME or Acronym

Integrated Lake Management of the Urban Lake "Alte Donau"

Project Data

Project location	Vienna
Project start date:	01/07/2013
Project end date:	31/03/2018
Total Project duration (in months)	57 months
Total budget	€ 3,616,050
Total eligible budget	€ 3,275,800
EU contribution:	€ 1,637,900
(%) of total costs	45
(%) of eligible costs	50

Beneficiary Data

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2. Executive Summary

The project started in July 2013 and ended in March 2018. The objectives, key deliverables and outputs are summarized below:

Project Objectives

1. Implementation and Demonstration of Integrated Lake Management in an intensively used urban environment in the context of the city's governance practices
2. Reduction of the vulnerability of the "Alte Donau" to climate change impacts and other anthropogenic pressures
3. Maintaining and ensuring good ecological status (WFD) and good bathing water quality (Bathing Water Directive) through the implementation of innovative technologies and methods adapted to the special conditions of the "Alte Donau"s urban environment
4. Achieving and maintaining a stable aquatic environment in an intensively used urban environment through sustainable management procedures
5. Maintaining and improving the socio-economic benefits for the population and stakeholders in connection with sustainable urban development
6. Improvement of communication with and participation of citizens and stakeholders

Overarching goal is an interdisciplinary and cross sectorial strategic water management approach to overcome the traditional sectorial approach.

Key Deliverables

- Development of Integrated Lake Management Plan "Alte Donau" (Action B1)
- Development of Risk Management Plan "Alte Donau" (Action B2)
- Actions for management of the aquatic environment (Action B3)
- Actions for the improvement of the water regime of the Upper "Alte Donau" (Action B4)
- Actions to improve the control of the quantitative water management (Action B5)
- Actions for restoration of shore areas and creation of protection zones along the banks and within the "Alte Donau" (Action B6)
- Actions for protection and improvement of recreational use as well as integration in sustainable urban development (Action B7)

Outputs

- Accelerated implementation of the Integrated Lake Management
- Prevention or minimization of incidents through Risk Management
- Increased re-establishment of "good status" and of bathing water quality after an unavoidable incident
- No increase of human and financial resources for operation, maintenance and for quick intervention in case of an incident despite increasing anthropogenic influences
- Establishment of a monitoring system by means of indicators to control the achievement of objectives

- There are several cities with similar standing water bodies all around Europe. The innovative and sustain approach of the project acts as a role-model and will contribute to achieving the objectives of the EU environmental policy.

Below, each chapter of the mid-term report is summarized briefly:

Chapter 3 – Introduction

The "Alte Donau" in Vienna is a standing water body within an intensively used urban environment and one of the most popular recreation areas within the City of Vienna. The essential environmental problem is the long-term endangerment of the good ecological status and the bathing water quality, caused by increasing pressure through urbanization, usage, limited groundwater exchange and climate change impacts.

Main objective of the project was to counteract these impacts with an Integrated Lake and Risk Management (demonstrated by this project). Actions in the area of water condition, water balance, aquatic environment, natural environment and recreation were taken. These measures contribute to increase the resistance and resilience against external impacts on the eco-system to secure both the habitats of flora and fauna on a sustainable basis (good ecological status) and the use for citizens as a valuable recreation area (good bathing water quality, use for leisure activities).

Furthermore, the project demonstrated a successful dissemination by active communication and integration of stakeholders and citizens to enhance the socio-economic benefits.

The results of the project were propagated through dissemination and networking activities like visits of other European city administrations, national and international presentation of the project (expert conferences, working groups, excursions) and for citizens and stakeholders on a local scale.

The Integrated Lake Management especially aims to support the attainment of the objectives of the European Water Framework Directive and the European Bathing Water Quality Directive.

Chapter 4 – Administrative part

At the beginning of the project a project manual was developed which was continually updated within the project duration. In addition to the project team a management team was nominated. The technical and financial project controlling took place within regular team meetings. These meetings were protocolled and are listed within chapter 4.1. No essential changes within the project organization were necessary.

The communication with the European Commission and the Monitoring Team was excellent. The project was visited five times by the responsible monitoring expert and twice by representatives of the European Commission.

Chapter 5 – Technical part

Chapter 5.1 Technical Progress (Measures A – C)

The **preparatory measures (A)** started with short delay but this had no lasting consequences. The necessary transfers of administrative responsibilities (**A1** and **A2**) were implemented. Design of the improved weir for the "Hebergraben" (outlet structure) (**A3**) was completed timely.

Besides the permit according the provisions of the national Water Rights Act (10/2015) an unexpected Nature Conservation Act approval for the submersed soil filter (**A4**) – due to a

beaver lodge in close proximity – was necessary (11/2015). Furthermore, a traffic regulation permit was obtained (3/2016).

Some of the **implementation measures (B)** started with a 5-6 month delay due to the delayed certification of the grant agreement, but this had no essential impact on the overall project progress.

The development of the Integrated Lake Management Plan and the Risk Management Plan **(B1** and **B2**) started with first draft versions in 2015. The plans were updated constantly since, and a final version was compiled at the end of the project in 11/2017. The management tools enable decision makers to quickly find and select measures for the compensation of undesired developments, e.g. of water quality. The update of the hydrological balance which was also part of this task was finished in 11/2014 and earlier than foreseen in order to have it ready in time for the improved planning of the soil filter (B4).

A number of measures to foster, protect und safeguard the aquatic environment (**B3**) and to optimize maintenance work were taken. The most important part of the biocoenosis management was a much more efficient dGPS-assisted mowing, which started in early summer 2014: the mowing boats were equipped with the necessary technology (GPS, sonar, soft- and hardware) and a new supervision boat was acquired in 12/2014.

Moreover, a management plan to enhance the resilience of macrophytes was developed (12/2015). Based on this plan low-growing macrophytes (preferably stonewort species) were planted to increase the biodiversity of macrophytes and to reduce the mowing effort in the long run. In 2017 an area of about 20.000 m^2 was cleared and low-growing stonewort species were planted.

Around the Alte Donau 245 trees were planted and invasive plants were removed to secure the location-typical tree vegetation for the future. To preserve both beavers and trees, chicken wire was used to protect valuable trees from damage by beavers while willows and poplars were planted to serve as designated winter diet for beavers in the future.

A prototype of a submerged soil filter (**B4**) for the controlled passage of nutrient-poor water from the Neue Donau into the upper Alte Donau was built and put into operation in 08/2016. The main function of the new biological filter bed is to remove nutrients, primarily phosphates, from the inflowing water before it is fed into the Alte Donau. The inflow of water from the Neue Donau contributes to the compensation of both the water deficit and the calcium deficit in the Alte Donau.

Within the framework of measures to improve quantitative water management (**B5**) the reconstruction of the measuring weir at the outlet structure of the "Hebergraben" was implemented in 12/2014. The water quantity control, originally planned at the outlet structure, was constructed together with the submersed soil filter (B4) due to efficiency reasons.

Bankside renaturation measures at feasible plots (Donaufeld, Broßmannplatz, Kaiserwasser, Untere Alte Donau) were taken (**B6**) and finished in 07/2016. In addition, the banks along the newly adapted areas ArbeiterInnenstrand and Strombucht were designed near-naturally. Furthermore, a number of measures were taken on the small scale to foster near-natural areas, calm sections and protected zones in the open water were designated.

Concerning the preservation and improvement of the leisure quality (**B7**) the main activity of this task was the adaptation and renaturation of the area "ArbeiterInnenstrand" (opening 05/2015) after the ownership was transferred to the City (see action A1). At the lakeshore between Drygalskiweg and Mühlschüttelgasse on the upper section of the Alte Donau 20 new grassy terraces with wooden backrests were installed to create level relaxation bays for

visitors in 6/2016. To improve access to the Alte Donau for people with limited mobility (e.g. depending on wheelchairs), the barrier-free sections of footpath have been extended and steps on the lakeshore promenade have been replaced by a ramp. Task B7 was finished in 2016.

The project was accompanied by biological (beaver, benthic invertebrates, fish, amphibians, trees, biotopes and macrophytes) and chemico-physical monitoring (**C1**). All in all, the results confirm the positive effects of the measures implemented.

The socio-economic study (**C2**) gathered data on user behaviour, social and public space around the lake, and a wide range of user and stakeholder groups were surveyed. To summarise, people appreciate the Alte Donau as a tranquil, laid-back place, and do not want to see it further "eventified". The measures taken within the LIFE+-project were highly appreciated.

The management and monitoring of the project progress was performed as planned (**E1**). On a regular basis controlling and management team meetings are held. For cost recording a dedicated Excel-based tool was developed, recording and showing all costs in respect to each measure. As time recording and accounting tool the internal SAP-system was used.

Several workshops, meetings and conferences were attended by project-team members and numerous LIFE-Projects (**E3**) were contacted.

The After-LIFE-Communication-Plan (**E4**) documents the intended continuation of activities beyond the project duration.

Chapter 5.2– Dissemination measures

The first dissemination measure was placing the project-homepage online on 31.12.2013, which was regularly updated since (**D1**). To inform the public about the LIFE+-project and for a better orientation in the area six large information boards were installed along the shoreline of the “Alte Donau” (**D2**). These boards are linked with a specially developed mobile-phone app (“Wasserweg”; “Water Path”), which allows users to retrieve information at 21 places around the “Alte Donau”. In addition, a comprehensive guidance system was installed in 2015.

Two layman’s reports (**D3**) giving a comprehensive overview on the main topics of the project were published (2/2016 and 3/2018). The second and more detailed version is also available in an English version.

A large amount of information material has been prepared and disseminated (**D4**), e.g. three information folders, an annual paper with focus on the LIFE-project “Alte Donau” and three video clips promoting the project. Several information events were held, e.g. “daughter’s day”, city walks, “day of biodiversity”, excursions with school classes, lectures etc. (**D5**). Furthermore, a LIFE+-branded delivery-e-bike that can be transformed into a mobile information desk during events was purchased. Information concerning the LIFE-Project was presented at all events the MA 45 participated in. Dissemination actions targeting expert groups (**D6**) with several workshops took place and MA 45 staff participated at several specialist events. The final conference was held after the regular project duration in 5/2018.

Chapter 5.3 Evaluation of Project Implementation

In general, the methods applied were successful and measures were successfully implemented according to schedule. Transfer of administrative responsibility (**A1**) was realized and planning of renaturation and leisure value improvement (**A2**) as well as planning and tendering for the modernization of weir “Hebergraben” (**A3**) were finished in time.

The management plans (**B1** and **B2**) were designed in a first draft version at an early stage of the project, permanently updated and applied. The plans revealed the complexity of the

system and much more discussion for the development was needed than initially thought. Measures concerning the aquatic environment (**B3**) were completed as planned with minor time lag and the related monitoring shows the positive effects (e.g. development of low-growing macrophytes, tree protection, beaver population).

Upgrading the weed harvester with a dGPS-System made mowing management much more efficient and contributes substantially to the aquatic environmental management by saving time and costs. Implementation of the submersed soil filter (**B4**) was delayed but the construction work was finalized quickly. The costs for the filter bed were higher than originally assumed but, as the filter is a prototype, no empirical values were available before the project started. The reduction of phosphorous and suspended particles works very well and additional water supply to enhance the quantitative water balance is guaranteed in future.

The modernization of weir "Hebergraben" (**B5**) was finished earlier than expected but the task was partly shifted to **B4** (remote control). For renaturation measures (**B6**) feasible plots were identified and measures were finished as intended. Replacement plantings were necessary in some spots due to highly intensive use. Since then, the vegetation develops satisfactorily.

Measures to develop recreation areas (**B7**) were realized with the successful takeover of shore properties by the City of Vienna with a simultaneous implementation of a "close-to-nature" landscape design (B6).

Monitoring (**C1**, **C2**) was successful and implemented as planned. The methods applied were mostly standards methods whose functionality was proven but had to be adapted to the specific questions and circumstances. Overall the results show the success of the project measures. As mostly biological monitoring was carried out it is obvious that success or failure of a measure cannot always be evaluated immediately. The effects of some measures can only be assessed over a longer period of time.

Dissemination and communication measures (**D1**-**D5**) were implemented successfully during the entire project period. Population and stakeholder were more intensively involved in the management and information process. Especially the establishment of a "round-table" addressing associations and businesses has been evaluated very positively.

Project management was conducted according the proven internal standards of the City of Vienna.

Chapter 5.4 Analysis of the long-term benefits

The project contributes to save energy resources and emissions by shifting to a very efficient dGPS-supported mowing management and contributes to climate adaptation by fostering green infrastructure. It adds to the goals of the European Water Framework Directive and the European Bathing Water Quality Directive and supports the Biodiversity Strategy according to the EU Environment Action Programme.

The prototype soil filter as well as the safeguarding of near-natural areas will have a long-term effect and the successful implementation of the management plans will save resources and costs in the long run.

