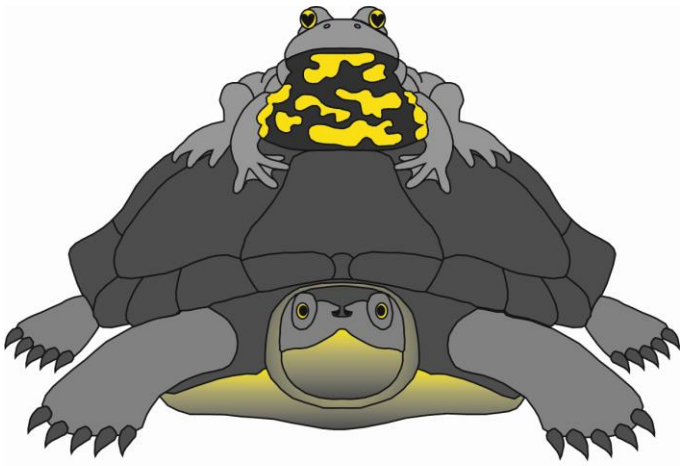
AFTER-LIFE CONSERVATION PLAN

PROJECT
Active protection of rare amphibian and reptile species in the Natura 2000 sites in Europe



LIFE17 NAT/PL/000011

Warmińsko-Mazurskie Voivodeship, „Man and Nature" Association,
Amphi International ApS
http:// pkpr.life17.pl

Olsztyn-Krzywe-Odense, 2023

Contenst

I. Introduction

The implementation of the project *"Active protection of rare amphibian and reptile species in the Natura 2000 sites in Europe"* was completed on December 31, 2023. This study (After-LIFE Conservation Plan) specifies how and which activities initiated under the above Project will be continued and developed in the years following the end of the Project, how long-term management of the facilities/habitats/species covered by the Project will be ensured and how the dissemination of the Project results will continue after the end of the Project.

The plan also includes information on how, when, by whom, at what financial costs, and with which sources of founding the actions will be continued.

II. Project characteristics

II.1. Project information

Project Beneficiaries::

Warmian-Masurian Voivodeship - Poland (Coordinating beneficiary)

"Man and Nature" Association - Poland (Co-beneficiary)

Amphi International ApS - Denmark (Co-beneficiary)

Areas covered by the Project:

Natura 2000 „Mazurska Ostoja Żółwia Baranowo" PLH280055

Natura 2000 „Ostoja Piska" PLH280048

Natura 2000 „Puszcza Romincka" PLH280005

Natura 2000 „Ujście Ilanki" PLH090015

Natura 2000 „Sydfynske Øhav" DK008X201

Project implementation period:

July 2, 2018 - December 31, 2023 (66 months)

Total Project budget: 2.765.954 EUR

Funding from the European Commission: 1,659,572 EUR

Financing from the National Fund for Environmental Protection and Water Management: 825,255 EUR

Co-financing of the Voivodeship Fund for Environmental Protection and Water Management in Olsztyn: 18,928 EUR

II.2. Project goals

The strategic goal of the project was to improve the conservation status of the European pond turtle *Emys orbicularis* and the fire-bellied toad *Bombina bombina* in five Natura 2000 areas in Poland and Denmark. The specific goals of the project included:

- increasing the area and improving the conservation status of breeding habitats and habitats of the European pond turtle and fire-bellied toad,
- increasing the population size and preventing the extinction and isolation of the European pond turtle and fire-bellied toad,
- increasing the level of knowledge and ecological awareness of local communities regarding the protection of rare species of amphibians and reptiles.

The assumed objectives of the Project were achieved, among others, thanks to the following actions:

1. construction of a water dam in Nowe Sady (Mazurska Ostoja Żółwia Baranowo) in order to increase the habitat of the European pond turtle and the breeding habitat of the fire-bellied toad to 2.3 ha;
2. construction of three underpass passages systems for small vertebrate animals in order to eliminate migration barriers isolating the European pond turtle populations (Mazurska Ostoja Żółwia Baranowo, Ostoja Piska, Ujście Ilanki);
3. revitalization/construction of 77 water reservoirs for amphibians, including the fire-bellied toad, within the boundaries of Natura 2000 areas: Romincka Forest (Poland) and Sydfynske Øhav (Denmark) and restoration of 1.33 ha of pond turtle habitats - within the boundaries of the Natura 2000 area: Mazurska Ostoja Turtle Baranowo;
4. construction of 18 hibernation sites for amphibians, including the fire-bellied toad, within the boundaries of the Romincka Forest and Sydfynske Øhav Natura 2000 areas;
5. protection of 1.4 ha of breeding habitats of the European pond turtle within the boundaries of the Natura 2000 area: Mazurska Ostoja Żółwia Baranowo;

6. restoration the fire-bellied toad population on the island of Skarø, ensuring the preservation of the genetic variability of this species in Denmark (within the Sydfynske Øhav Natura 2000 area);
7. implementation of informational and educational activities.

II.3. Main activities carried out in the project

Preparing places for protective actions

The end result of the actions

The result of the actions was, among others: verification (using eDNA tests) of the presence of the European pond turtle at 25 sites - potential locations of this species, and selecting water reservoirs in Denmark that are the breeding places of the fire-bellied toad and obtaining permission to collect fire-bellied toad eggs from these reservoirs for breeding purposes. The results of these actions allowed planning and implementation of active protection measures for the European pond turtle (Poland) and the fire-bellied toad (Denmark).

Action strategy after the project completion

The results of the eDNA research were prepared in the form of a report and will be used in the future to assess the size of the pond turtle's habitat. The action will be repeated in about 10 years - in the same reservoirs, and its results will be compared to the results obtained in the Project. The fire-bellied toad breeding activity in Denmark is not planned to continue after the end of the project, therefore it is not necessary to obtain permits.

Preparation of documentation for technical activities related to water management

The end result of the action

The result of the activity was (i) preparation of a technical design for the dam in Nowe Sady; (ii) preparation of a hydrological opinion regarding the entire catchment area of Lake Jorzec, including the swampy area in Faszcze; (iii) preparation of a hydrological expertise of the partial catchment of the Cudnochy tributary; (iv) preparation of a water-legal report for the project related to the construction of a dam in Nowe Sady (this document was prepared in exchange for a water-legal report for the restoration of water reservoirs in Faszcze); (v) obtaining a permit from the municipality of

Svendborg for the construction of 12 water reservoirs in the area of Sydfynske Øhav DK008X20 (18 permits were obtained, of which 12 were used).

The results of the above actions allowed for planning and carrying out active protection measures, ensuring the appropriate protection status of the local population of the European pond turtle and fire-bellied toad and their habitats.

Action strategy after the project completion

The prepared hydrological expertise will be made available to all entities planning to protect the pond turtle habitats in the area of the Mazurska Ostoja Żółwia Baranowo. They will also be used to prepare a new application for the LIFE Program regarding the protection of herpetofauna in north-eastern Europe. Part of the financial resources for the restoration of the pond turtle habitat in the area of the Mazurska Ostoja Żółwia Baranowo, planned in 2025-2027, will be obtained from the European Funds for Infrastructure, Climate, Environment Program (see Chapter IV).

Construction of a water dam in Nowe Sady

The end result of the actions

The result of the actions was the construction of a water dam in Nowe Sady, on a ditch draining the area where the pond turtle occurs, which significantly improves the humidity conditions in this area.

Action strategy after the project completion

Members of the "Man and Nature" Association will regularly monitor the technical condition of the dam and, if necessary, will find financial resources to carry out repair and conservation activities.

Construction of three systems of underpass passages for small vertebrate animals

The end result of the action

The end result of the action was the construction of three systems of underpass passages for small vertebrate animals, including the European pond turtle.

