

Developing a national strategy for the conservation and sustainable use of peatlands in the Republic of Belarus

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SUMMARY

During most of the 20th century, peatlands in Belarus were regarded primarily as a strategic resource for agriculture and energy. In 1991, the Council of Ministers approved a “Scheme of Sustainable Use and Conservation of Peat Resources until 2010” (the “Scheme until 2010”) which allocated a considerable fraction of the country’s mires to nature conservation. Expiry of that Scheme has prompted its replacement with the “National Strategy for the Conservation and Wise (Sustainable) Use of Peatlands in the Republic of Belarus” (the “Strategy”) supported by a new “Scheme until 2030”. The aim is to meet the requirements for both sustainable development of natural resources within Belarus and international conventions. This article describes the development of the Strategy, which was achieved in conjunction with a detailed appraisal of the current state of peatlands in Belarus. The outcome is that the “Scheme until 2030” allocates almost all of the mires that have so far been confirmed still to be in natural (pristine) condition (684,200 ha or 29 % of the total peatland area) to nature conservation, 19,600 ha (1 %) as a reserve of ‘especially valuable’ peat, 99,100 ha (4 %) for commercial peat extraction, and 1,592,600 ha (66 %) for agriculture and forestry.

KEY WORDS: agriculture, ecotourism, nature protection, peat extraction, peatland forestry, wise use

INTRODUCTION

The Republic of Belarus is a land-locked country situated near the geographical centre of Europe, sharing borders with the Russian Federation to the east, Latvia, Lithuania and Poland to the north-west, and Ukraine to the south. It is relatively rich in both natural and drained peatlands, which cover a total area of 2,560,500 ha (12.33 % of the country) according to the current best estimate (Tanneberger *et al.* 2017; Figure 1).

The systematic study and inventory of Belarussian peatlands started in 1928 and was especially active until the start of the Second World War. The “Cadastre of Peat Deposits of BSSR” was published in 1940. Intensive study and large-scale use of peat resources began after the War. In 1953 the new cadastre directory “The Peat Fund of Belarussian SSR” was developed; this included 5,945 peat deposits with total area 1,467,550 ha. In 1979 the directory was updated and reissued as “The Cadastre Directory of the Peat Fund of BSSR”, listing 7,055 peat deposits with total area 2,543,780 ha.

Until the last decade of the twentieth century, peatland in Belarus was regarded mainly as a strategic resource to be developed for agriculture and energy. Peat still contributes substantially to the

energy and economic security of Belarus. The peat industry employs more than 5,000 people and during the five years 2011–2015, 1.7–3.2 million tonnes of peat were extracted annually, mainly for energy. There are more than 30,000 people living in towns and villages where peat enterprise is the main employer, and up to one million residents of the country use heat produced from peat (Rudinski 2013). As a result of human impacts on natural mire ecosystems and the unsustainable use of some areas of drained peat soils, processes of peatland degradation can be observed.

Mires, defined as peatlands where peat is currently being formed, are essential for securing the sustainability of the biosphere. They store substantial quantities of fresh water which ensures the conservation of water resources and provides a water supply for rivers and lakes. Thus, one of their key roles is to maintain a regional hydrological regime that is favourable for the functioning of natural ecosystems. They also constitute a significant terrestrial carbon store, and affect greenhouse gas exchange by removing carbon dioxide from the atmosphere and releasing oxygen as well as small amounts of methane and oxides of nitrogen. Moreover, the mires of Belarus provide habitats for rare and endangered wildlife. More than 40 % of bird