Concerning long-term social benefits, the project contributes to the socio-economic value by securing the recreation value and therefore securing jobs. Furthermore, it adds to the quality of life for citizens and has a positive climatic effect for the immediate neighbourhood.

The project will be continued by implementing the management plans, further renaturation measures and participation of stakeholders and citizens. Results of the project such as the management plans and the dGPS-supported mowing could be implemented in a similar way elsewhere.

Mowing management and measures like the soil filter are innovative systems that clearly demonstrated its practicability to reduce effort and costs.

Indicators of the project success in the long-term will be the conservation of good bathing water quality, good ecological water quality and the conservation of species, habitats and biodiversity.

Chapter 6 Comments on the financial statement

The financial statement of the incurred costs is summarized in Chapter 6. Expenses amount to about EUR 5.130.000, which is about 140% of the total budget acc. to the project application (3.620.000). It is clear to the beneficiary that the total EU-contribution is limited to a maximum amount of EUR 1.637,900 as stated in the Grant Agreement and that eligible costs for single cost categories are limited to 10% and EUR 30.000 (cf. art. 26 of the Grant Agreement).

Major discrepancies between real costs per action and costs set out in the grant agreement occurred within several actions. Major **additional** costs occurred within actions B2 (risk management plan), B3 (biocoenosis management), B6 (renaturation measures), B4 (soil filter - prototype), B7 (leisure value measures) and C1 (monitoring of effects); major **reduced** costs within actions B5 (water distribution), D6 (dissemination to experts and administrations) and D2 (info boards).

Chapter 7 Annexes

Administrative Annexes (7.1) include additional information and justifying documents as requested in letters from EC. The annexes are listed and described. Technical annexes as well as dissemination annexes are listed and described in chapter 7.2 and 7.3.

Chapter 8 Financial Report and Annexes

The full financial report and the Audit Report are submitted with the final report.

In case of a reduction of eligible costs by the European Commission we request to submit a formal request for changes of the Grant Agreement according article 15.3 of the GA.

In case of a reduction of eligible costs by the European Commission during financial review (and the result that the EU contribution will be reduced) we will submit a formal request for changes (acc. to art. 15.3, GA) for budget reallocation (acc. to art. 15.2, GA) from cost category “Consumables” to cost category “Prototype” in the amount of EUR 57.000.

3. Introduction

3.1. Description of background, problem and objectives

Background

Since time immemorial, the city of Vienna has been inseparably linked with the River Danube. Due to major regulation works (completed in 1875), what used to be the main bed of the Danube, became the Alte Donau: a large shallow lake with a surface area of around 1.6km². Over time, the Alte Donau also became one of the most popular destinations for people in search of recreation and relaxation in the city of Vienna. Flood protection measures and the construction of the hydroelectric plant greatly diminished the natural fluctuations in the groundwater table with the consequence of massive eutrophication in the 1990ies. A comprehensive restoration programme improved the water quality significantly.

Problems

Today, the Alte Donau is facing major challenges: Rapid population growth and the lake's central location mean that numbers of people visiting the Alte Donau are set to rise further in the future. Climate change and significantly reduced groundwater exchange are having an effect on the Alte Donau, as higher water temperatures (and increasing sunshine duration) are stimulating the growth of the underwater plants and are threatening aquatic animals.

Objectives

The main objective of the LIFE+-project was to safeguard the Alte Donau for the long-term, both as an ecologically valuable habitat and as a popular local recreation area. The establishment of sanctuaries, the renaturation of shorelines and the increase in diversity within the macrophyte assemblage increased the resilience of the water body to environmental influences. With the possibility of a permanent water supply establishment via a biological filter bed (soil filter) in the inlet, a permanent improvement of the water balance and the buffer capacity against pH fluctuations could be achieved. At the same time, the visitor facilities have been expanded, e.g. by opening up areas for public use. A dedicated set of measures served to inform the public and local businesses about management and measures and to obtain feedback from citizens and stakeholders.

3.2. Expected longer term results

The measures undertaken within the LIFE+ project on site (actions **B3** – **B7**) and the development of an integrated water and risk management plan (actions **B1** and **B2**) play an important role in safeguarding the Alte Donau for the long-term, both for wildlife and citizens and they reduce the costs for maintenance, save resources and reduce greenhouse gases. Furthermore, it promotes the socio-economic benefits for citizens, associations, clubs and businesses and improves the communication with citizens and stakeholders.

In the European context and EU environmental policy - water, nature and urban environment - the project contributes to the development of water management practices, which support the achievement of the objectives of the EU Water Framework Directive 2000/60/EC, in particular the achievement and maintenance of good ecological status of urban lakes. Furthermore it fosters the conservation and protection of a good bathing quality in accordance with the requirements of the Bathing Water Directive 2000/60/EC. The measures to increase the local biodiversity support protected species and add to the Habitats Directive 92/43/EWG. Finally, the invasive alien species control supports the goals of EU Regulation on Invasive Alien Species (1143/2014).

4. Administrative part (maximum 3 pages)

4.1. Description of the management system

Description and schematic presentation of working method

The project management followed the internal guidelines of the City of Vienna for the implementation of projects. At the project start a project manual was created, which was constantly updated. The project manual includes the following contents:

• project description • project objectives • definition of project scope • work Breakdown Structure • description of measures • organization chart • role descriptions	• budgeting • human resource planning • milestone plan • projekt controlling • connected bar chart • risk analysis • communication plan

Presentation of the coordinating beneficiary and project organization

Within the City of Vienna, the Municipal Department 45 - Water Management is the responsible department for flood protection, revitalization and management of water waterbodies, the ecological and chemical quality of waters (implementation of the Water Framework Directive) and the quantitative and qualitative recording of groundwater. Its most important projects in the field of water management include flood protection on the Danube and thus the maintenance and preservation of Vienna's Danube Island and the dam system as well as revitalization of rivers like Wien River and Liesingbach. The MA45 employs highly qualified personnel in the field of hydraulic engineering, hydrology and project management.

Project organization:

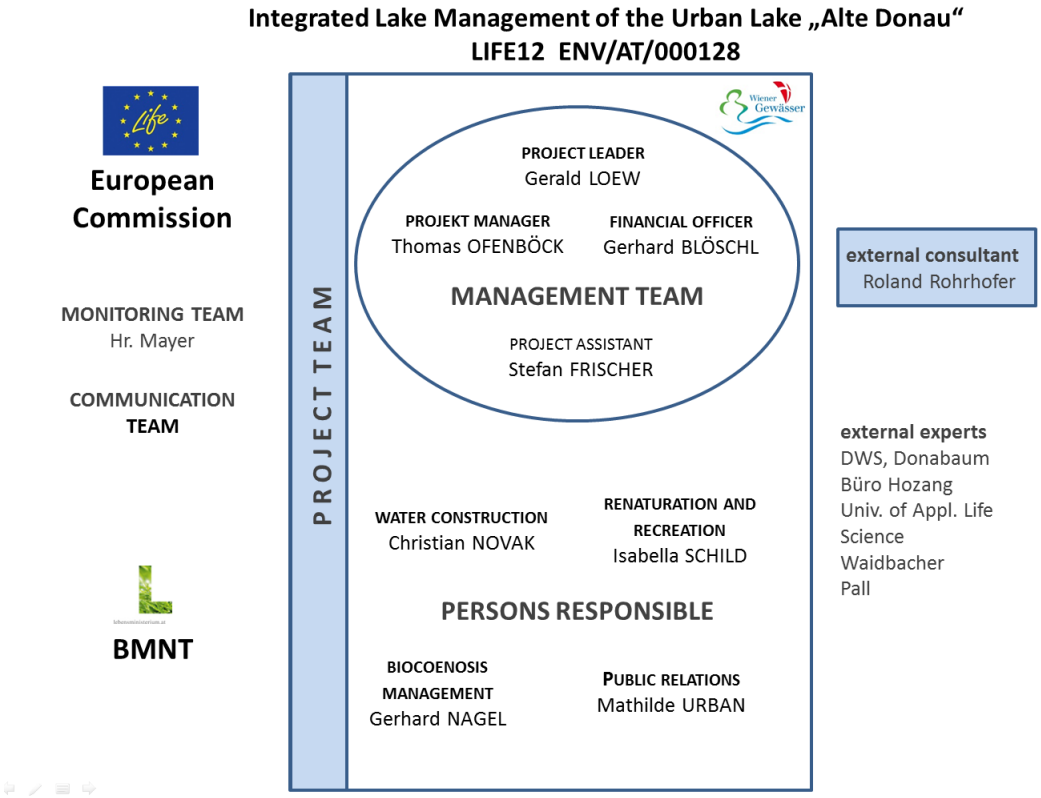


Abb. 1: Organisation chart of the project team

The project was led by the management team ("Leitungsteam") and evaluated continuously in the course of financial control meetings ("Controllingsitzungen").

Within the project duration, there have been no significant changes in the project organization, except for the field of media where Dr. Mathilde Urban, who is in charge of public relations work on the LIFE+ project, has taken over the role of DI (FH) Thomas Kozuh – Schneeberger and in the field of management of natural areas, where DI Isabella Schild has taken over the role of Ing. Peter Riedel.

Overview of the project phases, activities and tasks per phase, planning

An overview of the project phases and activities is given in Chapter 5 (Gantt Chart).

Changes due to amendments to the Grant Agreement

Due to the extreme growth of macrophytes and the delayed finalisation of the soil filter a request to extend the project duration until 31.3.2018 was submitted parallel to the first Progress Report to ensure a sufficient monitoring period. The prolongation of the project was approved in February, 2017 (ENV-D-4 SW/MS/nl 911475). Further, an amendment of the grant agreement was signed. The project duration was extended until March, 2018.

4.2. Evaluation of the management system

Project Management Process

The project management was divided into technical and financial project management and was accompanied by the management team and continuously evaluated in the course of controlling meetings.

Technical project management:

The tasks of technical project management included in particular:

- Development of a project plan and project timetable with milestones to ensure the timely submission of project results
- Development of a project manual
- Accompanying the content, scope and quality of the project - in particular monitoring of compliance with project objectives and application
- Identifying project risks to recommend appropriate countermeasures if needed
- Reporting to the European Commission
- Participating in project meetings and creating logs

Financial project controlling:

The tasks of financial project controlling included in particular:

- Development of a budget plan based on the budget of the grant agreement for controlling and determining current financing needs and flows
- Development of a project-specific, structured accounting system in accordance with the requirements of LIFE + and the existing accounting programmes of MA 45
- Development of project-specific controlling instruments, in particular for target / actual comparison, variance analysis, consequence analysis and risk analysis
- Preparation of contracts for external services, in particular with regard to compliance with the requirements of LIFE+
- Accompanying control of measures for financial compliance with the application as well as showing possibilities for optimizing project costs and costs
- Continuous monitoring of budget compliance, including identification of project risks, to recommend appropriate countermeasures if needed

- Financial reporting to the European Commission
- Participation in the project leadership meetings and participation in financial aspects of the report creation

For cost recording a dedicated Excel-based tool was developed, recording and showing all costs in respect to each measure. With this tool, an up-to-date cost trend of the project was presentable at any given time (also in comparison to the project application). Working time was recorded within the MA 45 SAP-Tool in which time can (and must) be allocated exactly to each project.

Management team:

The management team fulfilled in particular the following tasks:

- Determination of the project plan as well as its control and adaptation during the project
- Determination of the project timetable as well as control and adjustment of milestones - decision on accelerating measures
- Coordination of and decision on the adaptation of project goals and desired project results in case of insurmountable obstacles
- Changes in responsibilities
- Approval of reports and accounts with LIFE+

Internal project evaluation, quality assurance / quality management

- Coordination meetings (coordinator, executive officers) - regular
- Executive officer meetings - on an ad-hoc basis (responsible executive officers and his team, external)
- Biennial management team meetings for decision-making and documentation
- Controlling sessions: the quarterly controlling meetings in which the entire project team (management team + case officers) and the external consultant participate serve to determine whether the project requirements have been achieved so far. Quarterly controlling reports were prepared.
- For each session, an attendance list was created and a log was written. The meetings or meetings held are shown in the table below.

Kind of meeting / session	**Date**
Kick-off meeting	23.-24.09.2013
Kick-off workshop	18.10.2013
Meetings of the management team („Leitungsteambesprechung“)	16.12.2013, 18.3.2014, 1.10.2014, 10.3.2015, 22.6.2015, 22.9.2015, 27.1.2016, 7.6.2016, 21.9.2016, 3.2.2017, 26.9.2017
Financial control meetings („Controllingsitzung“)	19.12.2013, 5.3.2014, 11.6.2014, 22.9.2014, 18.2.2015, 12.5.2015, 7.9.2015, 19.1.2016, 25.5.2016, 19.9.2016, 24.2.2017, 21.9.2017
Visit of the Monitoring Team („MoT“)	18.10.2013, 26.11.2014, 27.3.2015, 13.9.2016, 13.3.2018
Visit of the EU Commission/EASME	27.3.2015, 17. - 18. 5.2018 (final conference)

The management process worked as initially intended.

