



After Life Conservation Plan SALT OF LIFE PROJECT

LIFE11 NAT/BG/000362



2018 - 2023

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LIST OF ABBREVIATIONS

BBF	Bulgarian Biodiversity Foundation
BD	Birds Directive (2009/147/EU)
BSBD	Black Sea Basin Directorate - Varna
BSBR	Black Sea Biogeographical Region
BSPB	Bulgarian Society for the Protection of Birds (BirdLife Bulgaria)
EMEP	Enterprise for Management of Environmental Protection Activities (Bulgaria)
EU	European Union
ExEA	Executive Environment Agency (Bulgaria)
FCS	Favorable Conservation Status
FRMP	Flood Risk Management Plan
GIS	Geographical Information System
HD	Habitat Directive (92/43/EEC)
MOEW	Ministry of Environment and Water
NNPC	National Nature Protection Service
SCI	Site of Community Interest under the HD (92/43/EEC)
RBMP	River Basin Management Plan
RIEW	Regional Inspectorate of Environment and Water - Burgas
SEEC	Supreme Expert Ecological Council
SAC	Special Area of Conservation (designated SCI) established under the HD (92/43/EEC)
SPA	Special Protection Area established under the BD (2009/147/EU)
WFD	Water Framework Directive (2000/60/EC)

PROJECT DATA

Project location	South-East District, Bulgaria, Black Sea Biogeographical Region
NATURA 2000 Site	BG 0000270, SCI & SPA
Project start date	01/07/2012
Project end date	31/08/2018
Project duration	74 months
Total budget	2 013 027 €
EU contribution	1 450 558 €
(%) of eligible costs	74,95
Name of Beneficiary	Bulgarian Biodiversity Foundation
Name of the associated beneficiaries:	Chernomorski solnici JSC (BS Salinas Ltd.) Bulgarian Society for the Protection of Birds / BirdLife Bulgaria
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2. INTRODUCTION

“The Salt of Life” Project has been implemented in SPA & SCI Atanasovsko Lake (BG 0000270), designated according to the Birds and Habitat Directives. 27% of the area is protected also under the national Protected Areas Act (Fig. 1).

SCI Atanasovsko Lake is the most significant Bulgarian site for conservation of priority habitat type 1150* Coastal Lagoons. In the Black Sea biogeographical region of the EU, it is on the second place in conservation importance for that habitat type. Other important habitat types associated with 1150* in Atanasovsko Lake include:

- 1310 Salicornia and other annuals colonizing mud and sand;
- 1410 Mediterranean salt meadows;
- 1530* Pannonic salt steppes and salt marshes;

The “Salt of Life” project targets at reaching favorable conservation status of priority habitat type 1150* Coastal Lagoons. In Atanasovsko Lake this habitat type is threatened by extreme flood events, altered water regime, pollution and fragmentation. It was the destructive effect of the disastrous floods in 2006 and especially in 2010, which necessitated the project proposal in 2011.

Another main project goal is providing favorable conditions for six threatened bird species listed in Annex I in the Bird Directive, which suffered severe loss of valuable roosting, breeding and resting habitats due to the floods in 2010. These species are:

- Collared pratincole (*Glareola pratincola*)
- Avocet (*Recurvirostra avosetta*)
- Kentish plover (*Charadrius alexandrinus*)
- Black-winged stilt (*Himantopus himantopus*)
- Little tern (*Sterna albifrons*)
- Sandwich tern (*Sterna sandvicensis*)

