

## The Rufford Foundation

### Final Report

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Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in word format and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to [jane@rufford.org](mailto:jane@rufford.org).

Thank you for your help.

Josh Cole, Grants Director

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#### Grant Recipient Details

Your name	Oksana Abduloieva
Project title	Implementation of the measures to restore and manage natural habitats in the national nature park “Pyriatynskyi” (Central Ukraine)
RSG reference	19209-2
Reporting period	01.02.2016 - 01.08.2017
Amount of grant	£4998
Your email address	<a href="mailto:oksana_abduloieva@univ.kiev.ua">oksana_abduloieva@univ.kiev.ua</a>
Date of this report	17.12.2017

**1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
1. To apply winter harvesting of common reed as sustainable practice that supports the diversity of habitats on the floodplain. To assess primary effects of this practice, on the one hand, and of burning, on the other. To arrange contacts with communities and local authorities in order to diminish the practice to burn old grass and dead wood.				<p>We could not implement a large-scale winter harvesting of common reed in wetlands, namely, mowing long bands of 50 m in width. The only available approach was to mow few small plots of 100 m<sup>2</sup>. Main causes: 1) there were increased technical difficulties to perform this without machinery larger than a gasoline engine scythe, so the park staff did not support the idea to contribute to this; 2) lack of stakeholders who would take the resulted plant mass for recycling.</p> <p>Small-scale experimental winter mowing, analysis of impact of fires and educational work with local communities make us closer to achieve this objective.</p>
2. To implement plan of measures for restoration of native oak stands as the first step to restore woodland habitats, to helping nature restore forests, to return habitats for vulnerable animals and plants, to link woodland fragments. We intend to seed native oak ( <i>Quercus robur</i> ) and support its regeneration (in woodlines, on the sites selected through landscape planning and on those occupied with invasive weeds).				<p>On the area of 3 ha we planted oak acorns and linden drupes. Landscape features of the site are appropriate for the endangered type of woodlands (G1.A1, according to Resolution 4 of Bern Convention) that is native for oak and other deciduous tree stands. We take care of plantings together with staff of the park.</p>
3. To implement actions for conservation and increasing populations of				<p>In general we arranged 50 artificial nests for bumblebees, 64 for wild species of wasps and bees, 56 for</p>

<p>vulnerable species associated with wetlands and woodlands: Hymenoptera insects (bumblebees, wasps, <i>Xylocopa violacea</i>), birds (owls, tits), plants (spring ephemeroid herbs).</p>			<p>vulnerable bee species (<i>Xylocopa violacea</i>), and three "hotels for insects". Not all of them were immediately occupied, this fact in particular relates to bumblebees and owls. Possible causes of this may be low actual diversity and very low density of populations in wild conditions and indirect human-made impact. The most promising constructions for the future are "hotels for insects": they are occupied by different wild wasps and bees in a year and people really like them. Starting from 2016 we disseminate diaspores of vulnerable plants (<i>Pulsatilla patens</i>, <i>Galanthus nivalis</i> and other accompanying in-early-spring-flowering plants) in two sites of appropriate woodlands. If forest litter is removed, those species can demonstrate quite good germination. We were faced with the problem that artificial nests had not been occupied by owls.</p>
<p>4. To support "close-to-natural" practices for habitats and populations restoration.</p>			<p>To restore native oak stands we analyse local landscape features and how suitable they are for that. We plant oak trees from acorns, not from transplanted seedlings. Our artificial nests for insects are made of natural materials (fresh and rotten wood, reed and straw, clay), according to biological requirements of wild species, and fit in harmony with surrounding environment.</p>
<p>5. To educate local communities and, in particular, young people on restoration and management of natural habitats, train and encourage them planting native oak stands, maintaining the cavity-nesting birds. To create an</p>			<p>Both volunteers and schoolchildren were involved in all kinds of our activities. All the taken events (their purposes, location, outcomes) were elucidated for regional community in news media, in Facebook, on local workshops and two regional environmental conferences (2016, 2017) as well.</p>

initiative where the regional public purposes, related to wildlife and the national nature park, could be realized.				
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**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

1. Large-scale reed mowing. We could not apply winter harvesting of common reed (*Phragmites australis*) in wetlands in such a scale as we expected by mowing large lines of 50 m in width on at least several hectares of wetlands. It was found very difficult to arrange this by our own efforts and involving staff of the park.

