



PROJECT LIFE12 NAT/PL/000031

COMPREHENSIVE PROTECTION OF NON-FOREST NATURAL HABITATS LOCATED IN MILITARY ZONE WITHIN NATURA 2000 AREA - BŁĘDOWSKA DESERT

implemented in 2013-2017

MAIN OBJECTIVES, GOALS, ACTIVITIES AND RESULTS

Beneficiary: Regional Infrastructure Authority in Cracow
represented by Colonel Przemysław Breliński

Coordination: Project Manager: Edyta Mazur

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Inspector for Project Execution Katarzyna Kępa

Funded under the Comprehensive protection of non-forest natural habitats in military zone within Natura 2000 area - the Błędowska Desert by European Union within the framework of the Financial Instrument LIFE+ and by the National Fund for Environmental Protection and Water Management.





The Błędownska Desert is a great natural particularity not only on the Polish scale. The recreation of the most important sand habitats and their natural values helps to maintain the unique qualities of the desert. This area in order to protect it needed crucial and immediate actions such as trees and bushes removal which results in recreation of suitable conditions for restoration of the natural habitats, it means, inland dunes with sandy grasslands.

The European Ecological Network "Nature 2000" is a network of natural areas with extraordinary features designed throughout the European Union countries; the Błędownska desert is a part of this network with its reference code of PLH120014. Both parts of the Desert, White Przemsza Valley, and pine tree forests surrounding it are included.

The Błędownska Desert is located in the central part of the "Kraków-Częstochowa" Upland, around 10 km in the north-east from Olkusz. The area is bordered to the east with Klucze town, Chełm to the north, and Dąbrowa Górnicza to the west. The Southern part of the desert is used by the Municipality Klucze, while the northern is used for military exercises; separated by the valley of the White Przemsza river.



Ryc. Borders of Natura 2000 area PLH120014 the Błędownska Desert



Over the period 2011–2014 the Municipality Klucze established first step of active protection of this area (southern part of the desert) under the Project; LIFE NAT/PL/000259 *Active protection of complex natural sand habitats within Natura 2000 area on the Błędownska Desert*, while over the period 2013-2017 Regional Infrastructure Authority in Cracow carried out under the project LIFE12NAT/PL/000031 „*Comprehensive protection of non-forest natural habitats located in military zone within Natura 2000*” area. The next step involves trees and bushes removal from northern part of the Desert which is permanently controlled by the management of Polish Army. An exceptionally favourable circumstance that enables a successful implementation of the project is the harmony between objectives that originate from nature protection, and the needs that are attached to the military use of this place. Since deforestation of dunes and grasslands improve both natural habitats that are under control, and organisation of military exercises (for example: parachute jumps). It should be noted that ever prior implementation of this project, condition of natural habitats was slightly better in the area intended for military use while compared to the southern part dedicated for civil use. It resulted from the actions undertaken by the manager of this place. In order to create suitable conditions for parachute jumps, trees and bushes were removed from a part of this area which also led to preservation of typical sandy fauna and flora of the place.

The managements organs supervising the Natura 2000 area PLH120014 the Błędownska Desert are: Regional Directorate for Environmental Protection in Cracow, as well as Regional Directorate for Environmental Protection in Katowice. The protection task plan for Natura 2000 the Błędownska Desert is a fundamental document which determines implementation of protection activities, and it has the local status of legal act.

Natural habitats of the Błędownska Desert

Natural habitats which are protected in this desert are not characterised by extremely rare endemic species of flora and fauna. It seems appropriate to say they have a really small biological variety and typical plant and animals species for well developed dry habitats dominate there.

There are 4 types of natural habitats in the Błędownska Desert

- 2330 – inland dunes with sand calcareous grasslands ;
- 6120 – thermophilous inland sand grasslands (*Koelerion glaucae*);
- 9130 – fertile beech woods;
- 91E0 – elm-ash forests and willow-poplar gallery forests.

In the area included in this project only two types of sand habitats are present – 2330 and 6120. Small fragments of riparians (91E0) can be seen in White Przemsza, between northern and southern part, while fertile beech woods can be found in southern part – on the Czubatka Hill.