Communication with the Commission and Monitoring Team

The project has been visited five times by the monitoring team and twice by representatives of the Commission/EASME. Emerging issues or problems could always be answered or solved quickly. From the beneficiary’s point of view the communication with the Commission and the monitoring team was very satisfactory.

5. Technical part

5.1. Technical progress, per task

Actions	Foreseen start date	Actual start date	Foreseen end-date	Actual end-date
Preparatory actions				
A1: Planning of renaturation	01.10.2013	18.10.2013	30.09.2014	30.05.2015
A2: Planning of leisure value measures	01.10.2013	18.10.2013	30.09.2014	Aug.15
A3: Planning of weir "Hebergraben"	01.10.2013	18.10.2013	30.06.2014	31.10.2014
A4: Other permits	01.01.2014	Jän.15	31.12.2016	Mär.16
Implementation actions				
B1: Water management plan	01.10.2013	18.10.2013	30.11.2017	31.12.2017
B2: Risk management plan	01.04.2014	01.02.2014	30.11.2017	31.12.2017
B3: Biocoenosis management	01.10.2013	18.10.2013	30.06.2017	Sep.17
B4: Water balancing upper "Alte Donau"	01.10.2013	18.10.2013	31.03.2016	Aug.16
B5: Water distribution lower "Alte Donau"/ "Obere Lobau"	01.07.2014	01.07.2014	28.11.2014	Aug.16
B6: Renaturation measures	01.07.2014	Feb.15	30.12.2016	Jul.16
B7: Leisure value measures	01.10.2013	18.10.2013	30.09.2016	Jul.16
Impact monitoring				
C1: Monitoring of effects	01.07.2013	18.10.2013	31.03.2018	31.03.2018
C2: Socioeconomic study	01.07.2013	18.10.2013	30.03.2017	30.09.2017
Dissemination				
D1: Project website	01.10.2013	18.10.2013	31.03.2018	30.06.2018
D2: Info boards	01.10.2013	18.10.2013	31.03.2018	31.05.2014
D3: Layman's Report	01.07.2015	Jul.16	31.03.2018	30.06.2018
D4: Media work, info material	01.10.2013	18.10.2013	31.03.2018	31.03.2018
D5: Local dissemination integrating interested stakeholders	01.07.2013	18.10.2013	31.03.2018	31.03.2018
D6: Dissemination to experts and administration	01.07.2013	18.10.2013	31.03.2017	31.03.2018
Management				
E1: Project management	01.07.2013	01.07.2013	31.03.2018	31.03.2018
E2: Training of project staff	01.01.2014	Mär.14	30.03.2016	Sep.16
E3: Networking	01.10.2013	18.10.2013	31.03.2018	31.03.2018
E4: After LIFE Communication	01.10.2016	31.03.2018	31.03.2018	30.06.2018

	2013						2014												2015												2016												2017												2018		
Actions	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Preparatory actions																																																									
A1: Planning of renaturation				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																																			
A2: Planning of leisure value measures				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																																	
A3: Planning of weir "Hebergraben"				x	x	x	x	x	x	x	x	x	x	x	x	x																																										
A4: Other permits																			x	x	x	x	x	x	x	x	x	x	x	x	x	x																										
Implementation actions																																																									
B1: Water management plan				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
B2: Risk management plan								x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
B3: Biocoenosis management				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
B4: Water balancing upper "Alte Donau"				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																						
B5: Water distribution lower "Alte Donau"/ "Obere Lobau"													x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																						
B6: Renaturation measures																				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																						
B7: Leisure value measures				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																						
Impact monitoring																																																								
C1: Monitoring of effects				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
C2: Socioeconomic study				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Dissemination																																																							
D1: Project website				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D2: Info boards				x	x	x	x	x	x	x	x																																												
D3: Layman's Report																																				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D4: Media work, info material				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D5: Local dissemination integrating interested stakeholders				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D6: Dissemination to experts and administration				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Management																																																							
E1: Project management	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
E2: Training of project staff									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																						
E3: Networking				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
E4: After LIFE Communication																																																							x

x .... Actual ... foreseen

(Projects submitting final reports after 1 January 2014 must use this format.)

Action A: Preparatory actions

Foreseen actions in the Grant Agreement
A1: Planning of renaturation
A2: Planning of leisure value measures
A3: Planning of weir "Hebergraben"
A4: Other permits

Description of the state of play of this action:

The task has started with the internal kick-off meeting on 18.10.2013 with five months delay as the signature of the Grant Agreement (13.10.2013) was later than anticipated (01.07.2013) and thus the project started with a delay of 5 months.

A1) Planning of renaturation:

Transfer of administrative power over the areas (background: complex ownership) and detailed planning of renaturation of river banks and protected zones.

Finished. The transfer of administrative power, clarification of responsibilities and planning of renaturation of river banks and protected zones were completed in 5/2015.

A2) Planning of leisure value measures:

Transfer of administrative power over the areas (background: complex ownership) and detailed planning of the leisure value improvement.

Finished. The transfer of administrative power, clarification of responsibilities and planning of the leisure value improvement were completed in 8/2015. The transfer decisions had already been taken in April 2014 but the formal notification took some more time. Most important outcome was the transfer of the area of the "Arbeiter-Schwimmverein", a considerable area usable for recreation which was adapted for public use.

A3) Planning of weir "Hebergraben":

Planning documents, tendering of equipment for weir "Hebergraben"

Finished in 10/2014, implementation in task B5. The Plans were completed in 10/2014. The planning and implementation was changed to be carried out in 2 steps:

a) Modernisation of the weir as planned and

b) Installation of remote control for discharge control. The installation was shifted to the inflow weir (at the subsurface soil filter, agreed by the EC with the letter of 16.1.2015) in order to have better operating security and accuracy. At the Hebergraben (outflow) flotsam (“Schwemmgut”) frequently would impair the function.

A4) Other permit processes (nature conservation, construction)

This optional task was finished in 03/2016. A nature conservation permit for the soil filter and a traffic permit for the time of construction were necessary. The need for a nature

conservation permit for the soil filter (due to beaver lodge close to the construction area) arose during the activities for the hydrological permit (see B4).

Action B: Implementation actions

Foreseen actions in the Grant Agreement
B1: Water management plan
B2: Risk management plan
B3: Biocoenosis management
B4: Water balancing upper "Alte Donau"
B5: Water distribution lower "Alte Donau" / "Obere Lobau"
B6: Renaturation measures
B7: Leisure value measures

Overview of implementation measures

B1) Integrative surface water management plan "Alte Donau"

Finished. A first draft version of the management plan was available in early 2015 and was continuously developed and implemented. The final version was completed in 11/2017. The documents currently cover the period from 2013 to 2017 (the duration of the LIFE+ project).

The integrative water management plan „Alte Donau“ not only covers all conservation and utilisation aspects of the "Alte Donau" but partly also those of adjacent "Neue Donau", "Lobau" and of the national park "Donauauen". A systematic evaluation and decision support tool, which enables to quickly identify and select measures to compensate undesired trends (e.g. concerning water quality) was developed. The integrative management tools allow a fast evaluation of the impact of actions.

As requested by of the EUC in the letter of 4/2015 other departments of the City of Vienna (e.g. MA42 park authorities; MA48 waste disposal and street cleaning; MA49 forests, MA31 drinking water) and further stakeholders were informed about the tool and

it was presented during visits in Bratislava and Budapest, Cross-Border-Workshop, Vienna, Workshops within the EU funding network of the Vienna Magistrate (MD-BD) on 6.6. and 29.6.2016 for participants of different departments.

B2) Risk management plan

Finished. Like for the Integrative water management plan a first draft version of the risk management plan was available in 2015. The plan was continuously developed, and implemented and was also presented in combination with the management plan. The final version was also completed in 11/2017.

The update of the hydrological balance was also part of this task and was finished earlier than foreseen (11/2014) in order to have it ready in time for the improved planning of the soil filter (B4). The update of the mass balance was finished in 12/2015.

B3) Biocoenosis management:

Finished. The task comprised the following sub-tasks:

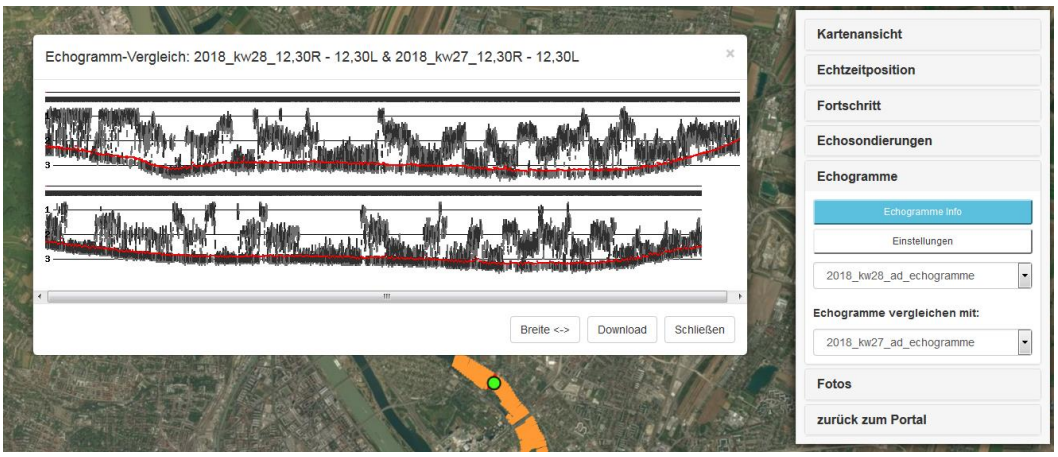
1. Plan to enhance resilience of the macrophyte community:
   Finished in 12/2015. The plan represents an anticipatory strategy for promoting the biodiversity of macrophytes and to increase the stability of the aquatic vegetation.
2. Prototype equipment for 3 mowing boats (GPS, sonar, soft- and hardware, protection against fish damage):

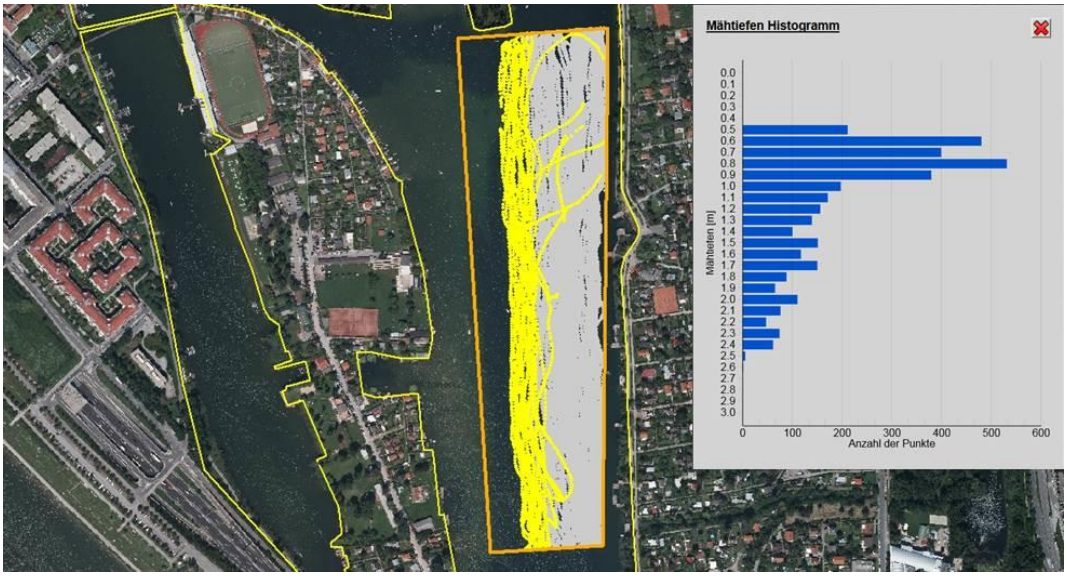
   Finished. The equipment for 3 boats was delivered in 05/2014. Another mowing boat was put into operation in spring 2016.

   The most important part of the biocoenosis management was a much more efficient dGPS assisted mowing, which started in early summer 2014: the mowing boats were equipped with the necessary technology. The new procedure of mowing uses a sonar to create maps of aquatic-macrophyte covered area and plant height, the results are transferred into digital mowing maps. After the selection of preferred mowing areas the mowing can be carried out with GPS support (to clearly detect designated and already mowed areas). Further, the path of the mowing boat can be tracked and supervised in real time via internet.