We changed our approach and mowed 10 small plots of 100 m<sup>2</sup>. Small-scale experimental winter mowing, chemical analysis and analysis of impact of fires make us closer to estimate plant mass stock for bio-resources, chemical and biological consequences of its mowing or burning in fires on environment in wetlands. In future we have to consider and find the way how to arrange winter mowing so that the park could complete it before a deep snow cover accumulates, and could take the mowed reed away from wetlands. We have to find stakeholders in the region who could take the harvested plant mass for recycling.

2. Artificial nests for owls. Artificial nests for owls, which had been intended to increase the density of populations, were found to be empty or colonised by squirrels. We are looking for new ways to attract target species.

**3. Briefly describe the three most important outcomes of your project.**

**1. Measures for management and restoration of target natural habitats and landscapes. Guidelines on management of floodplains in order to improve biodiversity conservation.**

1.1. We compiled guidelines for nature management in target habitats – reed wetlands and deciduous woodlands. The guidelines are to be implemented for next 5 years in the national nature park. Full version of guidelines is included in the chronicle of the park, while its short version is published in a brochure available for local communities.

Here are our main research results relating to the contribution of reed wetlands to the healthy environment on river floodplains:

1.1.1 We mowed 10 experimental plots, each of size 100 m<sup>2</sup>, in reedbeds, in December-February. Estimated yield of reed mass is 4-16 ton ha<sup>-1</sup>. Results of chemical tests reveal features of chemical cycles in reed wetlands if one applies practices of either burning or mowing.

In particular, water content in air dried mass of winter reed is 6-9%, raw fibre (cellulose, lignin and acid-non-soluble compounds that can slowly decompose) -

33.5-37.0%, carbon content approximates to those in wood. Also we got values for nutrient elements (N  $1.50 \pm 0.20$ , P  $0.14 \pm 0.02$ , S  $0.95 \pm 0.05\%$ ) and ash minerals. Experimental burning of the harvested reed provides us with another evidence like amount of ash and its minerals that fall into soils after the fire: 100 kg of winter reed after it has been burned provide 5.5-7.5 kg of char ash (which is 4-17 times more than from wood), 1.4-1.8 kg of nitrogen, about 1 kg of sulphur, 115-165 g of phosphorus. If to burn a medium-yielding reed community, then 250-410 kg of ash is deposited on 1 hectare of wetland; in high-yielding communities the amount of ash can reach up to 1000 kg ha<sup>-1</sup>. After ash having been washed away into fresh water, the pH-reaction of water changes for a while to alkaline, to 9.5-10.1.

Thus, mowing may remove sufficient stock of nutrients from wetlands, while burning of old grass, on the contrary, returns all nutrients in the form of soluble compounds into the environment of floodplains and the river. Also those tests provide us with data required for recycling of plant mass for biofuel, like calorific properties, acid gas emissions and ash.

1.1.2 During the year, under actual environmental conditions in reed wetlands we arrange birdwatching. Low diversity of habitats in reeds without mowing and under frequent burning may cause low diversity of birds. In the breeding period, the highest value of richness per a single reed habitat was 42 species from 33 genera, 22 families, 10 orders, while the lowest value was 19 species from 15 genera, 10 families, and four orders. In particular, haymaking on floodplain causes regression of reeds and emergence of meadows, thus it may increase bird species richness in twice, comparing to vast areas of reedbeds. Nevertheless, in the surveyed areas of reed wetlands there were recorded six species of birds requiring special nature conservation measures, in accordance with Resolution 6 of Bern Convention, as well as the Birds Directive (2009/147 / EC Of The European Parliament And Of The Council of 30 November 2009 on the Conservation of Wild Birds): *Ciconia ciconia*, *Circus aeruginosus*, *Chlidonias niger*, *Lanius collurio*, *Luscinia svecica*, *Pernis apivorus*. Thus, reed wetlands are the habitats that require a special nature conservation management and should be elements of the Emerald network.



To increase our research capacity and to attract local young people to nature conservation, we install a bird-watching tower. On the date of final report it is still under construction (coordinates N 50.204245°, E 32.636743°).

Left: Layout of a birdwatching tower. Right: A tower under construction, on October 2017

The obtained evidence allow us to make some conclusions about the chemical and biological impact of opposite practices (strict protection, mowing and burning) in reed wetlands. Yearly burning of reedbeds causes temporal alkaline pH reaction in water, strong pollution of the river by ash and nutrients and eutrophication, it unpredictably effects peat deposits and decreases species richness in wetlands.