The first system of passages was built on a 576-meter section of national road No. 16 near the town of Prawdowo (the system consists of 7 tunnels with a total length of 84 m, 14 portals, guide barriers with a total length of 870 m and stop-grids with a length of 8 m).

The second system was built on a 452-meter section of national road No. 16 near the town of Kosewo (the system consists of 7 tunnels with a total length of 84 m, 14 portals, guide barriers with a total length of 870 m and stop-grids with a length of 30 m).

The third system was built on a 300-meter section of district road No. 11252F near the town of Rybocice (the system consists of 5 tunnels with a total length of 48 m, 10 portals, guide barriers with a total length of 600 m and stop-grids with a length of 7 m).

The construction of safe passages for small vertebrate animals, including the European pond turtle, on road sections that crossed the migration routes of these animals, reduced the mortality of turtles as a result of collisions with vehicles.

Action strategy after the project completion

During the Project's durability, individual beneficiaries (the Warmian-Masurian Voivodeship in the Natura 2000 areas: Mazurska Ostoja Żółwia Baranowo and Ostoja Piska, and the "Man and Nature" Association in the Natura 2000 area Ujście Ilanki) will take care of the technical condition of the underpass systems. After the Project's durability, the systems will be handed over to the relevant road management authorities (General Directorate for National Roads and Motorways, Olsztyn branch, and the Provincial Roads Authority in Zielona Góra), which will continue to ensure their functionality.

Actions related to maintaining the systems of lower passages for animals in good technical condition will be partially covered from the beneficiaries' own financial resources (the Warmian-Masurian Voivodeship covers the costs of annual insurance of two systems of lower passages), and if it is necessary to commit more funds, individual beneficiaries will try to obtain them from the Provincial Fund for Environmental Protection and Water Management in Olsztyn and Zielona Góra, the National Fund for Environmental Protection and Water Management or the Re:Generacja Program (see Chapter IV).

Revitalization of ponds and construction of hibernation sites for amphibians

The end result of the action

The effect of the action was the reconstruction of 65 water reservoirs in Poland with an area of 500 m^2 each (with a total area of 32,500 m^2) and in Denmark 6 reservoirs (with a total area of 5,088 m^2) and the construction of 6 new

reservoirs in Denmark (with a total area of 9,521 m^2). Moreover, 12 hibernation sites for amphibians were built in Poland and 6 were built in Denmark.

Reconstructed/constructed water reservoirs serve amphibians mainly as breeding places (water remains in them all year round, which allows amphibians to fully develop from eggs to adults), and hibernation sites as wintering places.

Action strategy after the project completion

In Poland, the Warmian-Masurian Voivodeship (the beneficiary of the Project) will regularly monitor the condition of recreated reservoirs and hibernation sites, and the process of their use by amphibians. If there is a need to repeat reclamation treatments (for reservoirs) or repair hibernation sites, the beneficiary, in consultation with the owners of the land on which reservoirs and hibernation sites are located, will apply for funding for this purpose from the appropriate funds (see Chapter IV). In the event of identifying fish in the restored water reservoirs that pose a threat to amphibians, the beneficiary will take action to remove these undesirable animals from the reservoirs. These actions will involve regular fishing using a fishing net until all individuals are caught.

In Denmark, the Municipality of Svendborg, responsible for implementing conservation actions in the Natura 2000 site Sydfynske Øhav, and therefore in Skarø, will be responsible for maintaining the restored and new water reservoirs created in the project as a fire-bellied toad habitat. It is not expected that wintering areas will require intervention. All recreated and constructed water bodies in Denmark are automatically protected under the Nature Conservation Act, which protects water bodies larger than 100 m^2.

Based on previous experience, it is expected that water reservoirs will require maintenance no sooner than 10 years after revitalization. If it is necessary to carry out such maintenance, the Municipality of Svendborg will carry out it from its own funds or from funds obtained for this purpose.

It was agreed with the municipality that the project actions will be included in the Action Plan for the Natura 2000 area Sydfynske Øhav 2022-2027 currently being prepared by the Municipality of Svendborg, which will be made public no later than July 3, 2024[1].

[1] https://mst.dk/erhverv/rig-natur/naturindsatser/natura-2000/natura-2000-planlaegning-2022-2027

Protection of living and breeding habitats of the European pond turtle

The end result of the actions

The effect of the action was (i) the reconstruction of two water reservoirs divided by a dike and connecting them with a culvert (in the town of Faszcze) - with a total area of 2,600 m^2, (ii) the reconstruction of the water reservoir in the town of Cudnochy - with an area of 350 m^2 and (iii) the reconstruction of the water reservoir in the town of Baranowo - with an area of 350 m^2, (iv) building a grid fence around the breeding ground of the European pond turtle, with a total area of approximately 5 ha, (v) protecting the European pond turtle's nests (using the so-called electric shepherd) against predators and (vi) protection of the pond turtle's breeding area against overgrowth with herbaceous vegetation and shrubs.

The implementation of the measure improved the condition of the European pond turtle's living and breeding habitats and completely eliminated the influence of predators on the breeding sites.

Action strategy after the project completion

The "Man and Nature" Association will continue to carry out activities related to the protection of the living and breeding habitats of the European pond turtle in the area of the Mazurska Ostoja Żółwia Baranowo. In the event of damage to the grid fence of the breeding ground or excessive overgrowing and shallowing of restored water reservoirs, it will take appropriate remedial actions.

The Association will also systematically protect the turtle hatchings against predators by fencing the direct breeding area with an electric shepherd. It will also mow herbaceous vegetation and saplings of trees and shrubs from the breeding site.

The above activities will be financed from own or external funds, e.g. from the Re:Generacja Program or the FEnIKS Program (see Chapter IV).

Restoration of Protected Species Populations - European fire-bellied toady

The end result of the actions

The action resulted in the restoration of a breeding population of the European fire-bellied toad on the island of Skarø. Approximately 3,400 young individuals

bred as part of the Project were released into restored and newly dug water reservoirs on the island of Skarø. To compensate for the collection of about 4,100 eggs for breeding, 12% of the juveniles (approximately 500 individuals) were released on the island of Birkholm.

The implementation of this action has led to an increase in population size, preservation of genetic diversity, restoration of the range, and prevention of the decline of the European fire-bellied toad population in Denmark.

Action strategy after the project completion

Amphi International ApS does not foresee the continuation of this action in the coming years. Based on the beneficiary's previous experiences, the introduction of over 3,000 young toads into new water reservoirs is sufficient to establish a viable population whose numbers will increase from generation to generation.

Monitoring of the European pond turtle population - use of passages, presence on breeding sites, presence in restored habitats

The end result of the actions

The actions resulted in the following findings: (i) properly prepared camera traps (with a wide-angle lens) can be used to monitor the effectiveness of underpass passages for small vertebrates; these structures are used by numerous small vertebrate species, including European pond turtles; (ii) using drones is an excellent method for monitoring the European pond turtle; It is more effective than observations using binoculars, faster, and less intrusive to the environment; (iii) the electric shepherd is a very good method of protecting the European pond turtle hatching against predators (during the operation of the electric shepherd, no nest destruction was observed); (iv) the condition of the European pond turtle population in the Mazurska Ostoja Żółwia Baranowo is poor, indicating a continuing decline; (v) the population of the European pond turtle in the Natura 2000 area Ujście Ilanka is threatened by an invasive species of foreign origin - the ornamental turtle.

The implementation of the action has therefore contributed to increased knowledge about the significance of underpass passages for small vertebrates, the conservation status of the European pond turtle population in the Mazurska Ostoja Żółwia Baranowo, the threats to the European pond turtle population in the Natura 2000 Ujście Ilanki area, and the methods for monitoring the European pond turtle population.