2330 – inland dunes with sand calcareous grasslands

This types of natural habitats are made of open formations of inland dunes , with dry silicate soils, extremely poor in species. Formations of unstable sands with grey hairgrass are a part of it. *Corynephorus canescens* as well as rich flora of lichens (*Cladonia* sprouts, *Cetraria* sp., caddisflies *Stereocaulon* sp.), with a big contribution from *polytrichum piliferum*



Distinguishing this habitat from sand grasslands of this place is really difficult. Since both create a dynamic ecologic complexes of overlapping loose flaps of sand and steadily consolidating grasslands on their own.

6120 thermophilous inland sand grasslands (*Koelerion glaucae*).

These are Island sands with visibly continental characteristics , covered by low and loose grasslands, with numerous grasses which grow in tufts, with shoots build enabling survival in dry environment, and widely developed system of roots. On the territory of the Błędowska Desert a poor variety of species is present. Those communities are mainly characterised by increased contribution of *Koeleria glauca*, and grey hairgrass *Corynephorus canescens*.

In the area of the the Błędowska Desert there's a complex of inland dunes with sand calcareous grasslands (habitat 2330), overlapping flaps of more dense grasslands included in 6120.

SPECIES OF PLANTS CHARACTERISTIC FOR SAND HABITATS PRESENT IN THE BŁĘDOWSKA DESERT:

SPIKY BLUE CORYNEPHORUS CANESCENS



PHYMUS SERPYLLUM





HELICHRYSUM ARENIARUM



Activities of the project LIFE 12 NAT/PL/000031

The entire area under active protection (northern part of the Błędowska Desert) is a one big plot of land registered at nr 2652/2, serving as an exercise place for military, under disposal of Ministry of Defence permanently managed by Regional Infrastructure Authority in Cracow. The main form of land use is as a drop zone for paras, military equipment and supplies.

This territory is situated within the Natura area 2000 PLH120014 the Błędowska Desert, where Only two types of natural habitats are under protection – inland sand grasslands (code 6120), and Island dunes (2330). As a result the goal of this Project was defined in a simple manner – to remove trees and bushes from this area, more precisely – scots pine, betula pendula, Aspen tree, gaultheria mucronata and partly salix repens subs. arenaria. Those activities have to be performed in a properly, in order to decrease their negative impact on particular species related to sand habitats.

Other activities within the project mainly focused on promotion of the experience collected during a project implementation, development of good practices and recommendations, but first and foremost, they were dedicated to stimulate military institutions to take active participation in tasks related to nature protection in numerous places within the Natura 2000 area, which include active training exercise grounds and other places used for military practice.

Area preparation for active protection work

The main objective of the project was to perform activities for active protection, mainly to remove trees and bushes, which growth would cause a deterioration of sand habitats which are under protection in the Błędowska Desert and their conditions. Since the territory has been used for years by military, especially during World War II, it was known, that explosive and dangerous objects can be found there. Works that have been done under project LIFE NAT/PL/000259 by Municipality Klucze on the southern part of the desert in period 2011–2014 confirmed those assumptions. As a result similar works were done under previously described project LIFE 12 NAT/PL/000031.



The area which is currently dedicated for military use (374 ha), is situated in the northern part of the Błędowska Desert, so far it's been cleaned approx. 30cm deep. This enabled ordinary use for military practice on the surface, however the work that was scheduled that involves grubbing-up and in the ground even a few metres deep, was impossible to be done successfully without clearing this territory from dangerous and explosive objects beforehand.



Explosives preparation for detonation in the Błędowska Desert. Photo credit. Regional Infrastructure Authority in Cracow, project Life archive



Storage of explosive materials in the hole when they are soon to be set off in the Błędowska Desert area. Photo credit. Regional Infrastructure Authority in Cracow, project Life archive.



Detonation of explosive materials in the Błędowska Desert area. Photo credit. Regional Infrastructure Authority in Cracow, project Life archive.