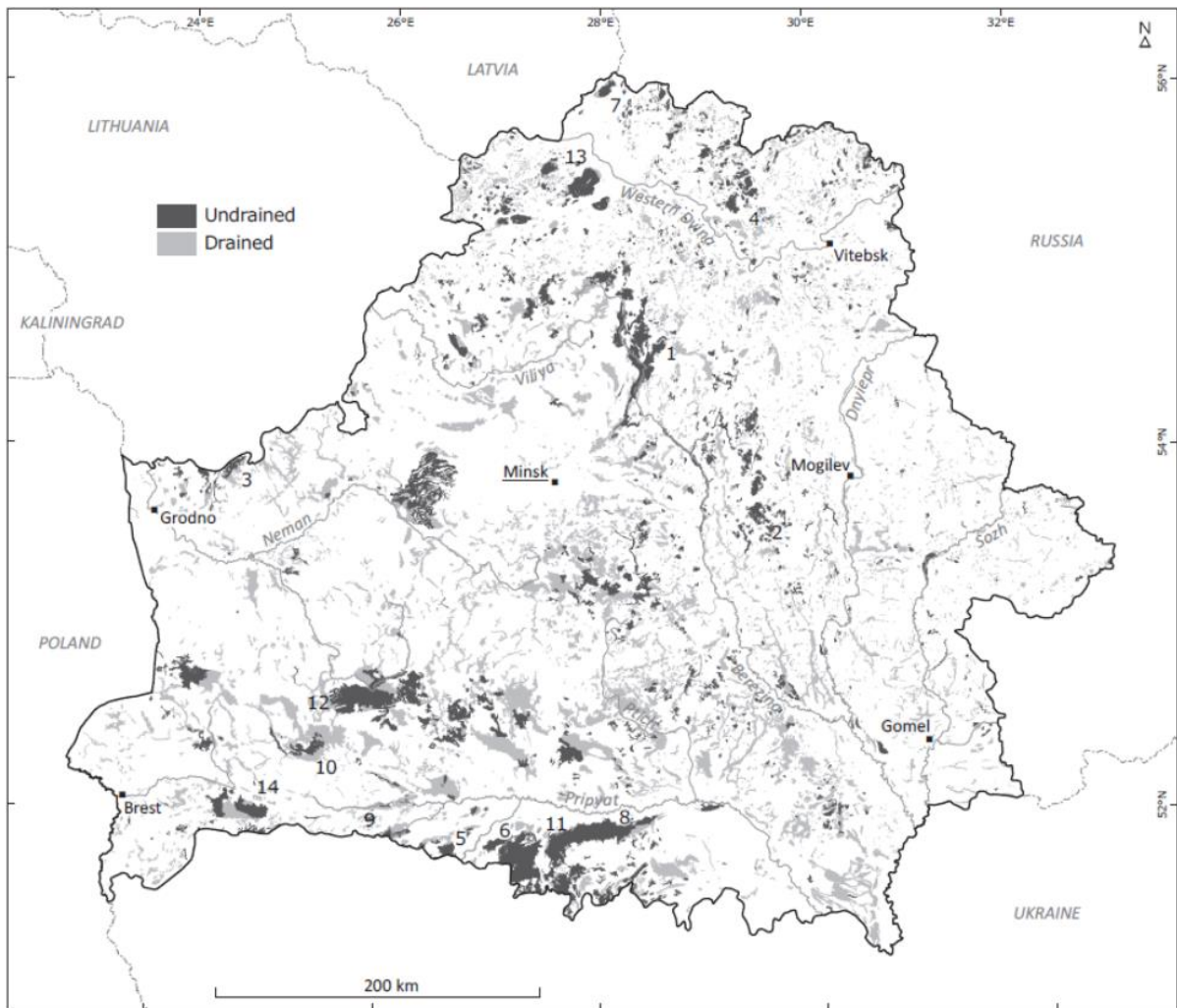


Figure 1. The current distribution of natural mires and drained peatlands in Belarus. Source: SPCB (2016). This Figure is reproduced from Bambalov *et al.* (2017).

species, 35 % of insect species and 15 % of wild plant species listed in the Red Data Book of the Republic of Belarus inhabit mires. Amongst these are globally endangered birds - about 40 % of the global population of Aquatic Warbler (*Acrocephalus paludicola*), 10 % of the world population of Greater Spotted Eagle (*Clanga clanga*) and 3 % of the world population of Great Snipe (*Gallinago media*). Belarussian mires additionally accommodate considerable biological resources such as cranberry (*Vaccinium oxycoccos*), medicinal plants and game; and the development of ecotourism in Belarus is largely linked to the recreational potential of mires.