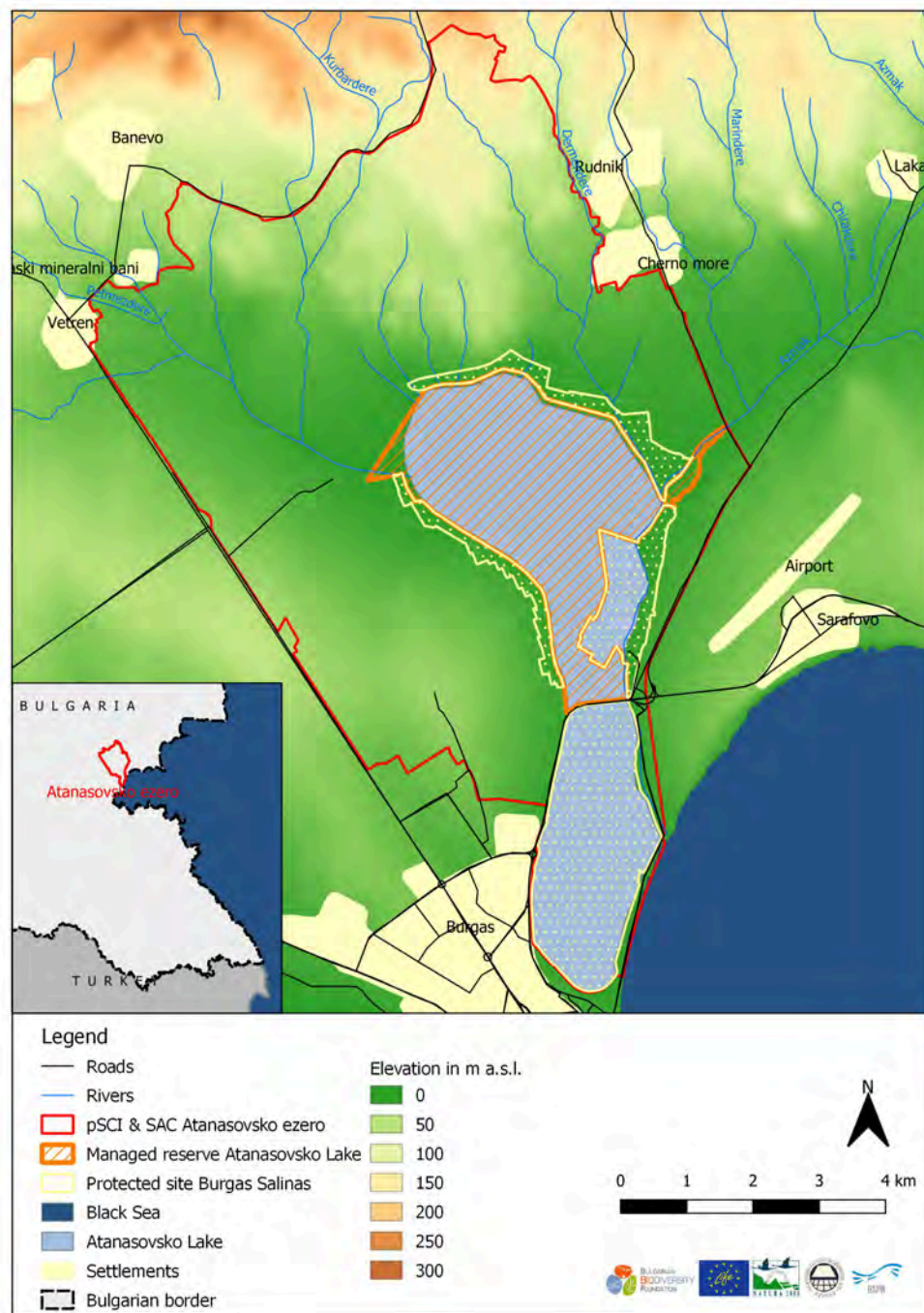


Fig. 1: Location and protection status of Atanasovsko Lake.

The “Salt of Life” project started in July 2012 and has five objectives, three of which deal with conservation effects and two with social effects.

Project objectives

1. To establish a functional, efficient and sustainable infrastructure for water management and control of the coastal lagoon in Atanasovsko Lake. This aims at long-term improvements of habitat conditions and at adaptation to the effects of climate change including changing rainfall patterns and rises in sea-level.

2. To reduce the impact of direct and indirect threats on Atanasovsko Lake lagoon and its priority bird species by securing sustainable habitat management including improvements to existing and creation of new breeding sites for priority bird species.

3. To monitor and evaluate the effects of the proposed habitat restoration measures on the lagoon, other significant habitats, and Annex 1 bird species during the project and to feed this information into future site management plans.

4. To improve the visitor experience at the site and to disseminate the project results to a wide European audience of site managers, ecologists and the general public.

5. To enhance public understanding of the ecological, economic and social values of the coastal lagoons and raise support for the conservation of priority coastal habitats and bird species.

Atanasovsko Lake has been used for more than a century as salinas for traditional (primitive) salt extraction. The lake’s modification into salinas in 1906 has led to separation of the water body into many single water ponds segregated through earth dykes and wooden barriers. The natural ecological processes in the lake are severely changed through the salt production. Keeping the balance between the land/water use and the nature conservation activities is a great challenge for the stakeholders in the area.



3. STRATEGICAL AND PLANNING DOCUMENTS AFFECTING SPA & SCI ATANASOVSKO LAKE

Several different strategical and planning documents (listed below) provision objectives, conservation measures and land use restrictions for Atanasovsko Lake. They have been taken into consideration during the planning and implementation phase of "Salt of Life" Project and during the After-Life planning.

A. Entered into force:

- Integrated management plan for Atanasovsko Lake Managed reserve and Burgas Salinas Protected site 2003-2012;
- Ordinance No.ПД-839 from 17.11.2008 for designation of SPA BG 0000270;
- River Basin Management Plan (RBMP) 2016-2021;
- Flood Risk Management Plan (FRMP) 2016-2021;
- National action plan for conservation of wetlands of high significance in Bulgaria 2013 - 2022
- Conservation action plans for Dalmatian pelican, Red-breasted goose, Lesser white-fronted goose, Eurasian bittern, Pygmy cormorant, Ferruginous duck, White-headed duck, tortoises;
- National Prioritized Action Framework for NATURA 2000 – 2014-2020;
- Burgas Municipality Development Plan 2014-2020;
- Master plan for the city of Burgas 2017

B. In admission process:

- Ordinance for designation of SAC BG0000270;
- Update of the integrated management plan for Atanasovsko Lake Managed reserve and Burgas Salinas Protected site 2015-2024;
- National management strategy for the NATURA 2000 network in Bulgaria

C. Not started:

- Integrated management plan for SPA & SAC Atanasovsko Lake (BG 0000270) SPA



4. SHORT REVIEW OF IMPLEMENTED CONSERVATION ACTIONS IN THE FRAMEWORK OF THE “SALT OF LIFE” PROJECT AND THEIR RESULTS

Action C1. Restore habitats, roosting and breeding sites by dykes and barriers repair