As a result of work that has been done, approx. 9500 explosive and dangerous objects were discovered, and they were classified as described below:

- aerial bombs: more 250 kg,
- aerial bombs: from 50 to 100 kg,
- aerial bombs: less than 50 kg,
- artillery ammunitions: from 37 to 75 mm,
- artillery shells: from 70 to 120 mm,
- artillery ammunitions from 37 to 75 mm,
- artillery ammunitions up to 36 mm,
- rocket ammunitions,
- mortar grenades from 81 to 82,
- antipersonnel landmines,
- fuses,
- rifle and pistol ammunition,
- rifle grenades,
- shells.

What's more approx. 4,5 tons of waste and significant quantities of scrap were found.



Examples of explosive and dangerous objects , found during works undertaken on northern part of the Błędowska (fot. RZI w Cracow, project archive LIFE 12 NAT/PL/000031)



Podjęmowanie bomby odnalezionnej w czasie prac saperkich prowadzonych na Pustyni Błędowskiej (Photo credit. Regional Infrastructure Authority in Cracow, project Life archive).



Active protection of sand natural habitats – removal of trees and bushes

Work regarding active protection of sand natural habitats which involve removal of trees and bushes, was considered the most significant activity within the Project implemented by Regional Interference Authority in Cracow in the Błędowska Desert. It was assumed it had lead to an increase of conditions in natural habitats, for which Natura 2000 area was created, that is thermophilous inland sand grasslands (code 6120 – priority habitat), and inland dunes with sand calcareous grasslands (2330). Direct goal of this project was development of an appropriate protection level of natural habitats in the area approximately 217 ha. big. Works associated with removal of trees and bushes was undertaken al most in the en tire territory that was included in this Project, that is approximately 366 ha. From these works was excluded an enclave approx 8 ha big, due to the presence of valuable plant species, and protection of Bird habitats. This area will carry a crucial meaning for protection of biological variety and will help to diversify the monotonous „desert” landscape of sand habitats.



Enclave of scots pine trees maintained in the area of under the project as a sanctuary for species related to ecotonal ecosystems, characteristic for advanced stage of secondary succession in sand habitats (Photo credit. Regional Infrastructure Authority).

The proper implementation of such works in places which carry significant natural value required effort, and fruitful cooperation of many people and institutions. These works were conducted under strict ornithological supervision supplied by the constructor (with a special consideration of breeding periods of birds) as well as cooperation with a team conducting environmental monitoring, a supervisor inspecting the removal of trees and bushes, Consultant for Natute Matters and Project Management Board, which includes representatives from Regional Directorate for Environmental Protection, universities, forest districts, landscape parks and military.



Limited panel of *Arctostaphylos uva-ursi*. It's the only place where this protected species can be found in the area of this project. Visible ground marking of this place was essential to protect it from accidental damage caused by vehicles (Photo credit. Justyna Markiewicz-Kuchta)



Skidding trees , and individual Bush removal in the area of the project (Photo credit. Edyta Mazur)



Area of the project immediately after trees skidding (Photo credit. Edyta Mazur)



Area of the project right after essential works for active protection were undertaken – trees and bushes skidding and grubbing-up. It's necessary to point out that cones, small fragments of roots, and branches remain after these works were undertaken. Such area should be cleaned up with the use of sandcleaner – equipment involved in cleaning up of bitches by the sea. Nonetheless, despite multiple cleanings, small amounts of organic scraps remain especially in the places where, the trees and bushes grew close to one another, and the layer of litter was thick (Photo credit. Edyta Mazur)



Project area before (Upper half of the photo) and after a single use of subsoiler with tooth packer rollers and sandcleaner (equipment funded under the project in 2017r.). (Photo credit. . Edyta Mazur)



Works in the area with the use of subsoiler with tooth packer rollers (on the left), and sandcleaner (on the right) (Photo credit. Edyta Mazur)



The area before and after removal of *Salix repens* subsp. *arenaria* (Photo credit. Edyta Mazur)