Action strategy after the project completion

Monitoring the ecological effects of conservation actions directed at the European pond turtle, conducted within the framework of the project, will be continued during the project's durability period. Representatives of the relevant beneficiaries (the Warmian-Masurian Voivodeship for the underpass passages systems located in the Natura 2000 areas of Mazurska Ostoja Żółwia Baranowo and Ostoja Piska, and the "Man and Nature" Association for the underpass passages system located in the Natura 2000 area of Ujście Ilanki and the breeding area of the European pond turtle in the Mazurska Ostoja Żółwia Baranowo) will check the functionality of the passages for the European pond turtle and monitor the presence of the European pond turtle in the habitats restored for it, particularly focusing on the effectiveness of its breeding.

The location of the research areas and the monitoring methods will closely follow the studies conducted by herpetology specialists during the implementation of the Project (Final Report on the Duties of the Herpetology Specialist in the LIFE17 NAT/PL/000011 Project, 2023), allowing for comparison of the obtained results. The results of the ongoing monitoring aim to determine the effectiveness of the conservation measures carried out and will serve as a basis for planning similar actions in other areas.

Actions related to the monitoring of the European pond turtle population will be partially funded by the beneficiaries' own financial resources. In the event that additional funds are required, the individual beneficiaries will seek to obtain them from the Regional Fund for Environmental Protection and Water Management (WFOŚiGW) in Olsztyn and Zielona Góra, or from the National Fund for Environmental Protection and Water Management (NFOŚiGW) (see Chapter IV).

Monitoring of amphibian populations in restored ponds and hibernation sites

The end result of the actions

The final result of the actions was the development of two reports (Final report on the monitoring of amphibian colonization of 50 water reservoirs in the years 2020-2023 and Final report on the monitoring of amphibian colonization of 12 hibernation sites in the years 2020-2023). These reports describe the ecological effects of the conservation actions conducted within the Project in Poland, focusing on the restoration of water bodies as breeding and habitat sites for amphibians and the construction of hibernation sites for

amphibians. In most of the water reservoirs, amphibians appeared and began breeding just a few months after the restoration. It is particularly important that these water bodies retain water throughout the year, allowing amphibians to complete their full development cycle.

In Denmark, monitoring conducted in 2022 and 2023 demonstrated the colonization of seven water reservoirs by the restored population of the European fire-bellied toad. Breeding of the toads was observed in two of these water bodies, confirming the success of the species' reintroduction on the island of Skarø.

Action strategy after the project completion

The monitoring of amphibians in restored water reservoirs and constructed hibernation sites in Poland will continue to be conducted by the "Man and Nature" Association. The results of this monitoring will form the basis for taking or initiating actions aimed at maintaining the ecological functionality of these sites. These actions may include cleaning the ponds, removing fish, and repairing and maintaining the amphibian hibernation sites. These activities will be carried out in accordance with the results of the monitoring conducted within the framework of the Project, using the Association's own financial resources and personnel.

In Denmark, the restored population of the European fire-bellied toad will be monitored through the national monitoring system for the species as part of the NOVANA program (https://novana.au.dk/om-novanaaudk). This monitoring will take place at least once every three years and will be based on the presence of calling males.

Informational and educational activities

The end result of the actions

The effect of the activity was: (i) the development and maintenance of the Project website (www.pkpr.life17.pl) by the coordinating beneficiary; (ii) publishing a folder about the Project in Polish and English, with a total circulation of 1,500 copies; (iii) conducting an international, three-day conference for 80 people, which took place in September 2023 in Ryn; (iv) publishing an educational package in a circulation of 1,000 pieces (including a brochure, work cards, an observation card, a puzzle and a Memory game) and parts of the package (without puzzles and a game) in a circulation of 4,000 pieces; (v) conducting 21 educational meetings (75 hours in total) in

13 institutions in the Podlaskie and Warmian-Masurian Voivodeships and (vi) participating in 18 industry meetings during which the assumptions and results of the Project were presented.

The implementation of these actions contributed to the dissemination of information about the Project and its results, and increased public knowledge about the biology, ecology, significance, and conservation methods of amphibians and reptiles.

Action strategy after the project completion

It is essential to continuously educate local communities, especially their youngest members, about the biology, ecology, significance, and active conservation methods of herpetofauna. Developing a sense of unity with nature and responsibility for its condition is crucial. Therefore, all informational and educational activities will continue after the completion of the Project, with their scope and methods evolving as new experiences and skills are gained in this field. For this purpose, the educational materials produced for the Project (educational packages) will be used. The costs of these informational and educational activities will be partially covered by the beneficiaries' own financial resources. If additional funds are required, the individual beneficiaries will seek to obtain them from the Regional Fund for Environmental Protection and Water Management (WFOŚiGW) or the National Fund for Environmental Protection and Water Management (NFOŚiGW) (see Chapter IV).

II.4. Analysis of the situation (SWOT Analysis)

One of the most significant threats to amphibian and European pond turtle populations is the loss of optimal habitats for these animals. Water environments necessary for amphibian reproduction and European pond turtle habitation are disappearing due to human activities, such as the draining of wetlands and floodplains or the filling of small water reservoirs. Climate change (especially water deficits in the environment) and natural processes of vegetation succession also lead to the gradual overgrowth of small water reservoirs and breeding sites, consequently contributing to the destruction and reduction of the natural habitat area for amphibians and reptiles. In Denmark, climate change causes more frequent strong storms and, as a result, more frequent flooding of low-lying freshwater ponds on islands with seawater, leading to similar consequences.

Increasing vehicular traffic is also of great significance, posing a direct threat to migrating amphibians and reptiles whose migration routes intersect with roadways, leading to their death due to collisions with vehicles. Indirectly, it disrupts the structural continuity of migration (ecological) corridors and habitats (habitat fragmentation). A major threat, especially to the European pond turtle population, is the destruction of nests by predators. In recent years, the threat from invasive alien animal species, which displace them from their habitats or disrupt local food chains, has also been increasing.

The implementation of the project has improved the living conditions of amphibians, including the fire-bellied toad and the European pond turtle. Among other things, it has enabled turtles to safely cross roads, which had been a significant barrier for them, thereby reducing the mortality of the European pond turtle on selected road sections. The active conservation methods applied for amphibians, including the fire-bellied toad, largely ensure the long-term durability of the actions' effects and should, in the long run, improve the conservation status of these animal populations in the areas covered by the Project.

SWOT Analysis
- opportunities for the protection of the European pond turtle and amphibians, including especially the European fire-bellied toad, and their habitats in selected Natura 2000 areas in Poland and Denmark

Strenghts	**Weaknesses**
✓ The operational area is environmentally valuable and plays a significant role in the network of protected areas. The presence of protected areas, particularly those under the European Ecological Network Natura 2000, ensures the possibility of environmental supervision and the implementation of certain active conservation measures for amphibians and the European pond turtle. It also increases the potential for securing financial resources for the protection of these animals and their habitats. ✓ The diversity and wide range of	✓ Lack of a unified strategy in Poland and species protection plans for amphibians, including the European fire-bellied toad. ✓ Insufficiently trained specialists among those responsible for environmental protection at various levels of local and state administration, as well as nature protection services. ✓ Lack of full understanding of the need for active environmental protection among individuals involved in environmental protection at various administrative levels.