- The condition of habitat type 1150* is improved in regard to the hydrological, hydrochemical and hydrobiological parameters. 46 % of the habitat (708.5 ha) has reached favorable conservation status (FCS) for these parameters. The monitoring data show strong seasonal and spatial dynamics, especially in the northern part of the lake. This is mainly a consequence of a disturbed water circulation which leads to insufficient capability for optimal water level management and connected parameters;
- Habitat type 1310 is in FCS and it covers 10.9 ha more area than at the project start (10 % total area increase) within the SCI
- Preferred and potential nesting and resting places of target bird species on dykes and barriers are restored by repairing 12,000 m dykes and 6,000 m barriers;
- An innovative technology for restoration of wooden barriers by construction of small dykes has been introduced by BS Salinas Ltd. due to the higher efficiency and smaller fragmentation effects on 1150* habitat type. This is a transfer of experience from a Slovenian project in Secovlje Salina Nature Park (LIFE09/NAT/SI/000376). An overall length of 2500 m old wooden barrier were replaced by small dykes;
- The recovery of habitat type 1310 on small dykes has been studied and a report on its conservation status has been completed;
- New occurrences of habitat types 1410 (10.5 ha, 19 times bigger area than originally accepted) and 1530* (scattered) have been located within SCI Atanasovsko Lake;
- So far unknown presence (both in SCI Atanasovsko Lake and BSBR) of habitat type 1340* Inland salt meadows has been located covering 240 ha (3,33% from the total SCI area);
- The halophytic macrophyte *Ruppia maritima* (typical for 1150*) has been located in several water ponds in the northern part of the lake. The species was considered extinct from Atanasovsko Lake in the pre-project period;
- The paper „Ecological Status Assessment of a Hypersaline Lake: A Case Study of Atanasovsko Lake, Bulgaria“, discussing the ecological condition of Atanasovsko Lake in the period 2012-2017, has been published in the magazine Acta Zoologica Bulgarica;
- The paper „Additional Data on Distribution of Mediterranean Salt Meadows in Atanasovsko Lake“, describing the presence of habitat type 1410, is in print in the magazine Comptes rendus de l'Académie bulgare des Sciences;
- Innovative drone technology for observing threats has been tested for the first time in a Bulgarian protected area. It turned out to be appropriate and applicable especially at remote localities with difficult access. The drone technology will be even more useful for different future conservation objectives.



The restoration of infrastructure (dykes, barriers and small dykes) in the framework of C1 Action in the "Salt of Life" project provides more effective water management in Atanasovsko Lake. This leads to improved condition of habitat type 1150 and enhances the efficiency of the salt production. However, sudden changes of the water levels still occur. Disturbed water circulation in the peripheral parts of the lagoon results in lack of fresh water income and in gradual, but complete coverage with Common reed. This causes habitat degradation and loss of conservation value.*

The project team found out the reasons for the disturbed water circulation – several salt production facilities were not identified as crucial and were not included in the project restoration plans. These are three earthed dykes in the northern lake part and many disturbed hydraulic connects between single evaporation bodies due to not functioning (not cleaned) internal water channels. The future restoration of these facilities is expected to result in optimal water management and less fragmentation of 1150 priority habitat, leading to its sustainable favorable conservation status in the entire lake.*

Salinity, water temperature and oxygen saturation are limiting factors for the ecological condition of habitat type 1150. Keeping their optimal levels has a key importance for reaching and securing FCS of 1150*. The separation of Atanasovsko Lake in many basins by the salt production facilities makes the lake heterogenous and leads to many variations of the parameters above, causing difficulties in status assessment. As a reaction to that, the project team has proposed a differentiation of the lake body into three lake types based on salinity gradient. A system of metrics for integrated assessment of the habitat conservation status and ecological condition of the water body must be developed. This will meet the requirements of both Habit Directive and Water Framework Directive.*

Action C2. Secure the lagoon against flood and limit pollution by repairing the Bypass channel and Protective dyke

- Technical projects and detailed construction plans for the repairing work has been elaborated. They will be used during the maintenance of channel and dyke in the After-Life period;
- Coordination with competent authorities in regard of permission procedures turned out to be successful and the trust built will be useful for follow-up actions;
- The Bypass channel has been cleaned, removing sediments, silt and vegetation in its whole length (22,930 m). Thus, the channel supports two times more water conduction from the channel to the sea in comparison with the conduction at the project start;
- Eight illegal sewage water discharges to the Bypass channel have been eliminated;
- The protective dyke has been restored in its whole length of 22,930 m. Additionally, it has been fixed using 172,000 m³ sediment material from the cleaned channel. A dyke road has been formed allowing quick access to every dyke point in cases of nature disasters and other accidents;
- The hydrological conditions in the channel have been improved, including parameters such as electric conductivity and nutrient concentration. Dissolved oxygen and oxygen saturation increased to 13.9 mg/l, respectively – 150 %;

- Specialized equipment has been provided and skills have been built for periodical cleaning and maintenance the conductivity of the channel;
- The newly emerged area of freshwater habitat in the Bypass channel (27 ha) favors the fresh water dependent organisms;
- The whole area of habitat type 1150* (1459 ha) has been protected from floods and nutrients loaded water inflow from the rivers Azmak, Kurbardere and Dermerdere.
- The nutrient concentration in Atanasovsko Lake is decreasing, but is still relatively high due to diffuse underground inflow from surrounding arable lands;
- The needed conductivity of the Bypass channel for sea water inflow to 1150* habitats has been secured;
- Risky facilities such as the sea water sluices and retention water bodies have been localized. Their improper technical condition bears a high risk for floods during extreme rainfalls;



First ever throughout cleaning of the Bypass channel since its excavation at the beginning of the 20th century has been complemented in the framework of "Salt of Life" project. Today the channel can lead all the freshwater inflow securely to the sea, resulting in almost constant water level inside the lake even at heavy and at the heaviest possible rainfalls.

However, the lack of regulation for letting water out of the artificial water reservoirs in the Atanasovsko Lake catchment area at times of intensive rainfalls bears a new threat for securing the FCS of the coastal lagoon. This threat must be combated with adequate measures in the future as heavy rainfalls happen more often due to the climate change.

Action C3. Apply no cost alternative measures to ensure regular seawater influx to the lagoon (action without project budget)

The BS Salinas Ltd. have implemented with own contributions limited actions on maintenance and restoration of the water supply facility – fixing the shore part, taking out sediments in the water discharging area and securing water conductivity. This action has no project financing. BS Salinas Ltd. monitor the sea water quality annually to guarantee pure water inflow into the 1150* habitat. Still, the water supply facility needs a capital restoration in order to be fully functional.