   Inter alia, the project was prolonged by nine months due to extreme macrophyte-growth. When the proposal for the LIFE+-project was written in 2012, around 30 tons of macrophytes were removed by mowing activities during the entire year. Since 2013 the macrophyte growth increased dramatically. After 200 tons in 2014, mowing had to be extended in 2015 (with a record summer since 250 years) to the entire area of the "Alte Donau" and mowing was carried out more or less continuously. 1.100 tons of mowing material was removed in 2015. In 2016 the summer was even warmer after the warmest winter ever recorded. The three mowing boats were operating six days a week to cope with the unprecedented mass of macrophytes. Despite a relatively cold winter 2016/17 in Vienna, the macrophyte growth in 2017 was even stronger: 2.800 tons were removed between 02/2017 and 09/2017 which is a hundred times more than in 2013. Therefore, the implementation of the mowing system on a small scale – as originally foreseen in the proposal – didn't make sense anymore since the designated mowing area covered almost the entire lake. As a result, the mowing activities and the monitoring strategy had to be adapted as the mowing effort had to be extended significantly. As a consequence, no savings in absolute numbers could be achieved but the cost per area could be significantly reduced and the planning and control of mowing remarkably facilitated by using the newly developed and innovative mowing software.

The adapted GPS-supported mowing system was successfully applied in 2017. In 2018 (post LIFE) larger areas were designated as protected and mowing-free zones. Further, new and additional mowing boats were put into operation.





3. One new supervision boat:

Finished. The supervision boat was acquired in 12/2014 and is permanent and successfully in use since then.

Supervision boat

4. Fostering of suitable vegetation:

Finished. The goal was to foster low-growing macrophytes, preferably Characeae (Stonewort) species which were the dominant species in the Alte Donau in former times.

Low growing macrophytes were planted to increase the biodiversity of macophytes on the one hand and to decrease threats to water quality on the other hand. Various stoneworts, common mare‘s tail (*Hippuris vulgaris*) and several species of pondweed (*Potamogeton spp.*) have been successfully tested and introduced to the lake. The experiments showed that in particular stoneworts grow very well in the Alte Donau, but are preferably eaten by fish, especially rudd (*Scardinius erythrophthalmus)*. To permanently recolonise the Alte Donau with stoneworts, it will require large stable areas – too large to be harmed by fish feeding on them. After initial problems with fish feeding on them, some species locally started to spread and compete with the original mono-culture.

In spring 2017, seven low-growing stonewort species were planted for the first time in a larger area on the bottom of the lake. The area concerned covers approx. 2.5ha and is situated on the right side-arm of the lower section of the Alte Donau, close to the new Strombucht sunbathing lawn, one of the two newly adapted recreation areas within the LIFE+ project.

Prior to planting, a number of preparatory steps were required, including deep mowing followed by clearance of the high-growing plants. To protect the young plants from grazing by fish, as many herbivorous fish as possible were removed and the area was surrounded by a fine mesh net. Finally predatory fish were introduced to keep the stock of herbivorous fish low.

Planting of stonewort / established stonewort (© systema)

5. Integrative beaver / tree management:

Chicken wire was successfully used to protect old and newly planted valuable trees. In addition 70 willows and poplars were newly planted in February/April 2014 and protected from damage by beavers with fences but will serve as food supply in the winter period in the future.

6. Management of woody plants:

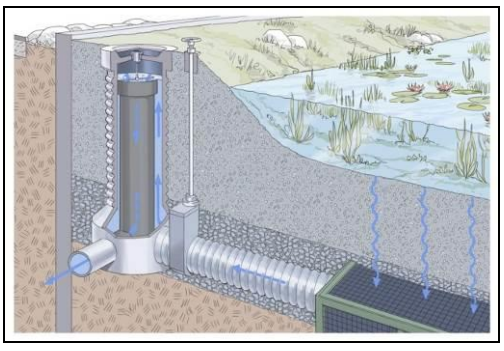
Tree rejuvenation and removal of neophytes was finished in 2016. The age structure and species composition was significantly improved. Mighty old black poplars and willows characterise the typical landscape around the Alte Donau. Many of these huge and impressive old trees have now reached their natural age limit. In order to ensure the long-term preservation of the typical tree species around the Alte Donau, a total of 245 new young trees of habitat-appropriate species have been planted. Invasive, non-native species (neophytes) such as ailanthus and robinia have been removed.


Rejuvenation of trees / protected areas for reforestation

B4) Soil filter: Improvement of the water balance upper Alte Donau by implementation of a submersed filter.

Finished. Planning and construction of soil filter and inflow control station were finished in 08/2016 and are operating since.

The prototype soil filter is a biological filter bed which was built in the Water Park area for the controlled passage of nutrient-poor water from the Neue Donau into the upper Alte Donau. The inflow of water from the Neue Donau compensates for the water deficit in the Alte Donau. The main function of the new biological filter bed is to remove nutrients, primarily phosphates, from the water before it is discharged into the Alte Donau. The water is fed in via an intake on the surface of the filter bed and then passes through the body of the filter from top to bottom. By passing the filter, microorganisms are eliminated, suspended solids are filtered out and nutrients are broken down and absorbed by the biofilm coating on the surface of the granulate. The filtered water collects in a chamber below the filter bed (housing a RIGOL system) and is then discharged via drainage pipes and a sluice structure that regulates the flow. A major advantage of this filter system is its operational flexibility, with a total of five different modes of operation available. These include the option of channelling water from the Water Park through the filter bed via a pump system to specifically reduce water-borne nutrients in the Water Park area.




Soil filter: Scheme of operation / construction work


Soil filter: construction work / view on filter bed after finalisation

Pre-tests of filter material in the laboratory were inserted in order to save space and money with an optimised material (less but better material with better phosphorus retention capacity).

Four planning, external companies were contracted. The general planning was finished in 2014, detailed construction planning in 2015 with a versatile solution, which allows 5 different operating modes (e.g. circulation within upper Alte Donau only, top to bottom or reverse flow through the soil filter, injection of $CaCO_3$ etc.). The filter started its operation in 08/2016.

The active filter size is 2.000m^2 with a 0,6m mighty layer of a special limestone grit. In order to enhance the water quality in the old river bed, the filter

- supports a bio-film to biologically degrade organic material
- physically retains fine particles
- chemically absorbs phosphorus
- passively releases calcium into the water
- enables the injection of lime milk to increase of the calcium content

Delays: A delay occurred due to postponement of the original committee meeting for the budgetary agreement (caused by the state elections in 2015), which in the case of larger expenditures (like the soil filter) has to pass through several committees of the City of Vienna. The delay was reported and accepted by the EUC in 10/2015. Additionally, the insertion of laboratory pre-tests of different types of filter material and the need for a nature conservation permit arose (beaver lodge close to construction area) which added to the delay. The delay impaired the monitoring of the effects (C1), which was the main reason for the prolongation request in September 2016.

B5) Improvement (motorisation, automation, electronic monitoring) of quantitative water control (level decrease each spring) of lower Alte Donau and "Obere Lobau":

Finished: Construction was carried out from 10/2014 to 11/2014.

The water level of the Alte Donau and the backwaters in the Lobau are managed. Surplus water from the Alte Donau is regularly transferred to the Mühlwasser via a connecting canal (Hebergraben). In order to meet requirements of different aspects in response to available water supply (e.g. water rights or the optimum soil filter performance) the connecting weirs will be motorised and centrally controlled in future. However, the automation and remote control for discharge control was shifted from Hebergraben (outflow) to the inflow weir (at subsurface filter, agreed by the EC with the letter of 16.1.2015): The responsible staff has to check the Hebergraben weir for blockages anyway every few days while at the inflow the discharge can be measured much easier and heavy construction took place at the inflow

anyway. The inflow control including the remote control was finalised together with the soil filter and started its operation in 07/2016.

Measure weir Hebergraben

B6) Renaturation of river banks and establishment of protected zones in the river and its banks:

Finished in 07/2016. For this task three pilot projects were proposed to replace a total of 300m solid built bank by renaturated banks. Due to the fact that the type and the ownership of the bank is still quite fractionated (different public and private owners, different uses and different natural values) it was difficult to find suitable patches in the beginning (see IncR and EC letter of 29.04.2014). Finally, four feasible plots for renaturation were identified. One of them was the stretch of the swimming association, with ownership newly transferred to the City of Vienna (see also action B7). Construction started in winter 2014/2015 and lasted until autumn 2015.

Two more stretches of lakeshore on the upper section of the Alte Donau were chosen as pilot zones for restoration. In addition, a large number of individual measures were also implemented to safeguard the ecological function of the Alte Donau and improve biodiversity on land and in the open water.

On the 450m stretch of lakeshore between Drygalskiweg and Mühlschüttelgasse, stones and pebbles have been piled up on the lakebed and then planted with various types of reeds. The second stretch of lakeshore restoration is located in the most northern part of the Alte Donau at Broßmannplatz. Here, bundles of branches have been fixed to the lakebed and were planted with reeds, and a waterlily zone has been planted in the open water.

Reed beds are important habitats for young fish, amphibians and dragonflies as well as a breeding ground for large numbers of reed-dwelling birds. Over time, however, many of the stands of reeds in the Alte Donau have largely dried out and been lost as a habitat for aquatic organisms. To counteract this process, some patches of reeds have been removed to create small pools and ponds for amphibians and young fish and to create new succession areas. Such areas are located at the western shore of the Kaiserwasser arm, alongside Wagramer Straße and around the southernmost tip of the Alte Donau.

Rejuvenation of reed beds

In little or unused zones (mostly close to the lakeshore), a number of permanent refuge zones have been created in which the submerged aquatic vegetation is left unmown. These zones serve as undisturbed spawning grounds and areas of shelter, chiefly for fish.

Planting of wildflower strips in several less frequented areas close to the lakeshore shall improve biodiversity on land, supplying for wild bee species as well as bumblebees and butterflies.

Deadwood is a valuable structural element and habitat in bodies of water, being colonised by countless invertebrates and providing shelter for fish. Away from bathing areas, e.g. in the right arm of the lower section of the Alte Donau, deadwood in the form of tree trunks has therefore been placed in the lake. Trees, which have been felled by beavers or have been fallen into the water for other reasons were left where they have fallen down.

Deadwood along the shoreline as important structures

Measures were finished in 07/2016 (amongst others Donaufeld, Broßmannplatz, Kaiserwasser, Untere Alte Donau). Replacement plantings were necessary in autumn 2016 and summer 2017 at some spots of the pilot area Donaufeld due to highly intensive use. Since then, the vegetation is developing satisfactorily.

Natural embankment designs were performed by own personnel in the area of the Strombucht (an area which was made available to the public in 2016 – independently from the LIFE project).

Outside the LIFE activities renaturation projects will follow at further 3 plots in the project area: Two shallow water zones and two amphibian ponds at the Gänsehäufel island and bank structures between Rossschwemme and Mühlschüttel with a length of 350 m.

B7) Preservation and improvement of the leisure value and integration into sustainable urban development:

Finished. Planning and construction work was carried out in winter/spring 2014/2015 (“ArbeiterInnenstrand”, opening 05/2015) and in 2016 (swimming areas "Donaufeld" and a barrier free path all around the Alte Donau).

The main activity of this task was the adaptation and renaturation of the area “Arbeiterschwimmverein” (opening 05/2015) after the ownership was transferred to the City (see action A1). After demolishing the old beach cabin buildings, the access was opened to the public (formerly only members of the "Arbeiterschwimmverein" had access) in spring 2015. It is a great success regarding popularity (voted most popular natural bathing beach in Vienna in 2016) and also concerning nature issues (quiet and renaturated zones). Access for wheelchairs via ramp is possible.

Permanent public toilets and wooden benches and tables have been installed for use by visitors, and the rest has been left in its natural state. Stands of old trees and the reed beds along the lakeshore have been largely preserved and expanded. Over 60 new trees of habitat-appropriate species such as poplars, willows and limes have been planted.

Deconstruction work at ArbeiterInnenstrand

Being the former eroding bank of the River Danube, the stretch of lakeshore between Drygalskiweg and Mühlschüttelgasse on the upper section of the Alte Donau features steep embankments and is therefore not very well suited for bathing. In July 2016, 20 new grassy terraces with wooden backrests were installed to create level relaxation bays for visitors. Six flights of steps down to the water were refurbished and additional benches installed.


Grassy terraces at Mühlschüttel

To improve access to the Alte Donau for people with limited mobility (wheel chairs), the barrier-free sections of footpath have been extended. E.g. the approx. 450-metre footpath along the Kaiserwasser arm is now barrier-free (the surface was developed and reinforced) and steps on the lakeshore promenade have been replaced by ramps. The task was finished in 2016. The nearby bridge will be renewed by another project.

Revegetation of seawall

In summer 2015, a new signage system (linked to action D2) was installed on the roads and paths around the lake to help visitors find their way around. Each of the 20 wayside information pillars indicates the current location and has a map showing the way to the nearest restaurant, dog zone, public toilets and other facilities. The info boards and points provide QR codes for information via smartphones.

Note: Additionally, after the City of Vienna could acquire another area named "Strombucht", a further stretch of bank could be re-naturated. Only the renaturation work at this site was realised within the LIFE project, not the prior demolition and infrastructure works.