conservation activities ensure effective protection and high durability of the actions' effects. ✓ In Denmark, the protection of all water bodies larger than 100 m² ensures their durability and functionality. In Poland, within protected areas, such as landscape parks or Natura 2000 areas, the destruction of water reservoirs is prohibited. ✓ All beneficiaries have extensive experience in active environmental protection, including herpetofauna. They possess a qualified team of nature specialists with significant experience in active nature conservation and ecological education activities, and they are capable of effectively securing financial resources for protection and education. ✓ The diversity and wide range of conservation activities ensure effective protection and high durability of the actions' effects.	✓ Insufficient knowledge about the biology and ecology, as well as methods of active protection, of the species covered by the project among local communities, leading to low ecological awareness and often unfriendly attitudes towards nature and conservation actions. ✓ Lack of stable funding for conservation actions concerning amphibians and reptiles.
Opportunities	**Threats**
✓ In Poland, Natura 2000 areas are protected by law. According to Article 33 of the Nature Conservation Act, actions that may significantly negatively impact the conservation objectives of Natura 2000 areas are prohibited. ✓ The development of tourism in the regions covered by the Project in Poland, mainly based on nature and agritourism, will necessitate investing in nature conservation, including the protection of amphibian and European pond turtle habitats. ✓ The Act on Alien Species and the	✓ Very high costs of conducting certain conservation actions (e.g., construction of underpass passages systems for small vertebrates) may pose a significant threat to securing funds for herpetofauna protection. ✓ Intensive road construction development, with little or no consideration for amphibian protection, can reduce the ecological effectiveness of the project, negatively affecting amphibian and reptile populations. ✓ Increased vehicular traffic can

compendium "Methods of Combating Invasive Alien Turtle Species," commissioned by GDOŚ, will allow for more effective control of species threatening the European pond turtle population. ✓ The presence of active environmental NGOs in the areas covered by the Project creates significant opportunities for obtaining substantial financial resources for conservation actions, including the protection of amphibians and the European pond turtle. ✓ The cooperation established between the Warmian-Masurian Voivodeship, the "Man and Nature" Association, the Romincka Forest Foundation, and the Institute of Nature Conservation of the Polish Academy of Sciences in Krakow creates significant opportunities for preparing a project for the LIFE program and continuing actions related to the protection of amphibians and the European pond turtle.	lead to higher mortality rates of amphibians and reptiles on roads. ✓ The emergence of new invasive alien animal species can threaten the habitats of native amphibian and reptile species. ✓ Catastrophic events (e.g., floods caused by high sea levels - relevant to islands in Denmark) can cause significant losses in amphibian populations. ✓ Difficulties in maintaining the ecological effectiveness of the project may change the perception of conservation actions by local communities and limit their support for similar actions.

In the planned actions, both during the durability period of the project and beyond, the priority is to limit or eliminate the weaknesses and threats identified in the above analysis.

The lack of adequate knowledge in society about nature conservation, its importance for various aspects of life, threats, and methods of implementation will be mitigated through intensified educational activities. These efforts will be directed at a wide audience, including professionals involved in nature conservation, such as employees of municipal, county, and city offices. The list of planned informational and educational activities related to biodiversity and its conservation is quite extensive, but a significant portion of these tasks will require external financial support.

A significant threat to the durability of the outcomes achieved in the Project is the increase in vehicular traffic and the intensive development of the road network. While beneficiaries have limited influence over these factors, they will attempt to address them by, for example, submitting requests to investors and authorities issuing environmental impact decisions to consider herpetofauna conservation aspects in the construction or renovation of roads. They will also advocate for the installation of portable or permanent herpetological barriers on road sections where these animals frequently die. Beneficiaries can also highlight the need for herpetofauna protection during the evaluation of environmental impact reports for planned investments. Additionally, they will aim to enhance the monitoring of amphibians and reptiles by incorporating a social aspect, engaging all interested individuals, including school youth, in these efforts.

An unpredictable threat to the species and their habitats covered by the Project could be extreme events, especially those of a catastrophic nature. A good example of this was the situation in Denmark in October 2023. Due to a very strong storm, one of the strongest populations of the European fire-bellied toad in the South Funen Archipelago on the island of Birkholm suffered severe losses as their habitats were flooded by the sea-almost the entire island was submerged. Thanks to the actions carried out within the framework of the Project, the genetic material of part of this population was preserved. The population of the European fire-bellied toad restored on Skarø was derived from the genetic material from the island of Birkholm.

III. Plan objectives and methodology

III.1. Protection priorities

The project was implemented in five Natura 2000 areas: Mazurska Ostoja Żółwia Baranowo PLH280055, Ostoja Piska PLH 280048, Puszcza Romincka PLH280005, Ujście Ilanki PLH090015, and Sydfynske Øhav DK008X201. Four of these areas have approved protection task plans, with the exception of Puszcza Romincka.

The project aimed to improve the unfavorable conservation status of the European pond turtle within three Polish Natura 2000 areas (PLH280055, PLH480055, PLH080015), with one area specifically designated for the protection of this species (PLH280055). Additionally, it sought to improve the unfavorable conservation status of the European fire-bellied toad in four

Polish Natura 2000 areas (PLH280055, PLH480055, PLH280005, PLH080015), as well as in the Natura 2000 site in Denmark (DK 008X201). In all these sites, these species are subjects of protection.

The Protection Task Plan for the Natura 2000 area Mazurska Ostoja Żółwia Baranowo was approved in March 2015. All actions carried out within the project were in accordance with the provisions contained in this document and aimed at: maintaining the conservation status of the species' habitats at the Cudnochy and Kosewo sites; improving the conservation status of the species' habitats at the Faszcze and Nowe Sady sites; and supplementing knowledge regarding the population size and occurrence of the European pond turtle.

The Protection Task Plan for the Natura 2000 area Ostoja Piska was approved in April 2020. According to the provisions contained in this document, one of the threats to the European pond turtle is "Increased vehicular traffic in areas where the European pond turtle occurs." Therefore, the construction of underpass passages for small vertebrates under national road No. 16 aligns with the actions envisioned for this area.

The Protection Task Plan for the Natura 2000 area Ujście Ilanki was approved in April 2014 (with amendments approved in January 2017). One of the threats mentioned in these documents is "*the threat related to the reduction of the species population size due to the mortality of individuals crossing the road no. 1252F, connecting Rybocice and Kunice within the area.*" The planned action involves "*constructing a culvert under the road connecting Młynówka with the canal leading to the Ilanka River, considering the need for species migration.*" The construction of an underpass passages system for small vertebrates under road no. 1252F aligns with the actions planned for this area.

The Protection Task Plan for the Natura 2000 area Sydfynske Øhav (DK008X201) identifies this area as one of the key habitats for the European fire-bellied toad in Denmark. The European fire-bellied toad is a priority species, subject to special actions for endangered species and habitats under the Strategic Conservation Priorities for Natura 2000 Areas in Denmark for the period 2014-2020 (F1). It is also a key species in the action of creating and restoring ponds within *G.1.d. Priority indicators for species and habitats of wetland Natura 2000 areas.* Reducing impacts and adapting to climate change affecting sea level changes are recognized in Denmark as a strategic priority (F3) in managing Natura 2000 areas for protected species and habitats.

Within the South Funen Archipelago in Denmark, the European fire-bellied toad is found on only four islands: Hjortø, Birkholm, Avernakø, and Ærø, but only the populations on Hjortø and Avernakø are native (the others are artificially introduced to preserve the species and its genetic pool in the archipelago). The first three islands are low-lying, and the projected sea level rise in Denmark (average value from 5 IPCC models and data from the Danish Meteorological Institute predict a sea level rise of 0.6-1.2 m over the next 60-80 years) poses a flood risk to the low-lying habitats of the European fire-bellied toad populations. Already in 1995, a large part of the European fire-bellied toad population on Hjortø was lost due to winter flooding with seawater. Thanks to the LIFE project (LIFE99 NAT/DK/006454), it was possible to preserve the genetic material from Hjortø by creating populations on the islands of Birkholm and Ærø. The island of Skarø has extensive areas of higher-lying clayey soils, where restored water bodies will not be threatened by flooding associated with winter high sea levels. Therefore, the island of Skarø was chosen to support the European fire-bellied toad population in the South Funen Archipelago and ensure the preservation of its genetic material. These actions will improve or at least maintain the population of the European fire-bellied toad throughout the Natura 2000 area.