Action C4. Create roosting sites for key bird species in lagoon to ensure better conservation status

- The indicator values for key bird species (Annex 1 BD) set in the project proposal have been reached (see Table 1):

Table. 1 Key bird species and individual numbers

Species	Project proposal indicator value	Number at project start	Maximal number during project span
Collared pratincole (<i>Glareola pratincola</i>)	10	4	70
Avocet (<i>Recurvirostra avosetta</i>)	300	124	602
Kentish plover (<i>Charadrius alexandrinus</i>)	30	14	35
Black-winged stilt (<i>Himantopus himantopus</i>)	40	18	86
Little tern (<i>Sternula albifrons</i>)	15	10	75
Gull-billed tern (<i>Gelochelidon nilotica</i>)	-	0	110
Sandwich tern (<i>Thalasseus sandvicensis</i>)	100	0	109

- New suitable places for nesting and resting of key bird species have been created through construction of 4 wooden platforms and one earthen island with an overall area of 304 m². Additionally, maintenance activities have been undertaken on 172 m² of previously built artificial islands;
- The biggest Bulgarian artificial platform (144 m²) for nesting and resting of the Dalmatian pelican has been built in the lake. More than 100 Dalmatian and White pelicans have already visited the platform for resting and overnight staying in 2017 and 2018;
- The artificial islands have proved to provide suitable conditions for the Common tern. It has increased its numbers 10 times since project start, turning Atanasovsko Lake into the most important site for this species in Bulgaria.
- The Gull-billed tern returned as a nesting bird to Bulgaria after 18 years of absence. Its population in Atanasovsko Lake has reached 3 % of the European population;



- All key bird species show a positive trend in their nesting behavior. However, for some of them fluctuations in numbers have been recorded in the years. These fluctuations are due to species' biological and ecological specifics and different meteorological conditions in the reproduction periods;
- A spatial habitat analysis has been elaborated. It shows the habitat (pond) preferences for feeding of non-nesting birds in the period 2012-2015. The results present an important information source for management decisions in Atanasovsko Lake in regard to birds and biodiversity conservation;

- A protection system against terrestrial predators (pilot for Bulgaria) has been tested annually over an area of 2.5 ha (3100 m dykes). It protects the most valuable bird nesting grounds in Atanasovsko Lake. This activity was very important for limiting the predator threat. It has included also testing of photo and live traps for identifying the species of terrestrial predators, their density and behavior. Both methodologies need development and adaptation to the specifics of Atanasovsko Lake.
- More than 300 volunteers have been trained in construction of artificial islands, maintenance of nesting habitats and monitoring of birds and other elements of biodiversity in organized volunteer campaigns;
- Close collaboration has been established with University of Burgas and local secondary schools for involvement of students and pupils in volunteer campaigns;
- A pilot program for wetland management with theoretical and practical modules has been elaborated and tested. It is oriented towards university undergraduate students in ecology and students of specialized secondary schools for natural sciences;
- A report on existing Bulgarian and foreign experience in the field of construction and significance of artificial islands for bird species has been elaborated;

- A report on the status of invasive plant species during project life span has been elaborated as well as report on the importance and acceptance of artificial islands;
- The developed holistic monitoring methodology can be applied in other lagoons in the BSBR. It allows for adaptation to concrete monitoring objectives and available financial resources;
- The established monitoring results data base with hydrobiological, hydrochemical and ornithology data can be used in future;
- The use of SmartBird Pro software application has been introduced – it is an online database for monitoring data on wild bird species.



The indicator values for key target bird species set in the project proposal have been achieved. The conservation status of vulnerable bird species can be guaranteed through further restoration activities and securing the FCS of the most important nesting habitat type 1310, as well as through construction and maintenance of artificial islands.

An assessment of predation mechanism on nesting birds is needed as well as the further application of measures for its limitation.

Data base maintenance and publishing of data analysis are important tools for future conservation planning.

5. SWOT ANALYSIS AT THE END OF THE „SALT OF LIFE“ PROJECT



In May 2018, a project partners' meeting has been organized to discuss project achievements with main stakeholders – representatives of BSBD, RIEW Burgas, Universities of Burgas and Plovdiv. In a common workshop project's strengths and weaknesses, as well as opportunities and threats in the context of the project end have been identified. The framework of needed future development has been set. The SWOT analysis results have been presented in Fig. 2.

<p>Strengths</p> <ul style="list-style-type: none"> • Effective ecosystem protection • Established mechanisms for traditional sustainable use • Improved ecological and hydrobiological conditions • Successful partnership among NGO, institutions and business • Return of Gull-billed tern as a nesting bird to Bulgaria after 18 years of absence, reaching 3 % of the European population in Atanasovsko lake • Data from a long period documented in a data base (rare for Bulgaria) • Holistic monitoring scheme, which can be implemented by Burgas and Plovdiv universities • Safeguarding nesting colonies against predators • Establishment of public council for Atanasovsko lake and its effective participation in management decisions • Creative communication activities which has won the #ATTHEMUSEUM award • Participating in the final selection of 5 projects for EC NATURA 2000 Communication Award 	<p>Weaknesses</p> <ul style="list-style-type: none"> • The ultimate action for solving the flood problem has not been (and cannot be) implemented (due to its unbearable price) – it is a deep undersea gravity discharge of water from the Bypass channel • Missing involvement of BSBD, Burgas District Administration, Irrigation systems and owners of artificial water reservoirs in effective reservoir management and control over letting water out of reservoirs in Atanasovsko Lake water catchment area • The monitoring scheme does not include analysis of heavy metals, sediments and petroleum products • The predator control system, especially the control over stray dogs, needs further development and involvement of responsible institutions
<p>Opportunities</p> <ul style="list-style-type: none"> • Diversity of habitat types and species of conservation importance – unique for Bulgaria and the BSBR (comparable only with Pomorie Lake, opportunity to combine both lakes in one project scope) • Source of ecosystem services (resources, recreation, culture) • Suitable space for demonstration and pilot conservation actions • Vicinity to a major city (important social function, citizen engagement in protection, easy access) • Good opportunity for environmental education development • Combination of conservation and business development • No major conflicts despite variety of stakeholders and users 	<p>Threats</p> <ul style="list-style-type: none"> • Imperfect and unclear management system for the NATURA 2000 network • Lack of official ordinance for the designation of SAC • The existing management plan for Atanasovsko Lake Managed reserve does not integrate management requirements of the SPA and SAC • Change of management type or management body of the Salinas would lead to halt or abandonment of the salt production, with subsequent loss of biodiversity • Lack of enough human resources (expert and nonexpert personnel for salt production) • Urban development • Intensification of resource utilization • Lack of financing for maintenance and restoration • Insufficient integration of Atanasovsko Lake management in regional plans and strategies • Biogenic pollution and oil spill pollution • Climate change (Extreme rainfalls)

