

# EARTHWATCH INSTITUTE ANNUAL RESEARCH REPORT

**Date completed:** 2.12.2007

**Completed by:** Natalia Zeliankevich

**Period covered by this report:** 30.07.2007 to 2.09.2007 (field season)

Dear Volunteers,

We welcome everyone who visited Belarus in the summer 2007 and participated in our project!

We achieved a lot thanks to you. As you know, these data will be actuality in geobotany till 50 years! All the data will be processed during winter time and used in the future for the preservation of our nature.

We thank all of you very much for your kind help in the field. Without your help we could not do so much.

All our researchers remember the fine August that has been carried out together with you, our wonderful, hard-working, cheery, inquisitive and courageous volunteers!

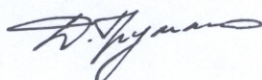
We hope that you have not forgotten the Belarusian hospitality, Belarusian Land, our people and our wetlands, of course.

All our best to you and thank you so much,

Natasha Zeliankevich



Dmitry Grumo



Oleg Sozinov



## Reporting on objectives

**Objective 1:** On the basis of obtained data, to find (and recommend to conserve) the most unique and valuable natural complexes.

1.1: To obtain current data on geobotanical structure and changing conditions of Belarusian raised bogs.

The geobotanical structure has been investigated; the estimation of a modern condition has been studied and maps of bog vegetation of bogs *Velikij Moh*, *Fomino* and Reserve "*Krasnyj Bor*" have been created.

The ecological and phytocenosis structure and productivity of raised bogs of bogs *Velikij Moh*, *Fomino* and Reserve "*Krasnyj Bor*" have been investigated. On the basis of results of the research:

- the studied unique bogs are included in protected areas;
- objects of research are included in System of Monitoring of Vegetation.
- materials of research are used by employees of Reserve "*Krasnyj Bor*".

1.2 To locate of new areas where rare &/or endangered species can be found

9 new places of growth of 4 rare protected and endangerous plants are found. Materials of researches will include in next edition of Red Book of Belarus.

5 rare plant communities of raised bogs in territory of Belarus are found and described. Materials of researches are included in a cadastre of rare and unique plant communities developed by the National Academy of Sciences.

**Objective 2:** To create a methodological base and criterion for the conservation of wetlands together with a complete study of vegetation of the most representative bogs of Belarus; to carry out a full complex of geobotanical investigations on them.

2.1: To investigate anthropogenic influence and the dynamic processes involved in the structure of bog vegetation.

Complex of experiments for influence of anthropogenic using of bog was conduct on different types of bog vegetation.

2.2 To develop criteria for the allocation and protection of unique bog complexes.

Materials of research are used by development of recommendations for the Ministry of Natural Resources of Belarus on protection and rational economic use of bogs.

On the basis of this research the creation of National System of Monitoring behind a condition of natural bog vegetation by the Ministry of Natural Resources to 2006-2010 is decided

## Non-technical summary of results

This year we continued to carry out large-scale complex research on the vegetation of raised bogs. This is the first time that such a large-scale study has taken place in Belarus. In 2007 two ecological profiles and 22 typological sample plots on the bogs were created.

As a result of the research:

- Knowledge of the ecological laws of formation of raised bog vegetation of the Northern geobotanical subzone were expanded and studied;
- The principal causes of degradation of bog ecosystems were analyzed;
- The vegetative resources of natural bogs, used in the procuring purposes such as medicinal raw material and berry-fields were recorded;
- A map of the ecological condition of bog vegetation was supplemented;
- geobotanical scales of definition of safety of vegetation of raised bogs were developed.

**Give an account of the data collected and results (inputs and data) for the period covered by this report, mentioning any emerging trends.**

### Research Site(s):

Profile #27 – bog Bolshoy Moh (Reserve “Krasnyj Bor”)

Profile #28 – bog Velikij Moh

Profile Fomino – bog Fomino

All profiles situated in Rossony region, Vitebsk district, in the Northern part of Belarus.

### Leveling territory

We surveyed 3 new bogs and 2 new ecological profiles on which are incorporated:

Tool leveling on ecological profiles;

All changes in landscape and vegetation cover were analyzed.

We leveled 6.4 kilometers of bog surface in total.