Recognising the potential for conflicts, in 1991 the Council of Ministers approved the “Scheme of Sustainable Use and Conservation of Peat Resources of the Republic of Belarus until 2010” (RCM 1991)¹,

which stipulated how Belarussian peatlands (all of which are in State ownership) should be used. This aimed to establish wise use of the country’s peatland resources. It covered 2,397,000 ha of studied peatlands and assigned a considerable proportion of the mires to the Nature Conservation Fund. As the “Scheme until 2010” expired, it became clear that there was a need to develop a “Strategy for the Conservation and Wise (Sustainable) Use of Peatlands”, along with a “Scheme of Distribution of Peatlands According to Their Type of Use until 2030”, referred to hereafter as ‘the Peatlands Strategy’ (or, simply, ‘the Strategy’) and ‘the Scheme’, respectively. The elaborated Strategy and Scheme were approved by resolution of the Council of Ministers of the Republic of Belarus on 30 December 2015 (RCM 2015b).

¹ A full list of legislative instruments mentioned in the text (citations beginning with DP, RCM and RSC) is provided in Table A1.1 (Appendix 1).

In this article we first give a general overview of the aims and development process of the Peatlands Strategy. We then describe the status of Belarussian peatlands as well as key problems relating to their sustainable use, present the principles and focus areas that were defined for implementation of the Strategy, and the outcome in terms of the specific prescription for peatland use that was developed. Finally, we outline the plan for implementation of the Strategy and the expected results.

GENERAL OVERVIEW OF THE STRATEGY

The National Security Concept of the Republic of Belarus (DP 2010) recognises the degradation of land, forests and natural complexes - as well as the depletion of mineral, water and biological resources - as major threats to national security. The purpose of the Peatlands Strategy is to ensure that peatlands are conserved and used in such a way and at such a rate that they will not become depleted in the long term; and thus to preserve their ability to meet the environmental, economic, aesthetic and other needs of present and future generations. To this end, it aims to balance national interests pertaining to industry on the one hand and the environment on the other, as well as to guarantee that the Republic of Belarus will fulfil its commitments under the following International Conventions and Agreements:

- Convention on Biological Diversity, signed on 05 June 1992 in Rio de Janeiro (RSC 1993);
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat adopted by the International Conference on Wetlands and Waterfowl on 02 February 1971 in Ramsar (DP 1999);
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, adopted 17 June 1994 in Paris (DP 2001);
- Convention on the Conservation of Migratory Species of Wild Animals of 23 June 1979 (DP 2003);
- Kyoto Protocol of the United Nations Framework Convention on Climate Change, adopted 11 December 1997 in Kyoto (DP 2005); and
- Convention on the Conservation of European Wildlife and Natural Habitats, signed 19 September 1979 in Bern (DP 2013).

The Peatlands Strategy and Scheme were developed by an interdepartmental group of experts

and an interdisciplinary co-ordination council. Both of these bodies were created specifically for the task, and they included representatives of all agencies and organisations dealing with the conservation and use of peatlands. The approach adopted was to:

- (i) examine the current state of peatland conservation and use in Belarus,
- (ii) on this basis identify main problems and threats, then
- (iii) develop principles and main activities to ensure sustainability of the resource.

Definitions of terms are provided in Table A1.2 (Appendix 1).

In conjunction with development of the Strategy, an inventory of the current state of peatlands was conducted and used to estimate their ecological and economic value. The data were obtained using materials from the “Scheme until 2010”, the “Peatlands of Belarus” database (SPCB 2016), interpretation of satellite imagery, and field survey. Then the data were assembled in GIS.

Using the special normative document “The Rules and Procedure for Determining How Peat Deposits and Mires are Used” (TCP 2015), every peatland in Belarus can be allocated, on the basis of type of use, to one of the following four groups (known as ‘funds’): the *Fund of Mires Subject to Special Protection*; the *Exploitation Fund* (reserved for peat extraction); the *Fund of Peatlands with Especially Valuable Peat Types* (for special biological, industrial and medicinal uses); and the *Land Fund* (peatlands used mainly for agriculture and forestry). The Scheme is the result of a redistribution of peatlands amongst these land funds according to principles and criteria developed for the Strategy, on the basis of their current state and the comments of specialists from district and regional executive committees, involved Ministers and agencies.