Action C: Impact monitoring

Foreseen actions in the Grant Agreement
C1: Monitoring of effects
C2: Socio-economic study

Description of the state of play of this action:

Finished.

C1) Monitoring of effects of the project (in addition to already existing monitoring) comprised the following aspects:

- Biomass (sonar, GPS) [effects of B3]
- Macrophytes: mapping incl. diversity [B3].
- Beaver and trees [B3]
- Biotope types [B3]
- Woody plants [B3]
- Protected plants [B3]
- Fish [B3 and B6]
- Water quality [B4]
- Macro-invertebrates [B3 and B6]
- Amphibians [B3 and B6]
- Monitoring of the impact of the biological filter bed (soil filter)

A sensible approach for assessing the effects of measures on the aquatic environment is to sample the environment both before and after the measures were implemented. To improve sensitivity, samples may be taken at a control site as well as at restored sites. Therefore, a

"Before-After / Control-Impact" monitoring design was implemented as far as possible for the biological monitoring of renaturation measures, i.e. not only examining the project site before and after the implementation but also a suitable reference site to consider general trends.

Results of the monitoring were as follows:

- The project successfully increased the resilience of the Alte Donau against effects of climate change e.g. increase of water temperature and effects from other anthropogenic pressures. The currently good environmental status and bathing water quality could be secured within the project duration (i.e. quantitative change of water parameters was zero or positive), despite extremely warm winters and summers.
- Diversity of the macrophytes increased by number of species: The number of submerged plants has increased from 14 species to 26, the number of red listed and protected species from 10 to 19 species. One FFH-species new to the area has established itself (*Helosciadium repens*, creeping marshwort). In total 79 aquatic and semi-aquatic species currently occur at the Alte Donau.
- Biomass of underwater plants (macrophytes) increased to more than 600t (foreseen were at least 300t) of dry matter. However, this large increase is mainly caused by a general trend – most likely favoured by rising temperatures and other unknown effects.
- The area of macrophytes of originally 75% of the entire lake area at the beginning of the project has increased well beyond the foreseen 80%.
- The area of stonewort plants (Characeae) and other low-growing species has increased by more than 20.000m^2 (B3) equalling about 1,5% (versus foreseen increase to above 10%, which is a longer-term goal).
- About 650m (vs 300m foreseen) of the shore was renaturated to develop/ increase protected zones. The reed area has increased by about one third during the LIFE+ project period, from a reed covered bank length of 6.124m to 8.021m. The newly created habitats are already populated by juvenile fish and amphibians with considerable growing effect expected for the next years.


catfish / ring snake

- The benthic invertebrates at restoration sites showed that increasing habitat diversity increased also species diversity. The species assemblage approaches the reference state.
- The pre-monitoring of amphibians and reptiles showed only very few species. Although small ponds were built during the LIFE-project, the number of species could not be increased up to now.

- Integrative beaver and tree management. Beaver territories remained constant (3), while the number of beaver is slightly fluctuating from year to year.
- In total 245 trees were newly planted and the area of neophytes was removed from 14,8% to 10,1%. It is not possible to further decrease the area of neophytes due to the very strict Vienna law to protect trees beyond a certain stem diameter regardless of its origin.
- The efficiency of the mowing could not be investigated in 2015 and 2016 as initially foreseen, as selective mowing in small designated areas was meaningless due to excessive macrophyte growth. Therefore, the strategy was adapted and in 2017 – despite excessive growth – the increase in efficiency of the GPS aided mowing could successfully be proven, i.e. the decrease of efforts (and costs) per square meter weed control. The time needed for mowing a given area could be reduced to about 50%.
- The inflow of water from the Neue Donau compensates for the water deficit in the Alte Donau. Periodically, the inflow was lower than desired (40-50 instead of 60-90 l/s). The reason might be algae growth on the filter surface. Nevertheless, since the filter was put into operation in 08/2016 about 1,7 million m^3 of water was discharged and significantly improved the water balance.
- 60 t of $CaCO_3$ were introduced with the inflowing water originating from the higher $CaCO_3$ – content in the Neue Donau. Additionally, finely ground lime added to the filter bottom releases calcium into the water. However, this effect is below expectations so far, as the macrophyte-growth has significantly increased within the project period in both waterbodies. So the $CaCO_3$-demand in the Alte Donau increased while the $CaCO_3$-content in the Neue Donau simultaneously dropped while pH-values increased. The pH-value of the water introduced from the Neue Donau has changed in the past years due to biogenic decalcification as a consequence of increasing macrophyte biomass in this water body, too. The increasing macrophyte biomass is a result of a longer period without major flood events within the past five years and probably also because of climate warming. A significant reduction of macrophytes can be expected after a larger flood event. An alternative option for increasing calcium in the discharge water is the addition of acidified $CaCO_3$ instead of finely ground limestone.
- During the monitoring period the filter in average
  - reduced 75% of cholorphyllum-a
  - physically retained 50% of fine particles and
  - chemically absorbed 25% of phosphorus

  from the incoming water.

The measurements can be followed online in the Internet, from the annual diagrams: http://www.onlinemonitoring.at/Projekte/Wasserpark/index.html down to single meter readings.

C2) Study of socio economic effects on four stakeholder groups:

Finished. The surveys were completed in 09/2017. Pre-Monitoring with interviews, frequency measuring and online questionnaire were carried out for 2014-2016. Report with results was attached to 2nd Progress Report.

The socio-economic study gathered data on user behaviour, social space and public space around the lake. A wide range of user and stakeholder groups was surveyed:

- businesses (e.g. gastronomy, leisure)
- nearby inhabitants

- swimmers and water sportsmen
- associations and institutions

Data from the public lidos were analysed and user surveys and visitor counts were carried out at various hotspots around the Alte Donau. At the same time, an online survey – aimed at the general public – was published on the website of the LIFE+ project and questionnaires were also sent to clubs and associations, schools and businesses. In addition, interviews with visitors to the Alte Donau were conducted at mobile LIFE+ info stands during the summer season. The aim of the questionnaires and interviews was to gain the satisfaction rate of people concerning the Alte Donau, so that their input and ideas can be taken into account in future actions relating to the lake. The respondents were also asked about the visibility of the LIFE+ project and how effective they thought it had been. A total of 1.023 respondents took part in the surveys.

The study started in autumn instead of summer 2013. Therefore, the analysis started shortly delayed in summer 2014. Visitor frequency data in public bathing beaches were collected in 2014 and 2016 and yearly polls were carried out at the info desks. In 2015 and 2016 thematic interviews were held with local key persons, different interest groups (businesses, associations, residents and guests) and experts and participation projects were evaluated.

In total, 689 persons responded to the first online poll and 334 to the second. Out of the many results (see deliverable C2) a mentionable finding is that the older the responders, the more positive they noted the change of leisure quality.

The impression is that the “explosion” of macrophyte growth in the project period had a dominating effect on the perception of the Alte Donau area and that beyond that the awareness of changes is quite low.

To summarise, it generally can be said that the special atmosphere of the Alte Donau with its mix of nature and wildlife, free (sun-)bathing areas and places to eat and drink is rated very highly by the respondents. People appreciate the Alte Donau as a tranquil, laid-back place, and do not want to see it further "eventified". Around 50 % of the respondents think that the lakeshore is a more pleasant place to spend time than it was before:

- People are also very satisfied with the water quality, which respondents think has improved over the past few years.
- The majority of the respondents say that the grassy areas with their large shady trees are their favourite feature of the Alte Donau.
- Accordingly, some 70% of respondents say that preserving and extending the stretches of near-natural lakeshore with free public access is very important.
- The proliferation of submerged aquatic vegetation over the past two years has been noticed, and many respondents say it poses a problem for bathers and boaters. The measures taken under the LIFE+ project to improve management of the underwater plants are therefore welcomed.
- The opening and redesign of the newly opened public areas under the LIFE+-Project and specifically the free accessibility of the meadows, the trees being planted and the renaturation of shorelines were considered very positively.
- The round table as an information and participation platform for stakeholders was very welcomed.

Action E: Management

Foreseen actions in the Grant Agreement
E1) Project management
E2) Training of project staff
E3) Networking with other LIFE- and EU-projects
E4) After LIFE Communication Plan

Description of the state of play of this action:

E1) Project management

Finished with Final report. Project manager was Mr Ofenböck, financial officer Mr. Blöschl. External support for the project management has been contracted to Mr Rohrhofer (consultant).

The internal kick off meeting took place on 18.10.2013 with a detailed definition of responsibilities and duties. Regular controlling meetings were held during the project duration as a self-evaluation of the single tasks, which displayed comprehensively the state of play. For a more detailed description of the management and a table of the 11 project management team meetings and 12 financial controlling meetings see chapter 4.1.

E2) Training of project staff

Finished in 9/2016. Five workshops took place (four workshops were foreseen).

The training for the project staff comprised topics like available technology, water management, tree inspections and maintenance, relations between hydraulics and ecology and practical use of equipment (GPS etc.)

The workshops covered tree management (08.-09.04.2014, 18 participants), nature protection aspects of trees and riparian area maintenance (23.06.2014, 12 participants), macrophyte-management (19.11.2014, 9 participants), the new soil filter (24. 5.2016 for generally interested staff with 28 participants and 2.9.2016 for employees responsible for maintenance, 14 participants). Staff also participated in regular expert workshops.

E3) Networking with other LIFE- and EU-projects

Finished. There was a regular contact to national and international LIFE projects. The project has contacted the following LIFE projects:

- There was a good contact concerning replacement of macrophytes with the CAISIE project on invasive species (LIFE07NAT/IRL/341, meanwhile closed).
- LIFE Lippe Aue (LIFE 08 NAT D 010): Contact and exchange of experiences.
- Some staff participates in LIFE-Sterlet (LIFE14NAT/AT/000057) since 11/2015.
- "My Favourite River" (LIFE09 ENV/DE/000011) in order to exchange experience but overlaps seem to be restricted.
- Nearby INF project LIFE13 INF/AT/000143 "Wirtschaft & Natur NÖ" (concerning cooperation on biodiversity events). A good contact and chances for cooperation have evolved.
- “Danube birds conservation”. During a meeting in Bratislava (01.12.2014) both LIFE-projects were presented and discussed.
- Attendance of the annual national LIFE-Platform meetings (2013 - 1017), e.g. with water related projects “Wilderness Wetland Wachau” (LIFE13 NAT/AT/000301),

"Ausseerland" (LIFE12 NAT/AT/000321), Saving Danube Sturgeons (LIFE11 INF/AT/000902), "Restoration of the Lower Morava floodplains" (LIFE10 NAT/AT/000015), "Lavant" (LIFE10 NAT/AT/000017), "River landscape development Enns" (LIFE09 NAT/AT/000224), "Gail" (LIFE08 NAT/A/000613), "Mostviertel-Wachau" (LIFE07 NAT/A/000010), "Traisen" (LIFE07 NAT/A/000012).

- The project was also presented at the LIFE Water Platform Meeting in Manchester on 25.05.2016, with the English IP being at the centre stage (sort of a kick-off meeting).
- Participation and presentation at the LIFE Platform Meeting on Climate Action in Urban Areas in Barcelona (06/2017)
- Attendance and presentation at LIFE Infoday Vienna on 12.03.2018.

E4) After LIFE Communication Plan

Finished. The activities and the integrative management around the Alte Donau will last beyond the project end and GPS supported mowing and ecological monitoring will continue as a standard task. The project will be presented to visitors on demand.

5.2. Dissemination actions

Action D: Communication and dissemination

Foreseen actions in the Grant Agreement
D1) Project website
D2) Info boards
D3) Layman's Report
D4) Media work, info material like thematic folders
D5) Local dissemination integrating interested stakeholders: info desks, beach flags, printed material, project walks, interviews, educational work in schools, innovative participation of the public.
D6) Dissemination to experts and administration

5.2.2 Dissemination: overview per activity

Description of the state of play of this action:

D1) Project website

Finished. The website is online since 31.12.2013 and was updated continuously within the project duration. It is integrated into the City of Vienna's web site and thus well connected to associated topics. The content provides an overview of the tasks and the realized measures in German, with a shorter version in English: www.life-altedonau.wien.at. The web site will be online at least until 3/2023.

The total number of visitors since project start was about 100.000.

D2) Info boards

Finished in 5/ 2014. Info boards have been set up. Mobile App is working.

The formerly existing "Wasserweg" (Water Trail) was integrated into the LIFE+ project and therefore six instead of proposed three info boards were produced and set up (see also action B7 and detailed description annexed to PR2, deliverable D02_D01_02). All info boards show

the LIFE+ logo and a short LIFE+ project description. The smartphone application (www.wiener-wasserweg.at, available for Android smart-phones and iPhone) provides on the spot information at 21 stations of the water trail. The app was downloaded 6.090 times (Android 2.150, iOS 3.940 downloads).