As mentioned earlier, the Natura 2000 area Puszcza Romincka does not yet have a protection task plan, but the existing Puszcza Romincka Landscape Park has a Protection Plan established in December 2006. The actions related to the restoration of water bodies in the Puszcza Romincka area are in line with the nature protection activities of the Park, focusing on the protection of water resources (creating new and restoring disappearing small water bodies).

The authors of some documents did not always have complete information to plan detailed conservation actions. Therefore, in some cases, these actions focus on achieving the appropriate structure and function of the species' habitat, supplementing knowledge about the species, its population status, and planning conservation actions.

According to the provisions in the PAF (Priority Action Framework for the Natura 2000 Network in Poland for 2021–2027), three Natura 2000 areas: Mazurska Ostoja Żółwia Baranowo, Ostoja Piska, and Ujście Ilanki, are aligned with the Main Priority Actions: G.1.a (*E.o.: Active protection of plant and animal species, Restoration of natural habitats through the improvement of water conditions*) and Priority Actions G.1.d (*E.o.: Restoration of natural habitats and species habitats through the improvement of water conditions, Restoration of*

natural habitats through the removal of tree and shrub overgrowth from non-forest areas). The Puszcza Romincka area is aligned with Priority Actions: G.1.d (*B.b.: Improving the conservation status of species populations through the deepening and creation of small ponds and water bodies up to 1.5 m deep and up to 50 ares in size*) and Other Priority Actions: G.2.a (*B.b.: Increasing water retention through the creation of small water bodies*).

Furthermore, the project actions were consistent with the provisions contained in the following documents: "Species Management Plan for North-Eastern Poland. European Pond Turtle *Emys orbicularis*" (Linnaeus 1758). Grzegorz Górecki, Field Station IZ Faculty of Biology UW, Urwitałt, 2009; "Species Management Plan for Natura 2000 areas: Puszcza Piska, Puszcza Napiwodzko-Ramucka. European Pond Turtle *Emys orbicularis* (Linnaeus 1758)". Grzegorz Górecki, Field Station IZ Faculty of Biology UW, Urwitałt, 2009; "National Environmental Monitoring. European Pond Turtle. Species Report at the Site – Cudnochy," Grzegorz Górecki, 2009; "National Environmental Monitoring. European Pond Turtle. Species Report at the Site – Cudnochy," Grzegorz Górecki, 2014; "The Importance of Restored Water Bodies in the Puszcza Romincka Landscape Park for the Local Amphibian Population." Lech Krzysztofiak, 2012; "Management Plan for the European Pond Turtle Population in the Rybocice Area" - developed within the project "Protection of *Emys orbicularis* and amphibians in the North European lowlands" LIFE05NAT/LT/000094. Marek Maciantowicz, 2009; "Management Plan for the European Pond Turtle Population *Emys orbicularis* (Linnaeus 1758) in the Natura 2000 areas: Mazurska Ostoja Żółwia Baranowo, Puszcza Napiwodzko Ramucka and part of the Puszcza Piska refuge." Grzegorz Górecki, Field Station IZ Faculty of Biology University of Warsaw, Urwitałt, 2015; "Hydrological Analysis of the Partial Catchment of Lake Jorzec." Environmental Project Office, 2016.

III.2. Protection needs

The conservation actions included in the completed Project well reflect the needs of the individual species covered by the Project. Taking into account the provisions contained in the Protection Task Plans for the respective Natura 2000 areas and other documents (see above), the main methods for eliminating or reducing threats to herpetofauna and their effects include:

- restoring or constructing water reservoirs as breeding sites for amphibians and habitats for the European pond turtle;

- protecting European pond turtle nests from predators;
- actively countering succession by mowing herbaceous vegetation and cutting down tree and shrub growths in the breeding areas of the European pond turtle;
- considering animal migration issues in environmental impact assessments of investments, including alternative solutions that minimize the impact of habitat fragmentation and ensure the continuity of natural spaces necessary for the functioning of ecological corridors;
- efforts to introduce land use principles in feeding areas and designated ecological corridors that consider animal migration needs;
- preserving and constructing new hibernation sites for amphibians and summer shelters for these animals;
- promoting and constructing underpass passages (culverts) for small vertebrates, including the European pond turtle, in places where the mortality of these animals due to vehicle collisions has been recorded;
- organizing amphibian protection campaigns during their breeding migrations: setting up fences, transporting amphibians across roads, etc.;
- removing invasive alien animal species that threaten native amphibian and reptile species;
- conducting ecological education among the local community about the biology, ecology, significance, and methods of protecting herpetofauna, including the European fire-bellied toad and the European pond turtle.

The condition for undertaking these actions is a detailed understanding of the needs of individual species or groups of species and the habitats in which they live. Therefore, it is essential to conduct continuous environmental monitoring, providing the necessary information to plan conservation actions. Particularly important is the identification and determination of ways to eliminate or reduce existing and potential internal and external threats and their effects to maintain the proper conservation status of the species and their habitats.

Simultaneously, educational activities should be conducted among both children and school youth, as well as adults. This element of activity is very important for raising and reinforcing the positive attitude of local communities towards the conservation actions undertaken.

IV. Activities to maintain project results after its completion

Some actions carried out as part of the Project will continue after its completion. These actions are necessary to maintain the Project's results. Table 1 provides a description of these actions along with the entities responsible for their implementation.

Table 1. Project activities and their follow-up

Action	Need for follow-up	Entity responsible	Source of financing
A.1. Preparation of sites for protective measures	**NO.** In the coming years, beneficiaries do not foresee conducting eDNA research to detect the presence of the European pond turtle or continuing the breeding of the European fire-bellied toad on Skarø.	-	-
A.2. Preparation of documentation for technical activities related to water management	**NO.** In the coming years, beneficiaries do not foresee the construction of facilities or activities requiring water management documentation.	-	-
A.3. Preparation of tender documentation and supervision of the procedure	**NO.** Action completed.	-	-
C.1. Construction of a water dam on plot 14/1 in Nowe Sady	**YES.** Although no further dam construction is planned in the coming years, maintenance work to keep the existing water dam in good technical condition (repairs, cleaning) will be conducted.	"Man and Nature" Association	WFOŚiGW in Olsztyn, own resources and personnel of the beneficiary
C.2. Construction of three systems of underpass passages for small vertebrate animals	**YES.** Beneficiaries plan to build additional underpass passages systems for small vertebrates as part of the currently prepared application to the LIFE Program and NFOŚiGW. Maintenance work will be conducted on the existing passages systems to keep the infrastructure in good technical condition (repairs, cleaning), and herpetological fences will be installed in Prawdowo during the season to seal the underpass passages system between its two sections.	Warmian-Masurian Voivodeship, "Man and Nature" Association	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn, FEnIKS Program, Re:Generacja Program, own resources and personnel of the responsible entities
C.3. Revitalization of water reservoirs and construction of hibernation sites for amphibians	**YES.** Beneficiaries plan to restore water reservoirs and build amphibian hibernation sites as part of the currently prepared application to the LIFE Program	Warmian-Masurian Voivodeship, Municipality of Svendborg	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn, FEnIKS Program, Re:Generacja Program, own