1.1.3 We hold workshops with nature protection inspectors (rangers) of the national nature park on the question of winter harvesting of common reed as a way of nature management.

The obtained results approximate us to a large-scale nature management in wetlands.

1.2. We helped the national nature park to establish an initiative on restoration of woodlands in the region. A first land site of 3 ha (two edge points: N 50.398252°, E 32.328449° ; N 50.396134°, E 32.332533°) is planted by oak acorns (*Quercus robur*). Field expeditions allowed us to detect and inspect places where natural regeneration of oak takes place, as well as places where large old trees occur. Guidelines for reintroduction of oak in natural woodlands are also elucidated in the brochure available for local community, and in the Chronicle of the national nature park (in the form of the Plan of activities).

## **2. Activities for conservation of vulnerable species and restoration of their populations.**

### **2.1. Artificial nests**

To conserve wild populations of bumblebees, we installed 50 artificial nests in 2016-2017, in different habitats. Unfortunately, so far the nests are not occupied, except for wasps of *Polistes* genus, hornets (*Vespa crabro*) and ants. To conserve populations of wild wasps and bees, we installed 64 nests made of reed culms (*Phragmites australis*), branches of black elder (*Sambucus nigra*) and red raspberry (*Rubus idaeus*). Target habitats were reedbeds, woodlands and outskirts of villages. Average occupancy rate was around 14%. Observed insect richness comprises 44 species from 11 families. Occupancy and species richness greatly vary depending on a year. The nests allowed us to record a species *Discoelius zonalis* (family Vespidae). It is included in the national red list and it is its first record in the region. We developed management plan for conservation of those habitats.

To conserve populations of wild bee *Xylocopa violacea* (national red list), we installed 56 artificial nests. 10% of the nests were occupied in two years, and it is evident that bees prefer the nests which are well warmed by sun or slightly shaded.

Also we installed three modular constructions called "hotels for insects" (fig. 3-4; coordinates: 1 - 50.241657°, 32.511523°; 2 - 50.303736°, 32.512444°; 3 - 50.316383°, 32.250599°) and held elucidative work on their purposes and benefits. Different insect groups (Hymenoptera, Coleoptera, flies and others)



may coexist or find a shelter for wintertime in a single "hotel". Why do we worry about different insects? They are pollinators that greatly affect seed regeneration of wild plants. Biodiversity of wild insects suffers very much from insecticides and hardly restores in wild habitats. So, national nature parks and volunteers could accelerate the process of restoring insect populations.

"Hotels for insects" became enough well known and popular in the region and are applied in events of the national nature park on a regular basis. The first "hotel" was open with participation of schoolchildren, volunteers and news media on 19 July 2016 and was installed nearby the office of the national nature park (N 50.241657°, E 32.511523°); the second one was installed in the recreation site (N 50.303736°, E 32.512444°) on 25 July 2016 and designed by students; the third one – on 08 July 2017 (N 50.316383°, E 32.250599°), with participation of the park guests from the Ministry of Ecology and Natural Resources of Ukraine, Association of Protected Areas of Ukraine, research institutions, schoolchildren and local residents.



Hotel for insects



Left: Student is installing artificial nests for insects made of reed. Right: Artificial nests for wild bee *Xylocopa violacea*. The arrow points to the individual of *Xylocopa*.

## 2.2. Restoration of herb layer in woodlands.

In order to restore destroyed herb layer, reintroduce natural components of forest flora and clarify dynamics of those, each year, starting from 2016, we implement actions for reintroduction of in-early-spring-flowering herbs, among them three species under national and international protection (*Pulsatilla patens* and *P. pratensis* ssp. *nigricans*, *Galanthus nivalis*) and other vulnerable plants (*Scilla bifolia*, *Corydalis* sp., *Anemone* sp.). Target habitats are two fragments of woodlands: the first is deciduous forest (coordinates N 50.397458°, E 32.331906°), right next to the land site for oak planting, and the second - mixed forest (N 50.335734°, E 32.501153°). Fresh seeds are collected each year, in May, from the nearest areas. Our students arranged experimental plots for reintroduction; as determinants are time of sowing and pre-treatment of seed, light degree, presence of litter. Within 2 years we recorded seedlings of each species in target habitats but during dry summer in 2017 most juvenile plants disappeared, so the next question is how to keep newly established populations in herb layer in next years?

## 4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Local schoolchildren are involved in our nature conservation actions, like planting of oaks, calculation of seedlings, and installation of insect nests, field research work, educational training and contests on a regular basis. So we involve young people in solving the problems that are relevant in their region, and help them to be active persons. Our events are covered by local news media.