CURRENT STATE AND USE OF PEATLANDS

Natural mires

At present, 863,000 ha of mires are in a natural or near-natural state (Figure 2). Of this total, 540,000 ha (62 %) are already located within the boundaries of strictly protected natural areas (zapovedniks, national parks, republican reserves, local reserves) and international conservation status has been assigned to 314,000 ha of these protected peatlands. About 323,000 ha (38 %) meet the criteria for designation as typical and rare biotopes but are not yet covered by any special protection regime (Figure 3, Figure 4).

Peat extraction

The Belarussian peat industry is currently represented by 25 organisations that extract and process peat, of which 19 produce fuel peat briquettes. Another three organisations produce machines for the peat industry, as well as equipment and spare parts for these machines. Belarus is the leading world producer of traditional fuel peat briquettes, with an annual production of 0.82–1.36 million tonnes during the five years 2011–2015. The briquettes are used by public utilities, and considerable quantities (200,000–450,000 tonnes *per* year) are exported to European Union (EU) countries. In addition, approximately 100,000 tonnes (about 500,000 m³) of bog peat in sacks (mainly for export), 10,000–15,000 tonnes of sod peat (for the domestic market), and 10,000–20,000 tonnes of peat soil (predominantly for the domestic market) are produced annually. The major users of peat fuel are Zhodino Combined Heat and Power Plant (CHPP), Bobruisk CHPP-1, Rechitsa CHPP, and Osipovich mini CHPP (Gavrilchik *et al.* 2012, Kozulin *et al.* 2017).

Since commercial exploitation of peat deposits began in Belarus, approximately 300,000 ha of mire have been drained for peat extraction (Figure 5).

Most of this area (about 281,500 ha) has now been withdrawn from commercial exploitation, leaving only 17,600 ha still allocated for this purpose. Further peat extraction and use will be determined by the future demand for high-level processed raw peat and the needs of the energy and utilities sectors, the cement industry and agriculture, as well as on the business trends of the international markets in fuel and horticultural peat.

Agriculture

The total area of drained land with peat soils that is used in agriculture is 1,068,200 ha, including 122,200 ha of peat workings which have revegetated after peat extraction ceased. Investigations so far have shown that 258,800 ha of these peat soils have lost their genetic traits, and they have been transferred to the category ‘human modified’. This area includes 190,200 ha of degraded peat soils with >50 % loss of organic matter. Thus, according to preliminary data, approximately 750,000 ha of drained land with peat soils are now used effectively for agriculture, and around 250,000 ha are either used ineffectively for this purpose or have been transferred to other types of use.

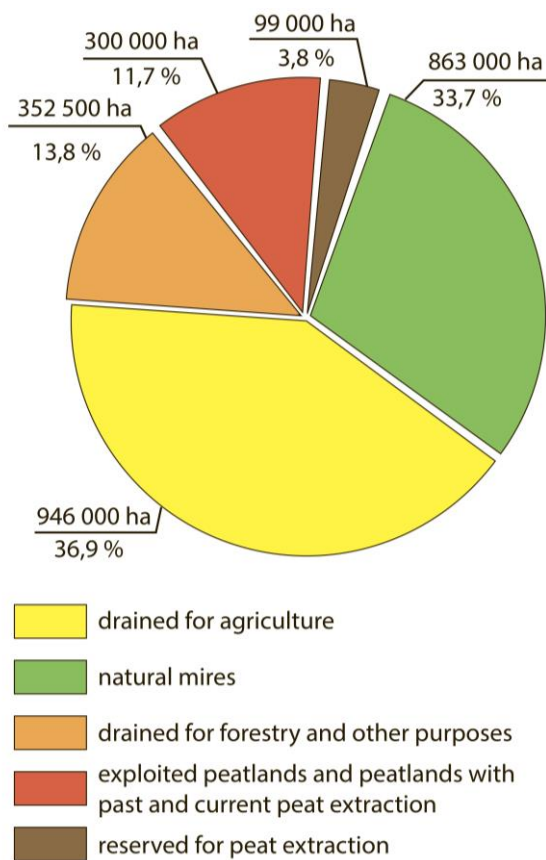


Figure 2. The current state of peatlands in Belarus according to SPBC (2016).