### Analysis of typological sample plot (TSP)

22 new 400-600m<sup>2</sup> typological sample plots (TSP) (dependent on density of trees)

Completion of all forest evaluation and geobotanical research including the study of vegetation on all layers and soil-hydrological conditions for each TSP was completed.

### Digging of the soil profile and description of the peat (soil) structure

Structure and composition of soil (peat) profiles were described for each TSP.

We took 52 samples of peat for chemical laboratory analysis and for analysis of the botanical structure.

### Measurement of productivity and description of the forest stand

Data on trees includes:

- species identification
- diameter of each tree
- height of trees

We measured almost 2000 trees in total.

### Measurement of productivity and description of ground vegetation

We took 635 samples of mosses and plants for weighing in the lab (dry weight).

For each TSP we took 5 sample plots (0.5M x 0.5M), cut off all surface vegetation, and separated by species.

Removed all moss from an area of 0.25M X 0.25M within each sample plot: each sample was weighed (wet weight).

Described vegetation on 25 plots (1x1m) on each TSP (550 in total)

#### Collection of samples of peat, plants, lichen, moss and tree core samples

A herbarium of vascular plants, mosses and lichens was collected.

We took 30 tree core samples for the estimation of growth rings.

#### Protected species of plants encountered:

1. *Betula nana* L. – endangered (1 location)
2. *Rubus chamaemorus* L. – endangered (1 location)
3. *Oxycoccus microcarpus* Turcz. ex Rupr. – vulnerable (6 location)
4. *Salix myrtilloides* L. – vulnerable (1 location)

#### Geobotanical description of communities

Researchers described nearly 200 plant communities.

#### Experiments

6 experiments on the influence of anthropogenic impacts (trampling) on the bog were conducted on different types of bog vegetation.

### **How do these data contribute to achieving conservation impacts? (e.g. actions based on results, management plans, site protection)**

The results of our research are being used in the development of recommendations on the protection and rational economic use of bogs by the Ministry of Natural Resources of Belarus.

On the basis of our data, the nature sanctuary of national value “bog Fomino” has been created.

The locations of growth of nationally rare plants are included in a national database and will be handed for protection on a local level. Also newly discovered locations will be included in the next edition of the Belarus Red Book.

The data have been used for development of plan-management of Reserve “Krasnij Bor”.

### **What is/ are the significance/ benefits of your research at the following levels?**

- Local (to the area of the research site):

Locations of growth of rare plants are included in a national database and will be made available to allow for protection on a local level.

The data have been used for the development of a management plan for the Reserve “Krasnij Bor”.

National / Regional:

Our data will be used in:

- The State Program “Development of National System of Monitoring of Belarus” 2006-2010.
- The State Program “Resources of Vegetation and Fauna” 2006-2010.
- Belarus Project of Fundamental Investigation “To develop theoretical bases and methods of ecological mapping of a vegetative cover; to state a cartographical estimation of an ecological condition of vegetation of key especially protected natural territories and industrial areas of Belarus” 2007-2009.
- The locations of growth of rare plants will be included in the next edition of the Belarus Red Book.

International:

- Cooperation with scientists from other countries (Russia) occurred during the project.
- Participation in the international conference “Actual problems of geobotany” in Petrozavodsk, Russia, September, 27-30, 2007.
- Integration with the European system to the list of communities of bog vegetation is planned.

## Communication of results

All our communications of results, Earthwatch is acknowledged.

All publications printed in Russian.

### Printed in 2007:

Dr. Dzmitry Grumo – The review of the project of Global Ecological Fund "Restoration of a hydrological mode of a riding bog Yelnya".

Sozinov O., Grumo D., Zeliankevich N., Yluchik M., Broska T. – Key botanical territory of international values – forest-bog complex Yelnya: the modern condition of vegetation, strategy of its restoration and protection.

Grumo D., Zeliankevich N. – Some results of research of vegetation of raised bogs of Belarus.

Sozinov O., Grumo D., Zeliankevich N., Broska T. – Protected plants on raised bogs of geobotanical subzone of oak–dark-coniferous forest: new finds.

### In print:

Sozinov O., Grumo D., Zeliankevich N., Broska T. – Protected plants on raised bogs of Belarus: inventory and new finds.