	and NFOŚiGW. Maintenance work will be conducted on the restored water reservoirs and built hibernation sites to keep them in good technical condition (repairs, cleaning). In Denmark, as part of a new LIFE project submitted in response to the September 2023 call, 10 hectares of arable land on Skarø will be converted to increase the area of terrestrial habitats for the European fire-bellied toad.		resources and personnel of the beneficiary
C.4. Protection of the European pond turtles' habitat	**YES.** Beneficiaries plan further actions to enlarge and maintain European pond turtle breeding habitats as part of the currently prepared application to the LIFE Program and NFOŚiGW. Maintenance work will continue on the restored European pond turtle breeding site to keep it in good condition (mowing, removing tree and shrub growth) and protect the breeding (securing the nest with an electric shepherd).	"Man and Nature" Association	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn, FEnIKS Program, Re:Generacja Program, own resources and personnel of the beneficiary
C.5. Restoration of populations of protected species – fire-bellied toad	**NO.** In the coming years, beneficiaries do not foresee further work related to collecting eggs and breeding the European fire-bellied toad.	-	-
D.1. Monitoring of *Emys orbicularis* population – use of passageways, presence in breeding grounds, presence in reconstituted habitats	**YES.** Monitoring of the effectiveness of conservation actions targeting the European pond turtle will continue (monitoring the use of passages, presence of individuals at breeding sites, and effectiveness of nest protection).	"Man and Nature" Association	WFOŚiGW in Olsztyn and Zielona Góra, own resources and personnel of the beneficiary
D.2. Monitoring of amphibians population in recreated water reservoirs and hibernation sites	**YES.** Monitoring of the effectiveness of conservation actions targeting amphibians will continue (monitoring the presence of amphibians in restored water reservoirs and built hibernaton sites).	"Man and Nature" Association, Miljøstyrelsen – NOVANA Monitoring Program	WFOŚiGW in Olsztyn, National Monitoring System for the European Fire-bellied Toad in Denmark (NOVANA), own resources and personnel of the beneficiaries
D.3. Assessment of the socio-economic impact of the project	**NO.** Action completed.	-	-
D.4. Assessment of the impact of the project on ecosystem services	**NO.** Action completed.	-	-
D.5. Monitoring of project	**NO.** Action completed.	-	-

indicators (KPIs)			
E.1. Information materials on the project and protection of amphibians and reptiles	**YES.** Beneficiaries plan to prepare and publish informational and educational materials about herpetofauna as part of the currently prepared application to the LIFE Program and NFOŚiGW. Materials remaining from this Project will be gradually used during educational meetings.	"Man and Nature" Association	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn
E.2. Development and maintenance of the website of the project	**YES.** The Project website and information about the Project on the Amphi International website in Denmark will be maintained for at least 5 years after the Project's completion.	Warmian-Masurian Voivodeship, "Man and Nature" Association, Amphi International ApS	Own resources and personnel of the beneficiaries
E.3. Organization of an international conference on active protection of amphibians and reptiles	**YES.** Another conference is planned as part of the currently prepared application to the LIFE Program and NFOŚiGW.	Warmian-Masurian Voivodeship	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn
E.4. Development and installation of boards/information signs	**NO.** Action completed. No new boards are planned.	-	-
E.5. Educational meetings	**YES.** Annual educational activities on herpetofauna conservation (meetings, lectures, workshops) are planned. At least 15 such meetings are planned for 2024-2028. Additionally, beneficiaries plan to prepare educational activities as part of the currently prepared application to the LIFE Program and NFOŚiGW.	"Man and Nature" Association, Warmian-Masurian Voivodeship	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn and Białystok, own resources and personnel of the beneficiaries
E.6. Networking with other LIFE projects or with other projects	**YES.** Collaboration with beneficiaries of other projects, including those funded by the LIFE Program, is planned. Participation in conferences, symposia, and seminars where results of the LIFE17 NAT/PL/000011 project will be presented is planned. Information about the completed Project and its results will be presented at meetings with the so-called Green Council of the Municipality of Svendborg - an advisory and consultative body consisting of 18 stakeholder organizations.	"Man and Nature" Association, Warmian-Masurian Voivodeship, Municipality of Svendborg	LIFE, NFOŚiGW, WFOŚiGW in Olsztyn, own resources and personnel of the responsible organizations

NFOŚiGW *- The National Fund for Environmental Protection and Water Management is a national-level financial institution that serves as the main pillar of Poland's system for financing environmental protection and water management;* ***WFOŚiGW*** *- The Provincial Fund for Environmental Protection and Water Management is*

a regional-level financial institution aimed at supporting activities for environmental protection and water management within the provinces; ***Program LIFE*** *- a European Union initiative designed to finance projects related to environmental protection, including nature conservation, climate impact, and adaptation to climate change;* ***Program FEnIKS*** *- The European Funds for Infrastructure, Climate, and Environment program aims to strengthen the protection of biodiversity and natural ecosystems;* ***Program Re:Generacja*** *- a nationwide initiative aligned with the goals of the UN Decade on Ecosystem Restoration. It involves financial (and sometimes personal) support from various companies for conservation activities in valuable ecosystems.*

Action C.1. Construction of a water dam on plot 14/1 in Nowe Sady – the action has been completed, but maintenance work will be conducted to keep the existing dam in good technical condition (repairs, cleaning). Generally, it is anticipated that this action will be repeated annually (removing excess vegetation or other elements obstructing the free flow of water) or as needed for repairs. The scope and timing of these actions are difficult to predict. Similarly, the cost of the action is hard to estimate accurately, but it is assumed that the annual cleaning of the dam (including transport and equipment use) will not exceed EUR 340.

Action C.2. Construction of three systems of underpass passages for small vertebrate animals – during the durability period of the Project, the beneficiaries (Warmian-Masurian Voivodeship and "Man and Nature" Association) will ensure the proper technical condition of the underpass systems. This includes making necessary repairs, maintaining tunnel clearance, and removing high vegetation around guiding barriers as needed. The costs related to maintaining the constructed systems are difficult to estimate as they will depend on repair needs. However, it is estimated that the annual cost for cleaning the tunnels, gutters, and removing excess vegetation will require between EUR 1,000-2,000. Additionally, the Warmian-Masurian Voivodeship will bear the costs (approximately EUR 900 per year) of insuring the underpass systems in Prawdowo and Kosowo. All necessary work will be carried out by the beneficiaries themselves using financial resources from the WFOŚiGW in Olsztyn and Zielona Góra, as well as the Re:Generacja Program.

There are also plans to construct underpasses for amphibians as part of a new project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". This project plans to build two systems of underpass passages for amphibians: one on the county road near Krutyń, 400 meters long (Ostoja Piska PLH280048), and one on Kodeksu Supraskiego Street and

Rymarka Street in Supraśl, 400 meters long (Ostoja Knyszyńska PLH200006). The cost of building the underpass system in Supraśl (6 tunnels, 800 meters of herpetological barriers, and 32 meters of stop-grids) is estimated at over EUR 766,000, while in Krutyń (5 tunnels, 800 meters of herpetological barriers, and 22 meters of stop-grids) it is estimated at over EUR 580,000.

Additionally, the new project plans to seal the existing underpass systems for the European pond turtle in Prawdowo by adding herpetological barriers between the two sections of barriers, totaling 200 meters. The cost of this action is estimated at EUR 96,500. Until this action is implemented under the new project, portable herpetological fences will be installed seasonally on this section.

Action C.3. Revitalization of water reservoirs and construction of hibernation sites for amphibians – during the durability period of the Project, the Warmian-Masurian Voivodeship and the Municipality of Svendborg will ensure the proper technical condition of the reservoirs and hibernation sites. Maintenance work will be conducted as needed to keep them in good condition (repairs of hibernation sites, cleaning reservoirs from excess vegetation). The costs related to maintaining the reservoirs and hibernation sites are difficult to estimate as they will depend on repair and cleaning needs. However, it is estimated that during the Project's durabiluty period, at least EUR 1,200-2,200 will be needed annually. In Poland, all necessary work will be carried out by the beneficiaries themselves using financial resources from the WFOŚiGW in Olsztyn and Zielona Góra, as well as the Re:Generacja Program.

In Denmark, actions will be carried out by the Municipality of Svendborg, responsible for conservation activities in the Natura 2000 area Sydfynske Øhav, including Skarø. Based on past experiences, it is anticipated that water reservoirs will require maintenance no earlier than 10 years after revitalization. If such maintenance is needed, the Municipality of Svendborg will perform it using its own or acquired funds.