Furthermore, since summer 2015, 22 slim info points (guidance system Alte Donau) were installed on the roads and paths around the lake to offer information and help visitors find their way around (linked to action B7). The info boards and points provide QR codes for information on site-related information via smartphones.

Info board

D3) Layman's Report

Finished in 3/2018. Two layman's reports giving a comprehensive overview on the main topics of the LIFE+-project were published. The first and less comprehensive German edition was completed in February 2016 2.000 copies). The second and more detailed version was finished in 3/2018 and was also published in English (1.000 copies in German, 400 copies in English).

D4) Media work, info material like thematic folders

The task was finished in 3/2018 with the end of the project and comprised the following publications:

Special media

- The first three info folders (May 2014, 5000 copies) cover the "LIFE Project" (main folder incl. waters management), "History and Utilisation" and "Fauna and Flora".
- A LIFE+ project video clip was finalised in 08/2016. It is available on the website (direct link: www.wien.gv.at/video/1079/EU-Projekt-LIFE-Alte-Donau).
- A second video clip was finalized in 3/2018 available on the project website (direct link: https://www.wien.gv.at/video/1615/Gemeinsam-fuer-die-Alte-Donau)
- A short video clip commissioned by EU representatives in Austria is available on the corresponding web-site (http://ec.europa.eu/avservices/video/player.cfm?ref=I094932&sitelang=en).
- Radio broadcast ORF: "Characeae planting in the Alte Donau", 06.06.2017 within "Wien heute"

Press work:

- About 100 press releases
- 20 press releases via „Rathauskorrespondenz" of the City of Vienna
- The annual newspaper of MA 45 "Wiener Gewässer" (1.000 copies) had a focus on the LIFE-Project in July 2014.
- 20 documented reports in Austrian print media, radio and TV.

Info folders

D5) Local dissemination integrating interested stakeholders: info desks, beach flags, printed material, project walks, interviews, educational work in schools, innovative participation of the public.

Finished (3/2108).

- Two beach flags and one banner for the info desks in 2014.
- 10.000 inflatable swimming aids with LIFE logo as giveaways
- 3.000 Card games "Alte Donau MEMO" (2016)
- 4.000 LIFE+-branded water balls (2016)
- A LIFE+ branded transportation e-bike of the beneficiary (MA 45) was acquired in summer 2014. It can be easily converted into a mobile info desk.

Specific LIFE+ events:

- LIFE+ project event at the occasion of „Daughters' day Vienna", 24.04.2014
- 15 environmental education events in 2014 together with the association "Umweltspürnasen" like workshops and guided walks for families, schools and kindergartens.
- Four workshops at four primary schools.
- Special guided walks Alte Donau with external experts. Seven guided tours (3 by boat) with external experts and different topics (30.08.2014, 06.09.2014, 06.06.2015, 05.09.2015, 16.07.2016 and 23.07.2016)
- Opening festivity (two days) for the "ArbeiterInnenstrand", 9./10.05.2015
- LIFE+ info desks at 5 large events in Vienna, like the large "Donauinselfest" (27.06.2014, about 3,1 million visitors), "Biodiversity Day" (2014 and 2015 at Alte Donau), "Danube Day"
- About 5,000 counted visitors at "Inselinfo" (visitor centre of MA 45)

D6) Dissemination to experts and administration

Finished with final report.

- National expert workshops (21.11.2013, 09.04.2014, 19.03.2015 and 16.04.2016)
- Presentation at annual congregation of fishermen at Alte Donau (13.11.2013, 12.11.2014, 15.4.2015, 13.4.2016, 12.4.2017),
- Presentation at World Lake Conference in Perugia (09/2014),
- Networking with other cities with similar lake structures, mainly from Eastern Europe (cross-border workshop, 16.-17.06.2015),
- Presentation during annual LIFE-platform meetings (2013 - 2017)

- Presentation at LIFE info day 2015, and in the chief executive office for municipal authorities in Vienna, 12.11.2014
- Presentation in Munich: Meeting “Gewässer in der Stadt”, by Living Rivers Foundation and Werkbund, 08.10.2015.
- Participation and project presentation at European Environmental Forum, Bristol, 07.-09.10.2015
- Presentation/ exchange with administrations of other European cities "Unity in Diversity" (11/2015)
- Presentation + excursion for Ethiopian delegation (administration and university), 26.04.2016
- Presentation + excursion for municipal departments in Vienna, 13.06.2016 and 29.06.2016
- Presentation + excursion for students of University of Life Sciences, Vienna, 6.6.2016
- Participation and project presentation at LIFE Water Platform Meeting in Manchester, 24./25.05.2016
- Contact and exchange of experiences with Ruhrverband (Essen) on macrophyte-management
- Presentation for members of the Hungarian Academy of Sciences (22.4.2016)
- Presentation in Budapest (City Administration) and discussion of a common LIFE proposal, 07/2016.
- 4 Project related presentations at international DGL/SIL congress (26.-30.09.2016)
- Excursion to project during international DGL/SIL congress (30.09.2016)
- Participation at Working Group Water / Eurocities European Environmental Forum: Ljubljana (19.10.2016) and Antwerp (15.-16.3. 2017)
- Project presentation for stakeholders and administration in Ljubljana (01/2017)
- Participation/ presentation in Hamburg at "Alster Forum" (08.-09.06.2017)
- Excursion with the Department of Human Geography and a group of students from Stockholm University and support of the work for a scientific paper, (09.05.2017)
- Presentation at the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management during “Writers Workshop” 26.06.2017
- Attendance and presentation at LIFE Infoday Vienna on 12.03.2018.
- Finale conference: The final event (conference) was held on 17. and 18.05.2018 (second day with excursion), after the project end, as there is not much vegetation to see before April. The technical desk officer agreed to this change during Inventory Meeting on 08.11.2017. He also attended the event and gave an introductory speech. About 90 participants.

The **LIFE+-Logo** was used for all dissemination materials and equipment:

- Website
- Info-folders
- Layman’s reports
- All info boards
- Videos
- Powerpoint presentations
- Steles (guidance systems)
- Supervision boat
- Info-bike
- Mowing equipment (notebooks, GPS; software)

- Fish protection equipment
- Soil filter control system
- All reports

Mailing lists

For dissemination and invitations to project related events different mailing lists – depending on the topics – were used. The lists included relevant stakeholders, politicians, businesses, associations and clubs, other departments of the administration in Vienna, ministries, international contacts of the City of Vienna, universities, related national and international LIFE-projects and all participants of the national LIFE-platform.

For press releases the "Rathauskorrespondenz", which is the official press agency of the City of Vienna and the second largest press agency in Austria, was used.

Social Media

Concerning social media, the official Facebook – account of the MA 45 "Donauinsel" (https://de-de.facebook.com/Donauinsel/) was used for promoting the project and to disseminate current information.

5.3. Deliverables

Deliverable	Due date	Done	Submitted/ comments
E1: Detail budget plan and schedule	15.08.2013	18.10.2013	presented on kick-off meeting and MoT visit, 18.10.2013
B1: Integrative water management plan, draft	12.12.2013	30.04.2014	Annexed to MtR. Inspected during visits on 26.11.2014 and 27.3.2015 (with TDO).
B4: Plan of soil filter project	31.01.2014	05.12.2014	Submitted to authority. Annexed to MtR.
A3: Plan of weir project "Hebergraben" a) Construction b) Remote control	 30.06.2014 30.06.2015	 31.10.2014 12/2014	Remote control installed at inflow (at the soil filter instead of outflow) in 2016. Annexed to MtR.
B2: Risk management plan, draft	12.08.2014	31.07.2014	Annexed to MtR. Inspected during visit on 27.3.2015 (with TDO).
A2: Plan of "leisure quality" project	30.09.2014	08/2015	Additional report (Donaufeld) in 2015 Annexed to 1st Progress Report 2016
A1: Plan of "protected zones" project	30.09.2014	31.12.2014 revised on 30.05.2015	As new options turned up, a revised version was compiled. Annexed to MtR.
B3: Plan on "biodiversity measures"	28.11.2014	03/2015	Annexed to MtR.
B3: Management plan "beaver and trees"	28.11.2014	06/2015	Annexed to MtR.
B4: Operating manual soil filter	31.03.2015	12/2016	Annexed to 2nd Progress Report 2017

Deliverable	Due date	Done	Submitted/ comments
C1: Monitoring report 2013 - 2014	29.05.2015	30.04.2015	Annexed to MtR
B5: Operating manual weir "Hebergraben" a) Manual operation b) Remote control	 30.06.2015 31.03.2016 10/2016	 31.10.2014 08/2016	Annexed to MtR. Remote control and manual see realised within Action B.4
D3: Layman's report, version 1 (DE)	30.09.2015	02/2016	Annexed to 1st Progress Report 2016
E2: Documentation of staff training	16.05.2016	09/2016	Annexed to 1st Progress Report 2016
C1: Monitoring report 2015	31.05.2016	09/2016	Annexed to 1st Progress Report 2016
B1: Integrative water management plan – final version	30.11.2017	11/2017/	Annexed to Final Report
B2: Risk management plan - final version	30.11.2017	11/2017/	Annexed to Final Report
D2: Documentation info boards	31.03.2017	09/2017	Annexed to 2nd Progress Report 2017
D3: Layman's report (final version, DE/EN)	30.11.2017	03/2018	Deadline changed due to project extension
D4: Report on media work	30.11.2017	03/2018	Annexed to Final Report
D5: Report on info desks and participation	31.03.2017	09/2017	Annexed to 2nd Progress Report 2017
E3: Documentation of networking	28.04.2017	09/2017	Annexed to 2nd Progress Report 2017
C2: Study: Evaluation of socio-economic effects	28.04.2017	11/2017	Annexed to 2nd Progress Report 2017
C1: Monitoring report 2016 - 2017	28.02.2018	12/2017	Annexed to Final Report (partly to 2nd Progress Report)
E4: After LIFE Communication Plan	31.05.2017	03/2018	Annexed to 2nd Progress Report

5.4. Milestones

Milestone	Due	Achieved	Comments
E1: Begin of Project	01.07.2013	16.09.2013	Project was granted in 08/2013.
E1: Set up of project steering team MA45	24.07.2013	16.09.2013	Project was granted in 08/2013.
D6: Kick-off workshop	12.09.2013	18.10.2013	
B4: Contracting of soil filter planning	30.09.2013	01.09.2014	
A3: Contracting of planning of weir	09.10.2013	23.07.2014	

Milestone	Due	Achieved	Comments
Hebergraben			
B3: Contracting of Biocoenosis management	31.10.2013	16.04.2014	
D1: Website online	31.12.2013	31.12.2013	Website was contracted in 09/2013, online on 31.12.2013
B1: Start of integrative water management	31.01.2014	31.05.2014	
D2: LIFE info boards set up	30.04.2014	02.06.2014	
D5: Presentation during "Day of biodiversity": In 2014 at biosphere park Wienerwald, in 2015 event was on-site at "Urban Lake".	(22.06.2014) 22.06.2015	13./14. 06.2014 05./06. 06.2015	
E3: LIFE networking workshops	11.09.2014	6/2017	Documentation annexed to 2nd Progress Report
B2: Start of risk management implementation	18.11.2014	01/2015	
D6: Dissemination workshop, technical experts and City administrations	26.03.2015	16.-17. 06.2015	
B6: Inauguration pilot project 1: protected zones	31.03.2015	27.05.2015	
B7: Inauguration pilot project 1: improved leisure use	31.03.2015	09.05.2015	
B5: Start of operation of weir "Hebergraben"	31.03.2015	28.11.2014	
B3: Start-up of macrophyte supervision system	30.04.2015	08.04.2014	
D5: Inauguration of info desks	30.07.2015	30.08.2014	
D6: Cross border workshop + LIFE networking workshop	15.09.2015	16.-17. 06.2015	
D4: Press conference	16.09.2015	27.05.2015	Cruise on Alte Donau
B4: Start of operation of soil filter	15.03.2016	08/2016	
D5: Event "Bird Race"	28.07.2016	-	Cancelled due to lack of interest by organiser Bird Life. Area was classified as not suitable for this event (too few species for the area)
B7: Inauguration pilot project 2: improved leisure use	31.08.2016	07/2016	
D6: Dissemination workshop, technical experts and City administrations	06.10.2016	-	The workshop was foreseen in the proposal but cancelled as the target audience was more or less the same as for the final event. For compensation the final event

Milestone	Due	Achieved	Comments
			was extended (one day presentations, another day field trip)
D6: Final event	16.03.2018	17.5.-18.5.2018	Postponed to period after the project end in order to allow a field trip on second day
D4: Press conference	16.03.2018	18.4.2018	Cruise on Alte Donau
E1: Project end	31.03.2018	31.3.2018	

5.5. Evaluation of Project Implementation

In general, the measures were successfully implemented according to schedule. An evaluation on the methods, results and cost efficiency per task is given in the following table:

Task	Foreseen in the revised proposal	Achieved	Evaluation
Preparatory actions			
A1: Planning of renaturation	Transfer of administrative power over the areas and detailed planning of renaturation of river banks and protected zones.	Implemented as planned.	The transfer of administrative responsibility appeared to be more difficult than expected as the property relationships around the Alte Donau are quite complicated. Nevertheless, all necessary transfers could be realized as required.
A2: Planning of leisure value measures	Transfer of administrative power, detailed planning of the leisure value improvement.	Implemented as planned.	All necessary transfers could be realized as required. Most important outcome was the transfer of the area for the "ArbeiterInnenstrand".
A3: Planning of weir "Hebergraben"	Planning documents, tendering of equipment for weir "Hebergraben"	Planning of modernisation was carried.	Required plans for the modernisation of the weir were finished in time without any problems. The Installation of the remote control was realized at the inflow weir at the soil filter (B4), in order to have better operating security.
A4: Other permits	Optional task if additional permits were necessary.	One nature conservation permit, one traffic permit	A nature conservation permit for the soil filter and a traffic permit for the time of construction were necessary. Permission documents were prepared and the permission was issued in time.
Implementation actions			
B1: Water management plan B2: Risk management plan	Development of an integrative water management and risk management plan Alte Donau	Task Implemented as planned	Plans were designed in a draft version at an early stage of the project and permanently updated and implemented within the project duration. In the course of the development of the plans, the complexity of the system emerged and also that much more discussion was needed than initially thought. The post evaluation reflects the positive effects of the project quite well. The management plans will provide a valuable tool for future management

Task	Foreseen in the revised proposal	Achieved	Evaluation
			decisions and evaluations. In the long run it is expected that an early recognition of upcoming problems will help to counteract to undesirable trends at an early stage and to save costs in future.
B3: Biocoenosis management	a) Plan to enhance resilience of macrophytes b) Prototype equipment for 3 mowing boats c) Purchase of a new supervision boat d) Fostering of suitable vegetation (low-growing macrophytes) e) Tree rejuvenation and neophytes removal f) Integrative beaver / tree management	a) Implemented as planned b) Implemented as planned c) Implemented as planned d) Over 200 juvenile trees were planted and invasive plants were removed Chicken wire was used to protect valuable trees. Willows and poplars were planted as winter diet for beaver in the future	Measures concerning the aquatic environment according to the plan are showing first positive results, e.g. planting of low-growing macrophytes. Despite the very good development of the planted species, only a relatively small area of the Alte Donau is currently overgrown with low-growing macrophyte population. Since the method works very well in principle, it can and should be extended to other areas in the future. A supervision boat was acquired in 2014 and is very useful for maintenance work. The rejuvenation of trees to secure the location-typical tree vegetation for the future was implemented as planned. The control of invasive plants turned out to very time (and cost) consuming and difficult as some species reappear every year. The beaver management seems to be successful so far as the beaver population was constant over the project duration. Upgrading weed harvesters with GPS-Systems made mowing management much more efficient and essentially contributes to the aquatic environmental management. The cost per area could be significantly reduced. In addition, the planning and control of mowing is remarkably facilitated by using the newly developed and innovative mowing software. However, the mowing strategy in terms of spatial division of mowing areas has to be adapted to current circumstances.
B4: Water balancing upper Alte Donau	Construction of a biological soil filter bed to compensate for the water and calcium deficit in the Alte Donau and to reduce nutrients and fine particles in the discharged water	Implemented at the Wasserpark area as foreseen with the possibility of injecting lime milk to the filter bottom.	The construction of the soil filter was delayed (budgetary agreement delayed due to state elections). The construction work was carried out quickly and was finalized within four month (July 2016). Pre-tests of filter material in the laboratory were inserted in order to save space and money with an optimized material. Nevertheless, the costs for planning and construction clearly extended the expected expenses. However, the filter is a prototype and there were no empirical values available. Furthermore, a sophisticated solution, which allows 5 different operating modes, was realized. In order to enhance the water quality in the Alte Donau, the filter was designed to biologically degrade organic material, retain fine particles, to chemically absorb phosphorus and it enables injecting lime milk into the bottom of the filter.

Task	Foreseen in the revised proposal	Achieved	Evaluation
			Up to now the reduction of organic material and nutrients works well while the measurable effect of the injected calcium carbonate is below expectations up to now. An additional water supply to balance the water deficit in the Alte Donau is guaranteed for the future.
B5: Water distribution lower Alte Donau / "Obere Lobau"	Modernisation of the weir Installation of remote control	Modernisation of the weir was carried out as planned. Remote control was shifted to the inflow (B4).	The weir was modernized as a measure weir. The remote control for discharge control was shifted to the inflow weir as at the Hebergraben (outflow) flotsam frequently would impair the function. Cost were lower than expected as remote control was shifted to B4
B6: Renaturation measures	Three pilot projects to replace 300 m solid built bank with renaturated bank	Implemented as planned	Due to the fact that the ownership of the bank is still quite fractionated it was difficult to find suitable patches. Finally, feasible plots for renaturation were identified and measures were finished 2016. Replacement plantings were necessary in some spot due to highly intensive use. Since then, the vegetation develops satisfactorily.
B7: Leisure value measures	Improve uses for recreation Improve barrier-free accessibility Promotion of cyclists and pedestrians The task was finished in 2016. The nearby bridge will be renewed by another project.	Task Implemented as planned	Measures to develop recreation areas (B7) were realized with the takeover of shore properties by the City of Vienna with a simultaneous implementation of a “close-to-nature” landscape design. Especially the adaptation and renaturation of the formerly private area as a public recreation area (ArbeiterInnenstrand) worked without major problems. Now it’s one of the most popular sites at the Alte Donau. The grassy terraces with wooden backrests which were installed along the stretch of lakeshore between Drygalskiweg and Mühlschüttelgasse were realised as foreseen and are very popular and intensively used by visitors. The new signage system (linked to action D2) around the lake helps visitors find their way around. The extension of barrier-free sections by about 450m and the replacement of stair by ramps improved the access to the Alte Donau for people with limited mobility (wheel chairs).
Impact monitoring			
C1: Monitoring of effects	- Biomass - Macrophytes - Beaver and trees - Biotope types - Woody plants - Protected plants - Fish - Water quality - Macro-invertebrates - Amphibians - Monitoring of the impact of the	Successfully implemented as planned	The methods applied were standard methods whose functionality is proven. As mostly biological monitoring was carried out it is obvious that success or failure of a measure cannot always be evaluated immediately. The effects of some measures can only be assessed over a longer period of time. The resilience of the Alte Donau against effects of climate change was increased and the good status could be secured within the project duration. The diversity of the macrophytes increased by number of species, the biomass of underwater plants

Task	Foreseen in the revised proposal	Achieved	Evaluation
	biological filter bed (soil filter)		(macrophytes) increased to more than 600t (at least 300t were intended) and the area of macrophytes of originally 75% increased beyond the foreseen 80%. The area of stonewort plants (Characeae) and other low-growing species has increased by more than 20.000m^2 equalling about 1,5%. About 650m (vs 300m foreseen) of the shore were renaturated to develop/ increase protected zones and the reed area has increased by about one third during the LIFE project period. 245 trees were newly planted and neophytes were removed from 14,8 to 10,1%. Beaver territories remained constant. The increase in efficiency of the GPS aided mowing could successfully be proven, in particular the decrease of efforts and costs per square meter weed control. For the monitoring of the soil filter the amendment to the grant agreement (prolongation) was essential. The inflow of water from the Neue Donau is permanently measured and compensates for the water deficit in the Alte Donau (about 1,7 million m^3 of water nutrient-poor water was discharged). Periodically, the inflow was lower than desired (40-50 instead of 60-90l/s), countermeasures were taken. Measuring probes were installed for continuous measure of chemical and physical measurements. 60t of $CaCO_3$ were introduced with the inflowing water. However, this effect is below expectations so far, as the macrophyte-growth increased and $CaCO_3$ – content decreased significantly in both waterbodies. The costs for monitoring were higher than expected more sampling sites and sampling dates were necessary.
C2: Socio-economic study	Evaluation of existing data and data collected during the project - Frequency survey on baths on the Old Danube - Evaluation of the questionnaire campaign - Thematic Guided Interviews with Local Key Persons and Experts - Evaluation of the participation projects	Implemented as planned.	Data from the public lidos were analysed, among others, and user surveys and visitor counts were carried out at various hotspots around the Alte Donau. At the same time, an online survey aimed at the general public was published on the website of the LIFE+ project and questionnaires were also sent out to clubs and associations, schools and businesses. Participation in the online survey was satisfactory but it is obvious that it is selective to some degree. Therefore, in addition, interviews with visitors to the Alte Donau were conducted at mobile LIFE info stands during the summer season. The aim of the questionnaires and interviews was to gain an insight into how satisfied people are with the Alte Donau, so that their input and ideas can be taken into account in future measures relating to the lake.

Task	Foreseen in the revised proposal	Achieved	Evaluation
			The results show that people appreciate the Alte Donau very much as a quiet, laid-back place, and do not want to see it further "eventified". In particular it turned out that people support and embrace the measures taken during the LIFE-project. Especially re-naturation of banks, near natural recreation areas, measures to support water quality and participation of citizens were considered very positively.
Dissemination			
D1: Project website	German/English website offering general information about the project and current measures	Implemented as planned.	Website was successful in terms of user numbers: In total about 100.000 people visited the website (98.339 visted the german, 2.130 the english website) which equals about 2.100 visitors / month.
D2: Info boards	Installation of three info-boards at high traffic areas	Six info boards were installed	A “Water Trail” was integrated into the LIFE+ project and therefore six instead of proposed three info boards were produced. A smart phone app which provides information about the Alte Donau was developed. The app was downloaded about 6.000 times up to 3/2018. As this was not foreseen in the proposal the costs were fully covered by the beneficiary.
D3: Layman's Report	Two layman’s reports	Implemented as planned.	The first and smaller German edition was completed in February 2016. The second and more detailed version was finished in 3/2018 and printed also in an English version. Reports were widely distributed and the feedback was good.
D4: Media work, info material	Publishing of folders and short film-clips	Implemented as planned.	Three info folders (about LIFE-project, nature, recreation) were produced and distributed. Most popular was the folder about recreation. Videos were published on the website.
D5: Local dissemination integrating interested stakeholders	Several events, workshops, guided walks, biodiversity day, bird race, info tables, give-aways	Implemented as planned except bird race.	For dissemination many events were organized or visited and a large number of citizens and stakeholders were reached. Very important and successful was the installation of a round table as information platform for stakeholders.
D6: Dissemination to experts and administration	Integration and of experts and distribution of knowledge about the project and its results.	Implemented as planned.	The project was presented nationally and internationally during a wide variety of conferences, events and excursions. Unfortunately, there were nearly no international participants at final conference.
Management			
E1: Project management	Project management according to the internal guidelines of the City of Vienna	Implemented as planned.	The internal project management is proved and tested since years and fulfilled the requirements of the project very well.
E2: Training of project staff	Four workshops were planned.	Five workshops were held.	Continuing education and training is very appreciated within the administration of Vienna and workshops with topics related to the project area were well received.

Task	Foreseen in the revised proposal	Achieved	Evaluation
E3: Networking	Networking with other LIFE-projects	Implemented as planned	A number of LIFE-projects were contacted but it was a little bit difficult to find LIFE-projects in cities with similar or related situations. The national LIFE-platform was visited regularly and two international LIFE-platforms were visited (Manchester and Barcelona).
E4: After LIFE Communication	Compilation of an after LIFE-Communication plan	Implemented as planned	A plan was compiled to sketch possible activities in the project area beyond the project end as far as possible from today's point of view. The integrative management will be continued.