Fig. 2: Results from SWOT analysis, made at closing project meeting with stakeholders, May 2018

6. OVERVIEW OF INSTITUTIONS AND ORGANIZATIONS WITH MANAGEMENT OBLIGATIONS AND RIGHTS TO IMPLEMENT CONSERVATION MEASURES IN ATANASOVSKO LAKE

Atanasovsko lake is not managed by a single centralized body. Table 2 shows all institutions and organizations involved in its management with their functions and capacities at the end of the “Salt of Life” project in 2018. This list helps towards designing objectives and actions for future development and especially for those connected to **Objective 3 Sustainable management of the Protected site Burgas Salinas, Managed reserve Atanasovsko Lake, SAC and SPA Atanasovsko Lake** through building expertise and administrative capacity and through implementation of administrative measures (Table 3).

Institution/ Organization	Main functions connected to the management of Atanasovsko Lake	Human resources	Equipment	Budget
Bulgarian Biodiversity Foundation - BBF	Expert functions for public communication & awareness raising and for monitoring biodiversity; Project design and management; Experience in planning and implementation of conservation measures	Qualified personnel but there is a need of more	Suitable field equipment available	Strong dependence on project financing
Black Sea Salinas (Chernomorski solnici) JSC	Executes salt production according to the management plan of the Atanasovsko Lake Managed reserve and other protection regimes of the area; Maintains and restores salt production infrastructure and water level management in Atanasovsko Lake to ensure evaporation of water and crystallization of salt; Reports the salt production actions and own monitoring results according to the national Water Act	Qualified expert and technical personnel available but there is a need of more employees; Capacity building would be advantageous	Good technical equipment after the “Salt of Life” project	Dependence on project financing; Development opportunity through better marketing of salt products
Black Sea Basin Directorate - BSBD	Control functions – prevention of negative impacts on water bodies; Management and regulation functions – Implementation of the RBMP and FRMP, issue of permits and provision of public information	Not enough experts; Capacity building needed	Suitable equipment available	State budget; Project financing
Bulgarian Society For Protection Of Birds - BSPB	Expert functions for birds monitoring; Project design and management; Experience in planning and implementation of conservation measures	Qualified personnel but there is a need of more	Suitable field equipment available	Mainly project financing
Bulgarian Biodiversity Foundation - BBF	Expert functions for public communication & awareness raising and for monitoring biodiversity; Project design and management; Experience in planning and implementation of conservation measures	Qualified personnel but there is a need of more	Suitable field equipment available	Strong dependence on project financing

Institution/ Organization	Main functions connected to the management of Atanasovsko Lake	Human resources	Equipment	Budget
Black Sea Salinas (Chernomorski solnici) JSC	Executes salt production according to the management plan of the Atanasovsko Lake Managed reserve and other protection regimes of the area; Maintains and restores salt production infrastructure and water level management in Atanasovsko Lake to ensure evaporation of water and crystallization of salt; Reports the salt production actions and own monitoring results according to the national Water Act	Qualified expert and technical personnel available but there is a need of more employees; Capacity building would be advantageous	Good technical equipment after the “Salt of Life” project	Dependence on project financing; Development opportunity through better marketing of salt products
Black Sea Basin Directorate - BSBD	Control functions – prevention of negative impacts on water bodies; Management and regulation functions – Implementation of the RBMP and FRMP, issue of permits and provision of public information	Not enough experts; Capacity building needed	Suitable equipment available	State budget; Project financing
Bulgarian Society For Protection Of Birds - BSPB	Expert functions for birds monitoring; Project design and management; Experience in planning and implementation of conservation measures	Qualified personnel but there is a need of more	Suitable field equipment available	Mainly project financing
Burgas District Administration	Improves actions on lands and in water bodies which are exclusive state property; Organizes actions for flood prevention and implements emergency plans	Not enough experts; Capacity building needed	Not enough equipment	State budget – very limited for concrete actions
Burgas Municipality	Improves actions on lands and in water bodies which are municipal property; Organizes actions for flood prevention and implements emergency plans; Manages the early warning system for emerging floods Owner of the Water Supply & Sewage Network	Not enough experts; Capacity building needed	Not enough equipment	Own municipal budget; Project financing
Executive Environment Agency – ExEA	Design and management of the National System for Environmental Monitoring for monitoring and information on the state of environmental components and factors	Qualified personnel available but there is a need of more employees; Capacity building would be advantageous	Suitable equipment for lab analysis available; Not enough field equipment	State budget; Project financing