It is not expected that the hibernation sites will require intervention. All restored and constructed water reservoirs in Denmark are automatically protected by law under the Nature Conservation Act, which protects water bodies larger than 100 m^2.

It has been agreed with the municipality that the Project actions will be included in the currently prepared Action Plan for the Natura 2000 area Sydfynske Øhav 2022-2027, which will be published no later than July 3, 2024.

Additionally, the Municipality of Svendborg planned under a new LIFE project, submitted in response to the September 2023 call, to convert 10 hectares of arable land on Skarø to increase the area of terrestrial habitats for the European fire-bellied toad.

There are also plans to restore over 80 water reservoirs for amphibians (each 300-500 m^2) and construct 8 hibernation sites for amphibians as part of a new project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". The estimated cost of these actions is: hibernation sites – over EUR 51,000; water reservoirs - approximately EUR 540,500.

Action C.4. Protection of the European pond turtles' habitat – during the durability period of the Project, the beneficiary ("Man and Nature" Association) will conduct work to maintain the breeding site in good condition (mowing, removing tree and shrub growth) and protect the European pond turtle nests (securing the breeding site with an electric shepherd). This work will be performed annually, twice per season. Mowing and removal of tree and shrub growth will be carried out on the turtle breeding site in Cudnochy and its immediate surroundings, covering a total area of 2.4 hectares. The direct breeding site (1.26 hectares) will be protected using an electric shepherd, which will be installed before the turtle egg-laying period (mid-April) and then dismantled for the winter period (November). The estimated annual cost of these actions is EUR 11,500. All necessary work will be carried out by the beneficiary's own forces and using financial resources from WFOŚiGW in Olsztyn and the Re:Generacja Program.

As part of a new project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled " Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe", actions are planned to expand the breeding area in Cudnochy by at least 2.5 hectares. This will involve purchasing parts of the plots, deforesting the former nesting area currently overgrown with pine forest, and preparing it for the needs of the European pond turtle. The estimated cost of this action (excluding land purchase) is approximately EUR 240,000. The project also plans annual mowing of the new breeding area and its immediate surroundings, and protecting the turtle nests from predators using an electric shepherd. Until the purchase of agricultural land (approximately 1 hectare) adjacent to the breeding site and its protection against destruction of turtle egg deposits, work will be conducted to excavate found egg deposits and complete their incubation artificially. The annual cost of these actions is estimated at approximately EUR 5,000.

Action D.1. Monitoring of *Emys orbicularis* population - use of passageways, presence in breeding grounds, presence in reconstituted habitats – the actions are related to the continuation of monitoring the ecological effects of conservation activities conducted within the Project. The indicators of this monitoring will include: the degree of use of underpass passages by the European pond turtle, turtle mortality rates on road sections where underpass systems have been constructed, the number of individuals appearing at the breeding site, and the effectiveness of nest protection from predators. Monitoring will be conducted cyclically, using camera traps and direct observations. The action will be funded by financial resources from WFOŚiGW in Olsztyn (monitoring of underpass systems in Prawdowo and Kosewo) and WFOŚiGW in Zielona Góra (Rybocice), as well as the beneficiary's own financial resources and personnel. The estimated cost of conducting the full range of monitoring during the season is EUR 2,300.

Action D.2. Monitoring of amphibians population in recreated water reservoirs and hibernation sites – the actions are related to the continuation of monitoring the ecological effects of conservation activities conducted within the Project. The indicators of this monitoring will include: (i) the degree of use of water reservoirs, recreated/built within the Project, as breeding/living sites for amphibians, with particular emphasis on the European fire-bellied toad, and (ii) the degree of use of hibernation sites by amphibians. This monitoring in Poland will be conducted by the "Man and Nature" Association, and in Denmark by contractors commissioned by Miljøstyrelsen as part of the National Monitoring System for the European Fire-bellied Toad (NOVANA Program, https://novana.au.dk/om-novanaaudk). In Denmark, the action will not include the use of hibernation sites. In Poland, the action will be funded by financial resources from WFOŚiGW in Olsztyn and the beneficiary's own financial resources and personnel, and in Denmark by financial resources from the National Monitoring System for the European Fire-bellied Toad. The estimated cost of conducting the full range of monitoring during one season should not exceed EUR 3,500.

Action E.1. Information materials on the project and protection of amphibians and reptiles – the beneficiaries do not plan to reissue the materials developed within the Project. The informational and educational materials that remain after the Project's completion (educational packages, Project folder) will be used in activities promoting the Project and its results (e.g., during the annual LIFE Information Day organized by NFOŚiGW) and at educational meetings. Similar materials on herpetofauna issues are planned to be published as part of

a new project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". The estimated cost of this action is initially calculated at EUR 16,000.

Action E.2. Development and maintenance of the website of the project – the action will be funded by the financial resources and personnel of the beneficiary (Warmian-Masurian Voivodeship). It is planned to maintain the website for at least 5 years. The estimated cost of this action is initially calculated at EUR 700. Information about the project posted on the Danish Amphi International ApS website will also be maintained.

Action E.3. Organization of an international conference on active protection of amphibians and reptiles – it is planned to organize a three-day international conference dedicated to the issues of herpetofauna protection as part of a new project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". The estimated cost of this action is initially calculated at EUR 22,000.

Action E.5. Educational meetings – the action will be continued cyclically by the beneficiaries (Warmian-Masurian Voivodeship, "Man and Nature" Association) in cooperation with Wigry National Park, Puszcza Romincka Landscape Park, and the Puszcza Romincka Foundation. During the durability period of the Project, at least 15 meetings are planned. The estimated cost of organizing these meetings is over EUR 4,000. Additionally, the beneficiaries plan to prepare new educational activities as part of the project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". The estimated cost of this action is calculated at EUR 7,000.

Action E.6. Networking with other LIFE projects or with other projects – it is planned to maintain cooperation with beneficiaries of other projects, including those funded by the LIFE Program, and to participate in conferences, symposia, and seminars where the results of the LIFE17 NAT/PL/000011 project will be presented. Additionally, the exchange of information between LIFE project beneficiaries and participation in conferences, workshops, and seminars on herpetofauna protection is planned as part of the project to be submitted in 2024 to the LIFE Program and NFOŚiGW titled "Comprehensive protection of herpetofauna in Natura 2000 areas in north-eastern Europe". The estimated cost of this action is initially calculated at EUR 54,000.

Information about the completed project and its results will be presented by the Municipality of Svendborg at meetings with the so-called Green Council (Grøn Råd) of the Municipality of Svendborg, an advisory and consultative body consisting of 18 stakeholder organizations (https://www.svendborg.dk/om-politik/andre-udvalg-raad-og-naevn/raad-2022-2025#bootstrap-panel).

Activities promoting the Project and its results. These actions will involve both presenting the Project results at various events (conferences, symposia, seminars, workshops) and including information about the Project in materials related to the continuation of selected activities. The results obtained during the implementation of actions concerning amphibian hibernation sites will be used to develop new solutions in this area, increasing their effectiveness.

Beneficiaries anticipate participating in at least 5-8 conferences, symposia, or seminars during the Project's durability period, where they will present the Project results. The cost of these actions will be covered by the beneficiaries' own financial resources and personnel.

Expected costs of activities maintaining the Project results in 2024

In 2024, the following actions are expected to continue: C.1. Construction of a water dam on plot 14/1 in Nowe Sady, C.2. Construction of three systems of underpass passages for small vertebrate animals, C.3. Revitalization of water reservoirs and construction of hibernation sites for amphibians, C.4. Protection of the European pond turtles' habitat, D.1. Monitoring of Emys orbicularis population - use of underpasses, presence at nesting sites, presence in restored habitats, D.2. Monitoring of amphibians population in recreated water reservoirs and hibernation site, E.2. Development and maintenance of the project website, E.5. Educational meetings, E.6. Networking with other LIFE projects or with other projects.