Grumo D., Yluchik M., Zeliankevich N., Sozinov O., Puchilo A. – Experience of distance monitoring of vegetation of especially protected natural territories (by the example of hydrological reserve "Yelnya").

Zeliankevich N., Grumo D., Sozinov O. – Estimation of influence of anthropogenic impact on vegetation of raised sphagnum bogs.

Sozinov O., Grumo D., Zeliankevich N., Broska T. – Data on new places of growth of protected plants on raised bogs of northern geobotanical subzone of Belarus.

**Visual:**

IEB – Poster "Monitoring of bog Yelnya" – at an exhibition devoted to the First Congress of Scientists of Belarus from October, 30 till November, 2 2007.

**Digital:**

Dr. Dzmitry Grumo – Database of vegetation of bog plant communities.

<http://www.belarustime.ru/br/together/d8cd4e6a240292df.html>

[www.embassybel.ru/news/science/2007/08/14/13976/](http://www.embassybel.ru/news/science/2007/08/14/13976/)

[www.vitebsk-region.gov.by/ru/anons/bcd9d44ce0429350.html](http://www.vitebsk-region.gov.by/ru/anons/bcd9d44ce0429350.html)

[www.radiobelarus.tvr.by/rus/news.asp?id=3336&date=07.02.2007%2012:10:00](http://www.radiobelarus.tvr.by/rus/news.asp?id=3336&date=07.02.2007%2012:10:00)

[http://portal.grsu.by/portal/?p=/FACULT/BIOL/EXPED/p\\_index](http://portal.grsu.by/portal/?p=/FACULT/BIOL/EXPED/p_index)

<http://www.tvr.by/lib/playvideo.asp?id=4873&table=newsvideo&date=21.07.2004%2010:21:00>

**Mass media:**

Article "Bog people" – newspaper "Vedy", June, 25, 2007.

Dzmitry Crumo, Natallia Zeliankevich – Interview to 1 channel of Belarus Radio, program of Academy of Science, August, 19, 2007

Dzmitry Grumo – participation in program "Ravnovesie", 1 National TV Channel, August, 15, 2007.

**Meetings and conferences:** presentations/ lectures; conferences; workshops; training sessions; discussions; local community meetings and events.

Dr. Dzmitry Grumo – Participation in workshop "Plan of restoration of hydrological reserve Yelnya", March, 22–25, 2007.

IEB – presentation of Institute progress on the First Congress of Scientists of Belarus from October, 30 till November, 2 2007.

IEB – presentation of Institute progress on the workshop devoted to 70-year-olds of Institute of Experimental Botany of NAS of Belarus, January, 2007.

**Educational resources:**

"The ecological, geographical and structurally functional analysis of vegetation of raised bogs of Belarus, technique field and lab researches" – rate of lectures of "Ecology" and "Geobotany", special course "Belarus vegetation":

– Stepanovich I.M. – professor of faculty of biology, Belarus State Pedagogical University  
– Sozinov O.V. – senior lecturer of faculty of botany, Grogno State University

First Congress of Scientists of Belarus from October, 30 till November, 2 2007.

## **Educational Opportunities**

**Does your project directly or indirectly involve the following groups in your research topic?**

- Local communities: employees of Reserve “Krasnij Bor”
- Students: students of 2 Universities (lectures)
- Early career scientists: the edition of the scientific monography is planned
- Other groups

**How does your research help these groups better understand and act towards the conservation of a sustainable environment? (Please provide specific examples of any activities you are aware of.)**

Persons connected with the project can easily see the influence of human activity on natural communities; they can see that it takes just minutes to destroy habitats that have taken nature thousands of years to create. At the same time the project provides an amazing opportunity to observe how nature tries to keep a balance and to restore things to the natural situation. Nature is a mighty force, but demands a very careful attitude and this is clear to everyone connected to our project.

**Has your project contributed to the completion of Masters’ or PhD theses or degrees, or other educational research findings?**

Last year – masters thesis of the assistant of the project – Tatiana Broska “Flora of National Park of “Naroch”.

## **Acknowledgements**

We thank absolutely all volunteers participating in our project. Your help was useful and essential. We thank you for your patience, goodwill, diligence, enthusiasm and interest.

We thank all who helped us on the field, including employees of the Reserve and Forest Service.

We express gratitude to all staff of the Earthwatch Institute that worked with our project.