Our scientific results on regulated winter harvesting of common reed provide information which is background for recycling of reed biomass. The most basic data are presented in a brochure. In such way we promote an idea of sustainable use of common reed, both for economic activity and environmental balance in the region and for biodiversity conservation purposes. Our activities give new evidence on the role of "healthy" floodplains in contrast to those having been drained, to solve the problem of lowering the water level in the river which is very urgent for local people. Our educational activity against the burning of old grass and reedbeds is aimed to explain to local people how harmful this practice is to their economy and health.

Installation of module constructions called "hotels for insects", planting of oak trees provide a platform for local people and volunteers to actualize their own need to interact with nature.

## 5. Are there any plans to continue this work?

Guidelines for nature management in target habitats are to be implemented for next 5 years and are incorporated in the 10-years management plan of the national nature park.

Such kinds of work as planting of oaks, reintroduction of vulnerable herb species in woodlands, installation of new nests for insect pollinators will continue on a regular



basis. The same thing applies to studies and experimental winter mowing in reed wetlands. Our educational work for local communities against burning of old grass and reed will go on twice a year, during the fire hazard timeframe (autumn and spring).

## 6. How do you plan to share the results of your work with others?

1. We disseminated a brochure containing project results, among local authorities and stakeholders in the region. Its title is "Nature management in the national nature park "Pyriatynskyi" (200 copies, In Ukrainian).



2. We prepared content for webpages, about main results of the project. For technical reasons, web-pages will be integrated into the website of the national nature park "Pyriatynskyi".
3. We visited villages and had interviews with people in local communities, during the campaign on reducing the practice to burn reedbeds.
4. We held annual regional environmental conference (Pyriatyn town, May 2017) where we shared our experience. We will continue discussing the results on the next regional environmental conference (Pyriatyn town, May 2018).
5. Information about our events and missions of our constructions for nature conservation through local news media.
6. Classes and trainings with local schoolchildren during a summer field research expedition (July 2016, July 2017).
7. We involved volunteers and schoolchildren to the installation of "hotels for insects", guests of the national nature park participated as well. Those constructions are installed on recreation sites and hence are available for visitors of the national nature park and local people. During the project we held four educational excursions including presentation of insect artificial nests; number of visitors is around 200 persons (about half part are schoolchildren). Excursion is focused on diversity of species, their ecological services, ways for their conservation, on design and installation of artificial nests for insects.
8. A scientific paper relating to insects: Protchenko Yu. Experience on application of nests-traps in the national nature park "Pyriatynskyi" / Ukrainian entomofaunistics, 2016, 7 (3): P.74-75.

A scientific paper on results relating to reedbeds is under preparation.

**7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?**

Planned: 01.02.2016 – 01.08.2017.

Actual: 01.04.2016 – 01.11.2017.

A tower for bird-watching is still under construction.

**8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
1. Planting of oak forest on 3 hectares: rent of agricultural machinery, tillage, chemical treatment	108	108	0	
2.1. Field works: Birdwatching tower engineering	925	867	58	a discount for a project layout from the developer
2.2. Field works: Materials for construction of a birdwatching tower and nestings: timber of pine, 1 m3	116	116	0	
2.3. Field works: Materials for construction of a birdwatching tower and nestings: timber of hardwood, 1 m3	173	173	0	
2.4. Field works: Gasoline engine scythe to mow reed and to control weeds in tree plantations	246	280	-34	Fluctuations in currency exchange rate and, therefore, in price in UAH
3.1. Research in wetlands: one annual license for ArcGIS software	108	78	30	An owner of the software (ESRI company) kindly provides us a discount as for a non-profit organization
3.2. Research in wetlands: Satellite images TERRA ASTER, 66.5 GBP (100\$) per scene of 60x60 km * 2 scenes	133	83	50	The terms for purchasing TERRA ASTER images changed. Instead of 2 TERRA ASTER scenes of 60x60 km, of 15-meter-resolution, we could order 1 satellite multispectral