5.6. Analysis of long-term benefits

1. Environmental benefits

   a. Direct / quantitative environmental benefits:

In general, the project helps to reduce the vulnerability of urban lakes and its ecosystems for negative impacts of climate change effects and anthropogenic influences. The integrative lake management Alte Donau forces a sustainable development, use and monitoring of the lake and its surroundings; ecological, economic and socio-economic targets included and balanced.
The currently good environmental status and bathing water quality could be secured, despite extremely warm winters and summers, i.e. quantitative change of water parameters was zero or positive. Therefore, the project successfully has reduced the vulnerability of the "Alte Donau" from effects of climate change e.g. increase of water temperature and effects from other anthropogenic pressures. This is - compared to algae blooms and breakdowns of the water parameters in comparable years of the past - an increase in resilience.
Actions developed and implemented have been proofed to be ecological, economic and socio-economic valuable and help to reduce climate change effects. The resulting benefits are listed below:

Action B3 (Biocoenosis management):

As the GPS-supported mowing is much more effective (less time and fuel is needed per area), it contributes to save energy resources and emissions. At the same time, the protection of the fish population has increased as a result to new applied technologies.
The biodiversity has increased by planting Characeae (which grew in the Alte Donau in former times).
Trees, especially less aged trees and new planted trees, could be saved from beavers by establishing a beaver management (protecting nets) which also leads to a higher percentage of tree population and therefore more CO_2-uptake.
Additionally, the area of invasive neophytes was reduced which endanger domestic vegetation.
The diversity of the macrophytes increased by number of species: The number of submerged plants has increased from 14 species to 26, the number of red listed and protected species from 10 to 19 species. One FFH-species new to the area has established itself (*Helosciadium repens*, creeping marshwort). In total 79 aquatic and semi-aquatic species currently occur at the Old Danube.
Biomass of underwater plants (macrophytes) increased to more than 600 t (foreseen at least 300 t) of dry matter. This large increase however is also due to warm

weather.
The area of macrophytes of 75% has increased well beyond the foreseen 80%. The area of stonewort plants (Characeae) and other low-growing species has increased by more than 20.000 m2 (B3) equalling about 1,5% (versus foreseen increase to above 10%, which is a longer-term goal).
Beaver lodges remained constant (3), the number of beavers is fluctuating from year to year. In total 245 trees were newly planted and neophytes were removed from 14,8 to 10,1 %. It is not possible to decrease the neophytes further due to the very strict Vienna law to protect trees beyond a certain stem diameter (regardsless of its origin).

Action B4 Water balancing upper Alte Donau and B.5 Water distribution lower Alte Donau.

The soil filter and the weir bridge "Hebergraben" help to ensure a constant good water quality and quantity in the Alte Donau (filter system, control possibility for water entering and leaving the system).
The innovative soil filter performs the following tasks (so far about 1,7 million m^3 water throughput):

- it supports a bio-film to biologically degrade organic material (measured effect: e.g. cholorphyllum-a decrease by 75%)
- it physically retains fine particles (50%)
- it chemically absorbs phosphorus (25%)
- it actively increases the calcium content by injecting lime milk to the filter (however, lesser than expected).

Action B6 Renaturation measures

The project also contributes to climate adaptation by fostering green infrastructure (near natural areas) and increasing the resistance and resilience of the lake against warming. Natural or semi-natural habitats are important habitats for endangered species and support biodiversity. Protected areas for have been established.
About 650 m (vs 300 m foreseen) of the shore were renaturated to develop/ increase protected zones. The reed area has increased by about one third during the LIFE project period, from a reed covered bank length of 6.124 m to 8.021 m. The newly created habitats are already populated by juvenile fish and amphibians with considerable growing effect expected for the next years.

Action B.7 Leisure value measures

Another aspect is the preservation of the attractiveness of the Alte Donau as a local recreation area. Citizens are also very satisfied with the water quality, which respondents think has improved over the past few years. People only need to overcome short distances to reach an attractive recreation area. This leads to less fuel consumption and rather the use of public transports or bicycles. The opening and redesign of the newly opened public areas under the LIFE+-Project and specifically the free accessibility of the meadows, the trees being planted and the renaturation of shorelines were considered very positively.

b. Relevance for environmentally significant issues or policy areas

The integrated lake management supports the attainment of the objectives of the European Water Framework Directive 2000/60/EG (EU Water Framework Directive) Directive 2006/7/EG (15.02.2006) and the European Bathing Water Quality Directive 92/43/EWG (21.05.1992) by increasing and stabilizing a good ecological status and securing good bathing water quality. The measures to

increases the local biodiversity support protected species and adds to the Habitats Directive 92/43/EWG. Finally, the invasive alien species control supports the goals of EU Regulation on Invasive Alien Species (1143/2014). The Vienna nature conservation regulation (Wiener Naturschutzverordnung NschVO) covers wild fauna and flora and contains the denomination of biotope types used in this project.

The integrative water management plan (B.1) and the risk management plan (B.2) can be used for uptake and dissemination in other EU cities with similar problems and contributes to further development of water management practice. Further, the prototype soil filter (B.4) can be applied elsewhere. The projects contributes to the Urban Environment: Decision 1411/2001/EG (27.06.2001) on cooperation in the field of sustainable urban development "best practice" measures concerning integrative water management of urban surface waters.

2. Long-term benefits and sustainability

a. Long-term / qualitative environmental benefits

The prototype soil filter as well as the safeguarding of near-natural areas will have a long-term effect. Experience with the soil filter provides valuable information for similar filter types in the future for other applications and in other cities.
The soil filter and water balancing actions help to ensure a good water quality and quantity in the long-term. Further effects are also included in section 1 (direct benefits) which can be also seen as long-term benefits.

b. Long-term / qualitative economic benefits

In general, the successful implementation of the management plans will save costs in the long run as problems will be recognized earlier and counteractions can be implemented at an early stage if problems occur.
The integrative lake management plan ensures a systematic approach for taking into account all components of the system. The developed decision support system (DSS) helps to determine future actions by considering all possible negative and positive effects before implementing the action (iterative process for action optimization). The DSS will be applied for all future projects.
The risk management plan ensures to reduce the overall risk in the long-term. All possible risks have been identified and analysed and actions to minimize these risks have been established.
The establishment of an effective biocoenosis, water balancing, water distribution and users' management saves costs and resources resulting from the upgrade of operational management for maintenance and care of the Alte Donau and its surroundings.

c. Long-term / qualitative social benefits

The project contributes to the socio-economic value of the area by safeguarding one of the most popular recreation areas in Vienna and by securing and creating businesses and jobs. It also improves the quality of life for the Viennese citizens and has a positive climatic effect for the immediate neighbourhood.
The project has improved the leisure quality of the area around the Old Danube while at the same time also improving the environmental aspects. E.g. the newly renovated Arbeiterstrand is now accessible to the public and has already advanced to be the most popular natural beach in Vienna. At the same time, the project has installed protected zones, which are widely accepted by the visitors. Also the

problems with dogs are kept at bay with a special, fenced area for dogs at the Old Danube.
Although no quantitative figures exist, the higher leisure fosters the number of jobs in the businesses around the Old Danube (restaurants, boat and sport services etc.).
An innovative and up-to-date holistic view of the water resource, ecologic and socio-economic environment will allow an improved selection of counter-measures in times of high pressure, draught, heat waves etc., i.e. unforeseen impacts of such measures to a large part can be spotted in advance and thus be avoided. Due to the elaborate integrative water management plan and the risk management plan such measures can be evaluated much more rapidly and lead to better cost-effectiveness.
The GPS and sonar based mowing of water weeds increases efficiency and will be more cost effective than before the LIFE project. The intention was to select small patches of macrophytes and mow them more precisely. However, in 2015 and 2016 the mowing boats had to operate six days a week all over the lake to cope with the extreme macrophyte growth. In 2017 the plan was adapted and - while again mowing the whole lake - the effort per area was measured and the higher efficiency of the GPS support proven. This part of the project may have a certain bankability potential.
Users, visitors and citizens from all over Vienna could be reached by the project. Improved communication between administration, citizens and stakeholders (D1-D6, especially the regular “Round Table”) is an important part of the further development of the "Alte Donau" and probably prevents costly planning and decision failures. The LIFE project has gained high interest in the integrated water management by other departments.

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

The continuation of the measures is ensured, as the CB (City of Vienna) is the owner of the sites and therefore has a vital interest in sustainability of the achievements. The project measures are either lasting a long time or will be repeated periodically over a long time. Therefore, the experience from the innovative measures (especially the soil filter) will also be available for other cities or water bodies for a long time.
Also, most of the above stated environmental and socio-economic benefits are long-term, sustainable and probably even increasing effects, e.g. for the characeae, reed and newly planted trees, which need time to increase and grow, and biodiversity, which also takes years to fill the new niches.
Additionally, the risk management plan and the water management plan represent an innovative and up-to-date holistic view of the water resources and the ecologic and socio-economic environment. It allows an improved selection of counter-measures in times of high pressure, draught, heat waves etc., i.e. unforeseen impacts of such measures to a large part can be spotted in advance and thus be avoided. With the elaborated integrative water management plan and the risk management plan such measures can be evaluated much more rapidly and lead to better cost-effectiveness.
The integrative lake management of the Alte Donau will be implemented as a permanent task in the MA45. Especially, the implementation of the management plans, renaturation measures as well as participation of stakeholders (“round table”) will be continued after the life project.
The plans (B.1, B.2) will be updated and adopted regularly to changing conditions (e.g. climate change, urban development, users’ behaviour, groundwater

development, biocoenosis development as well as political decisions and developments).
To further ensure the good water quality and quantity most of the actions will be continued, especially the mowing management (B.3), soil filter (B.4) and weir (B.5.) – to be adopted on water quality and water level developments, maintenance and care of the protected zones and renaturated areas (B.5) as well as further measures to improve the use (B.7).
Monitoring will be continued in a reduced (but efficient) way.
Communication, information and dissemination activities will be continued by visiting events. The participation of the population and other stakeholders is an important part of the further development of the "Alte Donau.

3. Replicability, demonstration, transferability, cooperation:

The integrative water and risk management plans were demonstrated for the Alte Donau and can be applied anywhere else in an adapted form. Especially the integrative water management plan and its decision support system will be used in the LIFE project LIFE DICCA, started in September 2018, dealing with the climate change adaption of the Danube Island by establishing ecological improving actions. Data, other inputs, the DSS structure and lessons learned will be taken for the development of the Integrative Climate Action Plan Danube Island.
Further, the GPS-supported mowing management has proved to be effective and can be implemented in a similar way anywhere else without major adaptations. The soil filter solution is certainly adapted to the special situation but the principle could be applied elsewhere.

4. Best Practice lessons

The GPS-supported mowing system works very well but had to be adapted during the project according to the current macrophyte development serval times. Of course, flexibility will also be necessary in the future.
An evaluation of the experiences with the management plans will probably lead to a revision to make the plans as comprehensive as necessary and as compressed as possible in order to make it most practicable.
Minor problems were detected with the soil filter concerning algae growth in the filter bed which appeared to be a seasonal problem. It turned out that stronger shading of the filter might be necessary (e.g. through floating leaf plants) and regular service of the surface is needful to guarantee the permeability of the filter material in the longer term. Furthermore, the solubility of lime depends on the pH-value of the water discharged. If the pH-value rises (e.g. caused by excessive macrophyte growth in the feeding waterbody) the solubility of lime drops and dissolved calcium should be added instead of ground lime.

5. Innovation and demonstration value:

The GPS-supported mowing system, which uses digital maps of aquatic-macrophyte covered area and plant height based on sonar recordings, is an innovative system that clearly demonstrated its practicability to reduce effort and costs. Mowing boats can easily be equipped with the necessary technology. The path of the mowing boat can be tracked and supervised in real time via internet with a specialized software developed within the LIFE+-project.

The increase of macrophyte diversity helps to sustain water quality.
The integrated management of beaver versus trees and leisure activities: The beaver management was successful as the beaver population was constant although trees were protected and recreation areas increased.
The soil filter solution demonstrated that phosphorous can be reduced in a very low concentration range with the methods applied and offers a replicable solution for similar applications.
The water management plans and the risk management plans (tasks B1 and B2) to enhance resilience of the "Alte Donau" versus impacts of climate change demonstrated the applicability and advantages of an integrative approach for water management in an urban area and its manifold and challenging and constantly changing conditions. It is a valuable tool for management decisions that considers the complexity of the entire system and all relevant parameters influencing water quality, ecology and the well-being of citizens, stakeholders and businesses. The integrative water management plan and the risk management plan could also be transferred to other fields of application.
All above measures were successfully implemented and their demonstration value is high. Several cities (e.g. Berlin, Zagreb, Rotterdam, Paris, Lyon, London, Frankfurt, Tallinn, Copenhagen, Mailand, Bucharest etc.) with similar problems are exchanging know-how via the EUROCITIES network (especially the working group on "Sustainable urban water management").
The demonstration value and replication potentials are high.

6. Long-term indicators of the project success:

The most important for the project success in the long-term will be the conservation of good bathing water quality and good ecological water quality. This also comprehends the conservation of species, habitats and biodiversity. Main challenge in future will be climate change which cannot be influenced substantially on a local scale.
Long term indicators for the success are:

- Development of the good environmental status and bathing water quality.
- Performance of the soil filter:
- Water discharge in m^3/a
    - Biological degradation of organic material (e.g. cholorphyllum-a) of the bio-film
    - Physically retainment of fine particles
    - Chemically absorption of phosphorus
    - Actively increase of calcium (by lime milk injection)
- Diversity of macrophytes by number of species and area (in % of lake area)
- Biomass of underwater plants (macrophytes) in t of dry matter of the whole Old Danube
- Share of stonewort plants (Characeae) and other low-growing species (in % of macrophyte area)
- Re-naturated length of the shore
- Number of beavers and beaver lodges
- Number of trees and share of neophytes
- Development of the number of visitors and their degree of satisfaction
- Development of the services, leisure businesses and related jobs at the Old Danube