Ministry of Environment and Waters – MOEW	Builds and secures the national ecological network; Adopts planning, strategical and administrative documents; Competent authority for investment plans in protected areas where the land is exclusive state property; Implements European environmental law and reports on achieving the common goals; Coordinates the actions of other government bodies and public institutions in the field of environmental protection;	Not enough human resources	Not enough equipment	State budget
Regional Inspectorate for Environment and Waters – RIEW	Ensures and coordinates the management, control and safe guard of the protected area and national ecological network; Control over the regimes and norms, set out in planning and strategical documents; Competent authority for actions and investment plans in protected areas and Natura 2000 network; Maintains data bases and regional registers for protected areas and Natura 2000 network; Organizes monitoring of the quality of a variety of environmental components; Organizes the work of visitor centers; Sanctions violators in legally foreseen cases	Qualified personnel available but there is a need of more employees; Capacity building would be advantageous	Not enough equipment	State budget – very limited for concrete actions; Project financing
University “Paisii Hilendarski” - Plovdiv	Education and scientific functions – research & development of expertise;	Qualified experts in the field of water ecosystem monitoring	Suitable equipment for lab analysis available; Not enough field equipment	Very limited state budget for education & research; Project financing
University "Prof. Dr. Asen Zlatarov" – Burgas	Education and scientific functions – research & development of expertise; Qualifying graduates in the fields of monitoring and protection of water ecosystems	Qualified personnel available but there is a need of more employees; Capacity building would be advantageous	Suitable equipment for lab analysis available; Lack of field equipment	Very limited state budget for education & research; Project financing

6. AFTER-LIFE CONSERVATION PLAN – OBJECTIVES AND ACTIONS

The After-Life plan of the "Salt of Life" project sets the following objectives for the future management of SAC & SPA Atanasovsko Lake:

1. **Achieving and securing FCS of priority habitat type 1150* through:**

- Effective management and maintaining the water regime in Atanasovsko Lake;
- Protection against floods;
- Improvement of water quality

2. **Conservation of priority bird species from Annex I Bird Directive and their habitats:**

- Dalmatian pelican (*Pelecanus crispus*)
- Great bittern (*Botaurus stellaris*)
- Black-winged stilt (*Himantopus himantopus*)
- Avocet (*Recurvirostra avosetta*)
- Kentish plover (*Charadrius alexandrinus*)
- Collared pratincole (*Glareola pratincola*)
- Pygmy cormorant (*Phalacrocorax pygmeus* = *Microcarbo pygmaeus*)
- Little tern (*Sternula albifrons* = *Sterna albifrons*)
- Gull-billed tern (*Sterna nilotica* = *Gelochelidon nilotica*)
- Sandwich tern (*Sterna sandvicensis* = *Thalasseus sandvicensis*)
- Common tern (*Sterna hirundo*)
- Slender-billed gull (*Chroicocephalus genei*)
- Common shelduck (*Tadorna tadorna*)
- Eurasian oystercatcher (*Haematopus ostralegus*)

3. **Conservation of natural habitat types from Annex I Habitat Directive in Atanasovsko Lake SCI to achieve and keep FCS:**

- 1150* Coastal lagoons
- 1310 Salicornia and other annuals colonizing mud and sands
- 1340* Inland salt meadows (*Puccinellietalia distantis*)
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)
- 1530* Pannonic salt steppes and salt marshes

4. **Sustainable management of the protected areas through improvement of the expert and administrative capacity and implementation of administrative measures**

Table 3 gives an overview of the actions which must be implemented in the period after the project end in order to achieve the After-Life objectives. These actions were determined based on the conservation objectives set out in the current plan and on the achieved results and analyzed data in the framework of the "Salt of Life" project. Recently emerged or identified threats for achievement and securing the FCS of habitat type 1150, other relevant habitat types and the priority species were taken into consideration. The SWOT analysis results and results from public consultations have been reflected as well.*

Table 3: Action programme in the After-Life period listed according to the specific objectives

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
1.	Achieving and securing the FCS of priority habitat type 1150* through:						
1.1	Effective management and maintaining the water regime in Atanasovsko Lake;						
1.1.1.	Maintaining and restoring of salt production facilities – dykes, barriers and small dykes	Annually according to operational plan; In case of emergency situations – immediately	Entire water body	Black Sea Salinas ¹	Own budget; Project financing	€€€€€	***
1.1.2.	Repairing and maintaining hydraulic connections between the individual ponds (internal salt channels and internal and main sluices)	Annually according to operational plan; In case of emergency situations – immediately	Entire water body	Black Sea Salinas	Own budget; Project financing	€€€€	***
1.1.3.	Elaboration of dynamic hydraulic model of Atanasovsko Lake	2020	Water catchment area of Atanasovsko Lake	BSBD, Burgas District Administration, BBF	Project financing	€	***
1.1.4.	Restoration of 3 earth dykes in the northwest part of Atanasovsko Lake	2023	Northern part of the Lake	Black Sea Salinas	Project financing	€€€€€	***
1.2.	Protecting habitat type 1150* against floods						
1.2.1.	Restoration of main sluice gates providing for sea water inflow	2023	Northern and Southern main sluices	Black Sea Salinas	Own budget; Project financing	€€€€€	***
1.2.2.	Establishing a working group for control and managing water outflow from artificial water reservoirs in the Atanasovsko Lake catchment area with the participation of Black Sea Salinas JSC, Burgas Municipality, Burgas District Administration, BBF and owners of artificial reservoirs	2019	-	Black Sea Salinas, BSBD, Burgas Municipality, Burgas District Administration, BBF	Own budget; Project financing	€	***
1.2.3.	Restoring and maintaining of Bypass channel and Protective dyke	Annually according to operational plan; In case of emergency situations – immediately	22 930 m Bypass channel 22 930 m Protective dyke around entire water body	Black Sea Salinas	Own budget	€€€€€	***

¹ Th user – Black Sea Salinas (Chernomorski solnici) JSC – but also every other legal entity who is carrying out salt production in the lake in case of any user changes