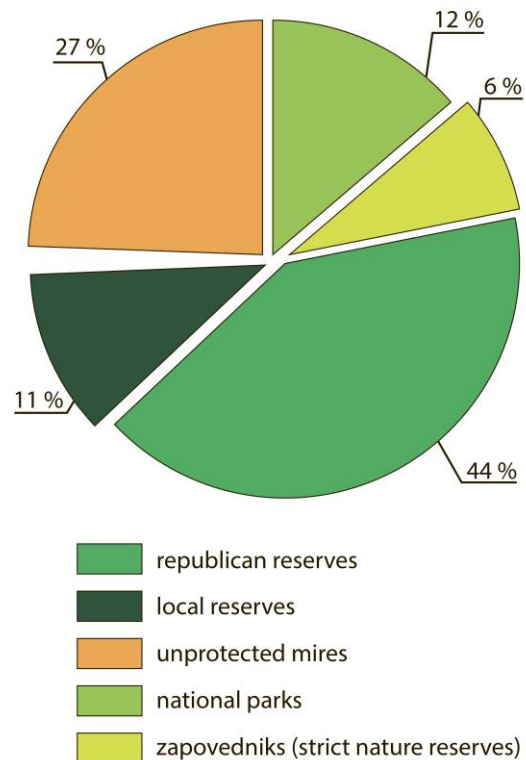


Figure 3. Protection status of the 863,000 ha of natural mires in Belarus.

Approximately 96 % of the peatlands that have been drained for agriculture were originally fens, and 4 % were raised bogs and transitional mires. About 30 % of the agriculturally-used peatland area is under arable crops and about 70 % is meadow. On over 70 % of the total area of drained land with peat soils, the thickness of the peat layer is one metre or less; and on more than 90 % of the same total area the peat is underlain by sand, the remainder being underlain by sandy clay and clay loam.

Forestry

Between 1960 and 1980, hydrotechnical amelioration (drainage) of 304,000 ha of forested mire was conducted to improve timber productivity, and a positive effect was achieved on 43 % of the total area drained. On the other 57 % (including all of the raised bogs, which cover ~9 % of the total area drained), there was either no increase in timber production or

the effect was insignificant. Ineffectively drained forested peatlands suffer degradation, and the risk of fire is increased. During the period 2010–2014, 79,270 ha of forest hydrological amelioration systems were decommissioned because they were economically and environmentally ineffective.

KEY PROBLEMS

The key impediments to achieving the conservation and wise (sustainable) use of peatlands in Belarus can be summarised as follows:

- disturbance of the hydrological regimes of mires (total area approximately 516,000 ha) by canal networks that were installed to drain adjoining land (*e.g.*, forest hydrological amelioration systems and peat extraction fields);