				image of SPOT6/7 (AIRBUS Inc., France), of 100 km <sup>2</sup> and 6-meter-resolution. It was useful in identifying actual borders. Images for the rest territory were received for free, using SAS-Planet software ( <a href="http://www.sasgis.org/sasplaneta/">http://www.sasgis.org/sasplaneta/</a> ) and satellite images from services Google Maps, Yandex.maps and Bing Maps (Microsoft Co.).
3.3. Research in wetlands: Chemical analysis of reed mass: in total 65 GBP per a sample x 8 samples	520	548	-28	Price increase over the year
4. Transporting services	506	556	-50	Increase in fuel price over the year. Diesel fuel 1 liter: on 06.12.2015 - 0, 53 GBP (18, 5 UAH); on 01.07.2017 - 0.65 GBP (22.45 UAH). A-95 1 liter: on 06.12.2015 - 0, 65 GBP (22.5 UAH); on 01.07.2017 -0.72 GBP (24.91 UAH).
5. Accommodation in field conditions: 1) arrangement of a camping and field lab in July 2016; 2) servicing the field events	289	145	+144	In 2017 accommodation was for free. Changes to budget were approved by The Rufford Foundation on 21.06.2017.
6. Daily subsistence in trips: 2.89 GBP (100 UAH) per day x 268 days	775	907	-132	In 2017 daily subsistence has been increased up to 4.34 GBP (150 UAH) per day per person. Changes to budget were approved by The Rufford Foundation, on 21.06.2017.
7.1. Dissemination of information: the brochure of the project, a full-prepared layout and publication	147	147	0	
7.2. Dissemination of information: Web-design (130 GBP) on the project results + making video on events (81 GBP)	211	211	0	
7.3. Dissemination of information: Regional environmental conference: hall and equipment rental (58 GBP) + payment for	116	58	+58	Payments for guest speakers were arranged by efforts of the national nature park.

travel to 5 guest speakers (58 GBP)				
7.4. Dissemination of information: Events with schoolchildren: a multimedia projector for classes and events	289	289	0	
8. Banking services	20	32	-12	Banking services were higher than we'd expected. Changes to budget were approved by The Rufford Foundation on 21.06.2017.
9.1. Salaries: Accountant 9.2. Salaries: tax to the Pension Fund (=36,76% * fund of Salaries)	231 +85	231 +85	0	
Unexpected expenses	-	13	-13	Transfer expenses. After transfer we received 4985 GBP.
<b>Total</b>	<b>4998</b>	<b>5022</b>	<b>-24</b>	The main reason is the rise in prices. Difference was paid off due to fluctuations in the currency exchange rate (explanations below)

Notes:

Fluctuations in the currency exchange rate:

Operations	Sum in GBP	currency exchange rate, UAH per 1 GBP	date	Total amount in UAH
50% of currency exchanged *	2499	38.28	22.03.2016	95662
Second exchange	1253	33.4	10.01.2017	41850
Last exchange	1246	33.79	01.06.2017	42102
Sum	4998	-	-	179614
Total expected budget	4998	34.59	06.12.2015	172881
Surplus due to fluctuation in the currency exchange rate	199	33.79	01.06.2017	6733

\* According to the national regulations of the National Bank of Ukraine, transfer in foreign currency is subject to at-once mandatory sale in the interbank foreign exchange market of Ukraine, at the rate of 50 percent of the transfer.

Surplus – 6733 UAH – was spent on:

- 1) Over expenses: -24 GBP, or 830 UAH.

- 2) Renewal of the annual license for ArcGIS software which is appeared to be very useful in our research and nature protection work: 81 GBP, or 2750 UAH.
- 3) For the budget item 7.1: Dissemination of information: brochure on the project. In order to incorporate colour images and increase number of pages up to 30, we decided to increase total sum by 94 GBP, or 3153 UAH.

#### **9. Looking ahead, what do you feel are the important next steps?**

The greatest problem for nature management in the park is burning of reedbeds on a regular basis by local people. We revealed that this practice is also linked with poaching, because burning of old reed in mid or late autumn is commonly induced to facilitate hunting during the hunting season. So, the first crucial challenge for the nature park is to stop expanding harmful practice to burn reedbeds and old grass.

In fragments of natural habitats existing in the park restoration of wild populations of plants and animals is generally low or almost invisible which means that direct activities for restoration additionally depend on indirect human-made impacts. We plan to increase our capacity to monitor and reveal types of human-made impact that are most responsible for impeding the restoration of certain wild populations or habitats.

#### **10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?**

We published a brochure (in Ukrainian), where we used The Rufford Foundation logo. Also we are going to place the logo on the bird-watching tower, after its finishing. We declared the Rufford Foundation support and used the logo in reports at environmental and scientific conferences. Also we have the printed copies of news feeds about oak planting, from few web news media.

#### **11. Any other comments?**

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