The view from the Dąbrówka hills (before and after protection works) to the place with its working title „płaszczatka”. It's a wide, open surface situated in the central part of the area under the project. Active protection of this particular area mainly involved individual removal of trees and bushes by the use of excavation. These included pictures successfully illustrate the direct and proper condition of recreated natural habitats. Unfortunately after the Project was completed the level of natural habitats recreation isn't adequate for the entire area, but we assume, that ecological processes that were brought to life and appropriate maintenance of this place after Project completion, will enable development of condition in the entire area in future. (Photo credit. Edyta Mazur)



Thymus serpyllum in the territory of recreated natural sand habitats. This species handled well undertaken works within active protection, which in the area where well maintained sand grasslands are present, were conducted with significant care. Even when only a part of



panel of this plant was damaged, it can regrow at a Fast pace in the places where works were conducted. (Photo credit Justyna Markiewicz-Kuchta)



Hieracium pilosella. is a common species for natural sand habitats and they show positive reaction to trees, bushes, bitter removal and colonise quickly in places where there are no plants due to grubbing-up (Photo credit. Edyta Mazur)



The view to the Błędowska Desert from the Czubatka Hill. In the foreground there is visible the northern part of the desert, where Municipality of Klucze in period 2011-2014 implemented the project LIFE NAT/PL/00025. In the background can be seen Rather small the Dąbrówka Hill, which dominates over the northern part of the desert, that was included in the described project LIFE 12 NAT/PL/000031. Both parts of the Desert are separated by White Przemsza Valley. The activities conducted within both projects enabled the recreation of open, sand non-forest habitats complex in the borders taken from maps created in 1950's of 20th century. (Edyta Mazur)



The Dąbrówka hill before and after trees and bushes removal. (Photo credit: Edyta Mazur)



The risk related to repeated succession of plants after conduction of trees and bushes removal

The most significant risk, considering the Project goal – recreation of sand habitats – is re growth of the removed trees and bushes. It involves most importantly so-called root suckers. They result from undertaken activities for protection of sand grasslands and Island Dunek. They can emerge from leaf trees and bushes. In this case it's mainly related to : populus tremula, Betula L. *Salix acutifolia*, and occasionally visible in this area invasive species – prunus serotina.

In several years after grubbing-up trees can emerge siewki common in this area scots pine. The intensity of the regrow can be significantly limited by careful storage of organic scraps after removal, and grubbing-up of scots pine – h Due to their all ability must be conducted regularly in the following years with the use of spoiler, and sandcleaner.

It's necessary to emphasize, that activities performer in this area can be rather viewed as an experiment and the lack of direct scientific data on the matter of active protection of sand habitats in our country on such a scale.



This area is mainly used as a place to exercise parachute jumps and drops. Extension of non-forest area gives an opportunity to organise exercise on a larger scale and to decrease the cost of such trainings (before and after active protection implementation) (Photo credit: Edyta Mazur)



Military exercise on the Dąbrówka Hill near viewing platform that constructed within the scope of the project (Photo credit. Jacek Nowak)

Purchase of equipment for field works

The car Mitsubishi L200 (4×4), a drone with accessories, equipment needed for cleaning operations; subsoiler with tooth packer rollers and sandcleaner.



Promotional and educational campaigns

Project carries a high demonstrative value. During the implementation period of it methods for active protection of sand habitats have been improved. They were formulated in the scope of previous part of the Project dedicated for the Błędownska Desert and conducted by Municipality Klucze. Furthermore it's a groundbreaking venture based when taking into account the location



and land manager – all works were done on active military exercise ground . As a result, the promotion

of information on the Project wasn't one of the most important factors. Therefore the educational-promotional campaign that we launch was targeted at mass recipient for instance through series of reports Aires in public TV, as well as directly to military institutions and at people who work in other military places ,with special consideration of active military grounds.

The main educational and promotion activities implemented in the scope of the Project include:

- series of 4 reports aired in "TVP Kraków", and other regional TV networks– program "Regained by military. The Błędownska Desert"



- **series of 10 trainings** mainly targeted at military institutions and units that administrate military grounds on the entire territory of Poland. The trainings focused on way of nature protection and the regulations regarding how to behave in the places included in Natura 2000 protection, waste management, and the dangers beyond leakage of petroleum products". 300 people combined participated in these trainings. They received training, informational and promotional materials.