C.1. Construction of a water dam on plot 14/1 in Nowe Sady - a technical condition check of the dam and the removal of vegetation from the dam surface (if necessary) are planned; the cost of these procedures is estimated at EUR 340 and will be covered by own financial resources.

C.2. Construction of three systems of underpass passages for small vertebrate animals - a technical inspection of all underpass systems, cleaning them of sand and vegetation (if necessary), and installing portable herpetological fences to

seal the gap between the two sections of underpasses in Prawdowo are planned. The costs associated with these procedures should not exceed EUR 1,200 and will be covered by own financial resources.

C.4. Protection of the European pond turtles' habitat - it is planned to mow and remove tree and shrub growth twice a year on the breeding site in Cudnochy and its immediate surroundings, and to secure the breeding site with an electric shepherd. The total cost of carrying out this procedure will not exceed EUR 11,500. Financial resources for this purpose will be obtained from the Re:Generacja Program.

D.1. Monitoring of *Emys orbicularis* population - use of passageways, presence in breeding grounds, presence in reconstituted habitats - it is planned to monitor the degree of use of the underpasses built in the Project by the European pond turtle (using camera traps) and the effectiveness of nest protection from predators at the breeding site in Cudnochy (using camera traps and direct observations). The total cost of conducting this monitoring will not exceed EUR 2,300. The costs will be covered by the beneficiary's own financial resources.

D.2. Monitoring of amphibians population in recreated water reservoirs and hibernation sites - it is planned to monitor the degree of use of the water reservoirs recreated/built in the Project by amphibians, especially the European fire-bellied toad. The total cost of conducting this monitoring will not exceed EUR 3,500. The costs will be covered by the beneficiaries' own financial resources and the National Monitoring System for the European Fire-bellied Toad in Denmark.

E.2. Development and maintenance of the website of the project - it is planned to maintain the Project's website and enrich it with information about the Project's completion, participation in events where the Project results were promoted, and information from continued actions aimed at maintaining the ecological effects of the conservation measures undertaken. The cost of the action, amounting to approximately EUR 140, will be covered by the beneficiary's own financial resources and personnel.

E.5. Educational meetings - it is planned to organize at least two educational meetings on topics related to amphibians and the European pond turtle. The cost of conducting the meetings will exceed EUR 500 and will be covered by the beneficiaries' own financial resources.

The total cost of the actions planned for 2024 amounts to EUR 19,280, of which at least EUR 12,500 will come from external sources. Some actions will be

carried out using the beneficiaries' own personnel, while others will be financed from the beneficiaries' own funds.

Long-term goals and indicators for their monitoring

1. Ensuring the technical durability of three underpass systems for small vertebrate animals.

2. Ensuring the technical and functional durability of the water reservoirs and hibernation sites for amphibians built within the Project.

3. Maintaining the European pond turtle breeding site in Cudnochy in good condition and securing the turtle egg deposits.

4. Continuing educational activities and promoting the results achieved through the implementation of the Project.

Action	Indicator name	Data source
C.2. Construction of three systems of underpass passages for small vertebrate animals	Number of dead European pond turtles recorded on road sections secured with permanent herpetological barriers throughout the year	Monitoring reports conducted by beneficiaries
C.3. Revitalization of water reservoirs and construction of hibernation sites for amphibians	Number of water reservoirs (recreated/built within the Project) used by amphibians, including the European fire-bellied toad, as breeding sites Number of species and individuals of amphibians using the hibernation sites built within the Project	Monitoring reports conducted by responsible organizations
C.4. Protection of the European pond turtles' habitat	Number of European pond turtles recorded at the breeding site in Cudnochy Number of European pond turtle nests destroyed by predators at the breeding site in Cudnochy	Monitoring reports conducted by the beneficiary
E.5. Educational meetings	Number of people covered by educational activities on herpetofauna protection	Annual activity analyses conducted by beneficiaries

V. Summary

The implementation of the project titled "*Active protection of rare amphibian and reptile species in the Natura 2000 sites in Europe*" contributed to

the improvement of the conservation status of the European pond turtle (*Emys orbicularis*) and the European fire-bellied toad (*Bombina bombina*) in five Natura 2000 sites in Poland (Mazurska Ostoja Żółwia Baranowo PLH280055, Ostoja Piska PLH280048, Puszcza Romincka PLH280005, Ujście Ilanki PLH090015) and in Denmark (Sydfynske Øhav DK008X201). Some of the actions were a continuation of conservation efforts carried out by the beneficiaries for many years, while others were implemented for the first time. Part of these actions will be continued in the coming years, ensuring the maintenance of the ecological effect achieved within the Project.

The results obtained significantly confirmed the effectiveness of the conservation measures undertaken, allowed for their detailed analysis, and helped in developing the most effective methods of action. The Project's results provide a basis for a broad discussion on the most effective ways to protect herpetofauna. They also encourage the undertaking of further projects where these actions will be applied, expanded, and subjected to detailed analysis of their effectiveness.

The Project provided essential information on the active protection of amphibians, particularly the European fire-bellied toad and the European pond turtle. The results obtained from monitoring the effectiveness of the permanent underpass systems for small vertebrates confirmed that they are also highly significant for the European pond turtle. Therefore, it is worthwhile to build underpasses for these animals, ensuring that the locations of the culverts are correctly designated.

A very important element of the Project was the development of an effective method for protecting the nests of the European pond turtle from predators. The method of protecting the breeding site using an appropriately adapted electric shepherd proved to be highly effective – during the period of the fence's operation, no nest destruction was recorded. Further monitoring of this method's effectiveness in the Project area will allow for an even more thorough evaluation.

Once again, the effectiveness of active amphibian conservation through the restoration/construction of small water reservoirs as breeding and living sites for these animals was confirmed. Nearly all restored reservoirs were quickly inhabited by amphibians.

The results of monitoring the effectiveness of the constructed hibernation sites for amphibians did not produce clear results, indicating the need to verify existing knowledge on the subject and propose new, more effective solutions.

Active protection of the European fire-bellied toad through the creation of mirror populations is one method of increasing this species' population and preserving its genetic material. The actions in this regard, carried out within the Project, confirmed its effectiveness – from 4,100 collected toad eggs, approximately 3,900 young individuals were raised and released into new water reservoirs. The validity of such actions was confirmed by events that took place in October 2023 on the island of Birkholm in Denmark (from where the toad eggs were collected for breeding). A very strong storm, which resulted in a significant part of the island being flooded, drastically reduced the size of the European fire-bellied toad population.

An essential element of the Project was monitoring the ecological effects of conservation activities. The methods used proved highly effective and are worth applying in similar actions. This is especially true for monitoring with camera traps to assess the effectiveness of underpasses for small vertebrates, the presence of European pond turtles at breeding sites, and the effectiveness of protecting their nests. Using a drone with a camera to record the presence of turtles is also a very effective method.

The results of all other actions also confirmed their usefulness in protecting the species and habitats covered by the Project. Therefore, as needed and feasible, these methods should be applied in further efforts to protect amphibians, the European pond turtle, and their habitats.

The effectiveness of all conservation activities is largely dependent on the ecological awareness of local communities. Shaping the right attitudes towards nature in society is an extremely important task. All educational activities should therefore be continued and targeted at various groups (farmers, foresters, nature protection services, teachers, etc.).

The results obtained in the Project and the further actions planned after its completion will significantly contribute to the protection of amphibian and European pond turtle populations and their habitats. An important element of these efforts will be the continued promotion of the Project's results and making them available to all interested individuals and institutions.