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
1.2.4.	Restoration of one retention basin	2023	Mouth of Kurbardere river	Black Sea Salinas	Project financing	€€€€€	***
1.2.5.	Constructing of a deep undersea gravity discharge facility for water from the Bypass channel	2023	Southern part of Bypass channel in the region of "Atanasovska kosa"-Beach	Black Sea Salinas, Burgas District Administration, Burgas Municipality, BSBD	Own budget; Project financing (incl. EU Structural Funds), EMEPA	€€€€€	***
1.2.6.	Restoration of sluice at Azmak river and river mouth deepening	2023	Azmak river mouth	Black Sea Salinas, Burgas District Administration, BSBD	Own budget; Project financing (incl. EU Structural Funds), EMEPA	€€€	**
1.2.7.	Restoration and recultivation of a quarry, owned by Keramika Burgas Jsc and securing its connection to the Azmak river	2023	Quarry owned by Keramika Burgas Jsc	Keramika Burgas Jsc, Burgas District Administration, BSBD	Own budget; Project financing (incl. EU Structural Funds), EMEPA	€€€	*
1.2.8.	Further development of the early warning system for emerging floods	2023	Water catchment area of Atanasovsko Lake	Burgas District Administration	Own budget; Project financing (incl. EU Structural Funds), EMEPA	€€	*
1.3.	Improvement of water quality						
1.3.1.	Ensuring possibility to inundate the peripheral part of the lake	2020	Western parts of the lake	Black Sea Salinas, BBF	Own budget; Project financing	€€	***
1.3.2.	Reduction of reed-bed masses	2023	Big reed-bed masses in the northern, western and southwestern part of Atanasovsko Lake, Azmak river mouth	BSPB, BBF, Black Sea Salinas, private investors	Own budget; Project financing	€€	***
1.3.3.	Research on the possibilities to introduce typical fish species (cyprinids and mullets) in the Bypass channel	2023	Bypass channel – northern part	BBF, BSPB, Black Sea Salinas, Non-profit Organization "GLARUS Sport Fishing Club"	Own budget; Project financing	€	**

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
1.3.4.	Research on the possibilities to use typical halophytic macrophytes as a green filter in the lake	2023	Northern part of the lake	BBF	Own budget; Project financing (incl. EU Structural Funds)	€€	**
1.3.5.	Examination of old depots from the mining and petroleum industries in the northern lake part for contamination sources; Developing of appropriate threat limitation and recultivation measures	2023	Northern part of the lake	Plovdiv and Burgas universities, ExEA, BSBD, BBF	Own budget; Project financing	€€	**
1.3.6.	Research on diffuse pollution mechanisms from neighboring agricultural lands; Developing of appropriate threat limitation measures	2023	Northern part of the lake	BBF, Plovdiv and Burgas universities, ExEA, BSBD	Own budget; Project financing	€	**
1.3.7.	Implementation of measures from the RBMP to limit pesticides use in the agriculture	2023	Northern part of the lake, southern part of the lake	BSBD	Project financing	€€	**
1.3.8.	Reconstruction and modernization of the sea water supply facility	2023	Sea water supply facility	Black Sea Salinas	Own budget; Project financing (incl. EU Structural Funds), EMEPA	€€€€€	*
1.3.9.	Research on the possibilities for alternative Bypass channel water clearing previous to discharge in the sea though a system of green filters	2023	Sothern part of the lake	BBF, Black Sea Salinas, BSBD	Own budget; Project financing (incl. EU Structural Funds)	€€	*
1.3.10.	Research on possibilities for biofiltration or carbon fixation through aquaculture	2023	Sothern part of the lake	BBF, Black Sea Salinas, Non-profit organization "GLARUS Sport Fishing Club"	Own budget; Project financing (incl. EU Structural Funds)	€€€	*

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
2.	<i>Ensuring and securing FCS of natural habitats and key species</i>						
2.1.	Conservation of priority bird species from Annex I Bird Directive and their habitats						
2.1.1.	Periodical maintenance of important habitats for priority nesting birds in the northern part of Atanasovsko lake (filling up, cleaning of vegetation)	2023	northern part of Atanasovsko lake	BSPB, Black Sea Salinas	Own budget	€€€	***
2.1.2.	Maintenance of the constructed earth islands and wooden platforms	2023	Artificial islands	BSPB, BBF	Own budget	€	***
2.1.3.	Protection measures for nesting birds against predators	2023	Entire water body	BSPB	Own budget	€	***
2.1.4.	Creating favorable conditions for Great bittern in Kurbardere river mouth	2023	Kurbardere river mouth	Black Sea Salinas, BBF, BSPB	Project financing	€€€€€	***
2.1.5.	Research on the possibilities for mechanized construction of earth islands in the big ponds and pilot actions in this regard	2023	North part of the lake	BSPB, Black Sea Salinas, RIEW	Own budget, Project financing	€	**
2.1.6.	Creating favorable conditions for nesting of Dalmatian pelican	2023	South part of the lake	BBF, BSPB	Own budget, Project financing, Private	€€	**
2.1.7.	Creating favorable conditions for Sandwich tern, Gull-billed tern and Little gull	2023	North part of the lake	BSPB	Own budget, Project financing	€€	**
2.1.8.	Coordination of conservation actions with the ones implemented in Pomorie Lake	2020	-	BBF, BSPB, Green Balkans Federation of Nature Conservation NGOs, Black Sea Salinas, Pomorie Salinas JSC	Own budget, Project financing	€	**
2.2.	Conservation of natural habitat types from Annex I Habitat Directive to achieve and secure FCS						
2.2.1.	Restoration of the <i>Ruppia maritima</i> population, research on the possibilities for reintroduction of other halophytic macrophytes	2023	North and south part of the lake	BBF, Plovdiv and Burgas universities	Project financing	€€	***