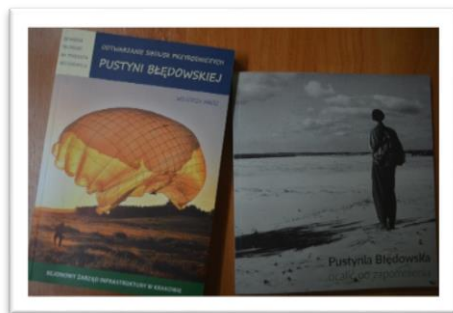
- **Field Information Point**, situated directly next to the area under protection (shed with approximate dimensions of 22 m x 6 m, and 7 information boards). This place is dedicated to soldiers use only. They can get familiar with information on the Project, Natura 2000, the Błędowska Desert, flora and fauna through 7 boards placed there during their breaks in military exercise.



- **Viewing Platform next to Bunker on the Dąbrówka Hill**. Construction of steel on reinforced concrete foundation in a shaper of equilateral triangle with 18cm long side with a ramp for the disabled, weather station and 8 information boards on the project, Natura 2000 area, and flora and fauna of the desert.

Viewing platform available for tourism purposes.





- publications in polish and english language:

„Nature protection of military grounds. The Błędowska Desert Natural habitats restoration” (Mróz W. 2017) and „The Błędowska Desert. Save it from oblivion” (Głowacka M. 2017, W.Mróz (red.).

- Popular science articles published in national and local press (Monthly magazines: “Aura” and “Przyroda Polska”),

- active participation in national and international conferences;

- organisation of international conference

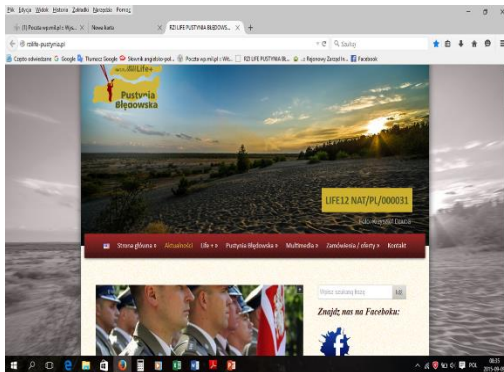


MIĘDZYNARODOWA KONFERENCJA
 Podsumowująca Projekt LIFE12/NAT/PL/000031
 „Kompleksowa ochrona nieleśnych siedlisk przyrodniczych
 na terenach wojskowych w obszarze Natura 2000 - Pustynia Błędowska”





Conference summarised the achieved goals as a result of project implementation, it was a place for exchange of knowledge and experience within the matter of nature protection on military grounds in Poland and other European Union countries. (Photo credit. Jacek Nowak).



- **project website:**

www.rzilife-pustynia.pl

- establishment of Web with other projects – connections, meetings, conferences which lead to exchange of experiences, cooperation and projects activities promotion in Poland and other European Union countries

Monitoring the impact of protection activities

Nature monitoring was conducted in two stages – before the start of technical works related to trees and bushes removal and as a final monitoring – after last works were completed. Highly detailed analysis on ecological impact of implemented works was carried out. In order to limit irreversible secondary effects. Works results are the starting point for habitats regeneration pace estimate and making decision the future associated with protection activities matter in this area.

Work programme after the Project completion

In order to guarantee that this Project will leave a lasting impact will a work programme was prepared. It includes:

- maintenance of suitable condition of natural through regular elimination of emerging natural seeding and undergrowth of trees and bushes and maintenance of deflationary fields through sand cleaning;
- continuation of the project ecological impact monitoring;
- continuation of trainings series “Nature protection, and non-forest nature habitats protection”;

LIFE12 NAT/PL/000031

COMPREHENSIVE PROTECTION OF NON-FOREST NATURAL HABITATS
LOCATED IN MILITARY ZONE WITHIN NATURA 2000 AREA – THE BŁĘDOWSKA DESERT



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- cooperation with Municipality of Klucze and military units which use the Błędowska Desert in the matter of protection activities;
 - maintenance of website with information on the project implemented.