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
2.2.2.	Establishment of a support fund for sustainable management of Atanasovsko Lake ²	2023	-	BBF	Project financing	€	***
2.2.3.	Detailed mapping of habitat types 1530* and 1340* in the SAC	2019	North part of the SCI	BBF, ExEA, Bulgarian Academy of Science	Project financing	€	***
2.2.4.	Implementation of measures against plowing of priority habitats of the types 1530* and 1340* in the SAC	2023	Agricultural lands in the SCI	RIEW, BBF	Project financing, EMEPA	€	**
3.	<i>Sustainable management of the protected areas through improvement of the expert and administrative capacity and implementation of administrative measures</i>						
3.1.	Introduction of an educational course dedicated to wetland management in the Ecology Master's Programmes of the universities	2023	-	BBF, Plovdiv and Burgas universities	Project financing, Own budget	€	***
3.2.	Enforcing of the management plan update for Atanasovsko Lake Managed reserve	2019	-	RIEW, MOEW/ NNPC, SEEC, Council of ministers	-	-	***
3.3	Establishment of a specialized management body for the Network 2000 network in Bulgaria	2020	-	MOEW, Council of ministers	State budget	€	***
3.4.	Increasing the capacity of responsible institutions for sustainable management of the national protected areas, the SPA and the SAC (RIEW, Burgas District Administration, Burgas Municipality, BSBD)	2023	-	BBF, BSPB, MOEW	State budget, project financing	€€	***
3.5.	Official designation of the SAC BG 0000270 according to the HD	2019	-	RIEW, MOEW	-	-	***
3.6.	Integration of SAC's and SPA's conservation targets and objectives into municipal and regional strategical and other planning documents and impact assessments	2023	-	BSBD, RIEW, MOEW, Burgas District Administration, Burgas Municipality	-	-	***

² The Sustainable management support fund for Atanasovsko Lake is orientated towards supporting conservation actions for key species and habitats.

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
3.7.	Implementation and control over observation the regimes set out in the designation order for the SPA Atanasovsko Lake	annually	-	RIEW	Own budget	€€€	***
3.8.	Establishment of specialized management administration for the Managed reserve Atanasovsko Lake and the Protected site Burgas Salinas	2023	-	MOEW, NNPC, RIEW	Own budget	€€€	***
3.9.	Cooperation for protection of Atanasovsko Lake through annual meetings of Atanasovsko Lake Public Council	annually	-	BBF	Project financing	€	***
3.10.	Developing and testing an integrated model for conservation status assessment of habitat type 1150* according to both HD and WFD	2020	-	BBF	Project financing	€€	***
3.11.	Developing of a model for enhancing the added value of the salt production and use of ecosystem services provided by the lake to support conservation actions	2023	-	BBF, Black Sea Salinas	Project financing	€€€	***
3.12.	Elaboration and entering into force of an integrated management plan for the SPA and SAC BG 0000270 Atanasovsko Lake	2021	-	RIEW, MOEW, Management body for Natura 2000 network	State budget, Project financing	€€	**
3.13.	Preparation and approval of an SDF actualization for SPA and SAC BG 0000270	2018-2019	-	BBF, BSPB, MOEW/ NNPC	Own budget	€	**
3.14.	Elaboration of plans for letting water out of the artificial water reservoirs in the Atanasovsko Lake water catchment area	2019	-	BSBD, RIEW, Black Sea Salinas, Reservoir owners	Own budget	€	**
3.15.	Designation of the borders of Managed reserve Atanasovsko Lake and Protected site Burgas Salinas with permanent field markers	2020	Managed reserve and Protected site	RIEW	Own budget	€	*

Code	Objectives and actions	When, how often	Where	Who	Sources of finance	Needed finances	Priority
4.	Monitoring						
4.1.	Monitoring of the main hydrological and physicochemical parameters of habitat type 1150*	2018-2023	Entire water body	Black Sea Salinas, Burgas University, ExEA, BSBD, Non-profit organization "Zaedno 2011"	Project financing, own budget	€	***
4.2.	Design and installation of at least 4 automatic monitoring stations for main hydrological and physicochemical parameters	2020	Key locations in Atanasovsko Lake – 2 in the north part and 2 in the south part of the lake	Non-profit organization "Zaedno 2011", BBF, BSBD	Project financing	€€€	***
4.3.	Hydrobiological monitoring (macrozoobenthos, phytoplankton, macrophytes, fish species)	2019-2023	Entire water body	BBF, Black Sea Salinas, Plovdiv and Burgas Universities, Bulgarian Academy of science, BSBD, ExEA	Project financing, own budget	€€	***
4.4.	Birds monitoring	2018-2023	SPA	RIEW, ExEA, BSPB	Project financing, own budget	€	***
4.5.	Habitat and vegetation monitoring	2018-2023	SAC	ExEA, RIEW	Project financing	€€	***
4.6.	Monitoring the safety and technical condition of the infrastructure (Bypass channel, Protective dyke, internal dykes and barriers, small dykes, internal channels, hydraulic connections, sluices)	annually	Entire water body	Black Sea Salinas, Non-profit organization "Zaedno 2011"	Own budget	€	***
4.7.	Monitoring of the sediments and of the pollution with petroleum products and heavy metals	2018-2023	North part of the lake	BBF, BSBD, ExEA, Bulgarian Academy of Science, Plovdiv and Burgas universities	Project financing, own budget	€€	***
4.8.	Mammal and predation monitoring	2018-2023	Entire water body	BSPB, Bulgarian Academy of Science	Own budget	€€	**

Legend:

*Budget needed: € = up to 5000 euro; €€ = between 5 000 and 10 000 euro; €€€ = between 10 000 and 50 000 euro; €€€€ = between 50 000 and 100 000 euro; €€€€€ = more than 100 000 euro. Priority: ***= the action is absolutely necessary and crucial for reaching the objectives; **= it would be very good to implement this action – it will lead to enlarged scope and efficiency of the project; * = this action may be implemented if there are free financial means*

Web site of the project <http://saltoflife.biodiversity.bg>
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