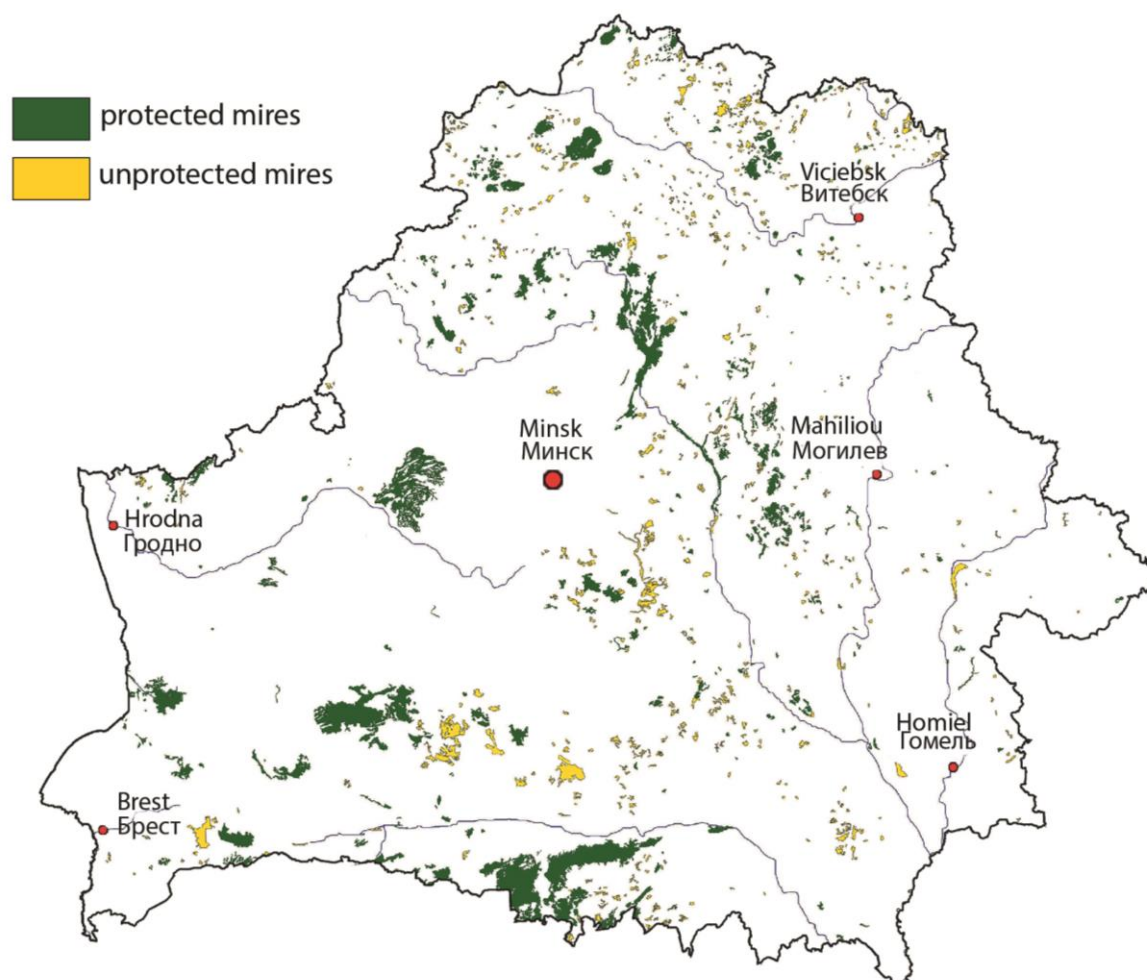


Figure 4. Map of Belarus showing the distributions of protected and unprotected mires. The total area of mires is 863,000 ha, of which 540,000 ha are located within protected areas.

- forest, shrubs and reeds overgrowing open mire ecosystems when traditional land uses are discontinued, with associated eutrophication of surface waters and disturbance of the hydrological regime;
- peat extraction on mires which are in a natural or near-natural state;
- insufficient consideration of the agricultural and environmental state (especially soil moisture content) of peatland when planning where arable and other crops will be grown, and the consequent intensive loss of organic matter resulting from ploughing of approximately 318,100 ha of land with peat soils;
- the presence of about 190,200 ha of degraded agricultural land with peat soils and 281,500 ha of peat deposits where commercial peat extraction has ceased;
- annual peat consumption being 12 times the annual growth increment of new peat - the annual loss of peat due to agricultural use and peat extraction is 12.8 million tonnes *per* year, whereas the annual accumulation of peat in mires is just 1.04 million tonnes;
- the release of 16.7 million tonnes of CO₂ (4.45 million tonnes of carbon) into the atmosphere from peatlands each year, while mires absorb only 0.9 million tonnes of CO₂ (0.23 million tonnes of carbon) during the same period;
- inefficient use of the biological resources (cranberries, plant biomass) of mires;
- peat fires; and
- the unfavourable drainage effect of canals on raised bogs with deep cottongrass and *Sphagnum* peats, and on hydromorphic mineral soils with low organic content carrying black alder plantations, which arises because the canals were constructed (for forest amelioration purposes in 1960–1980) without systems for regulating water levels on the forest land that they drain.

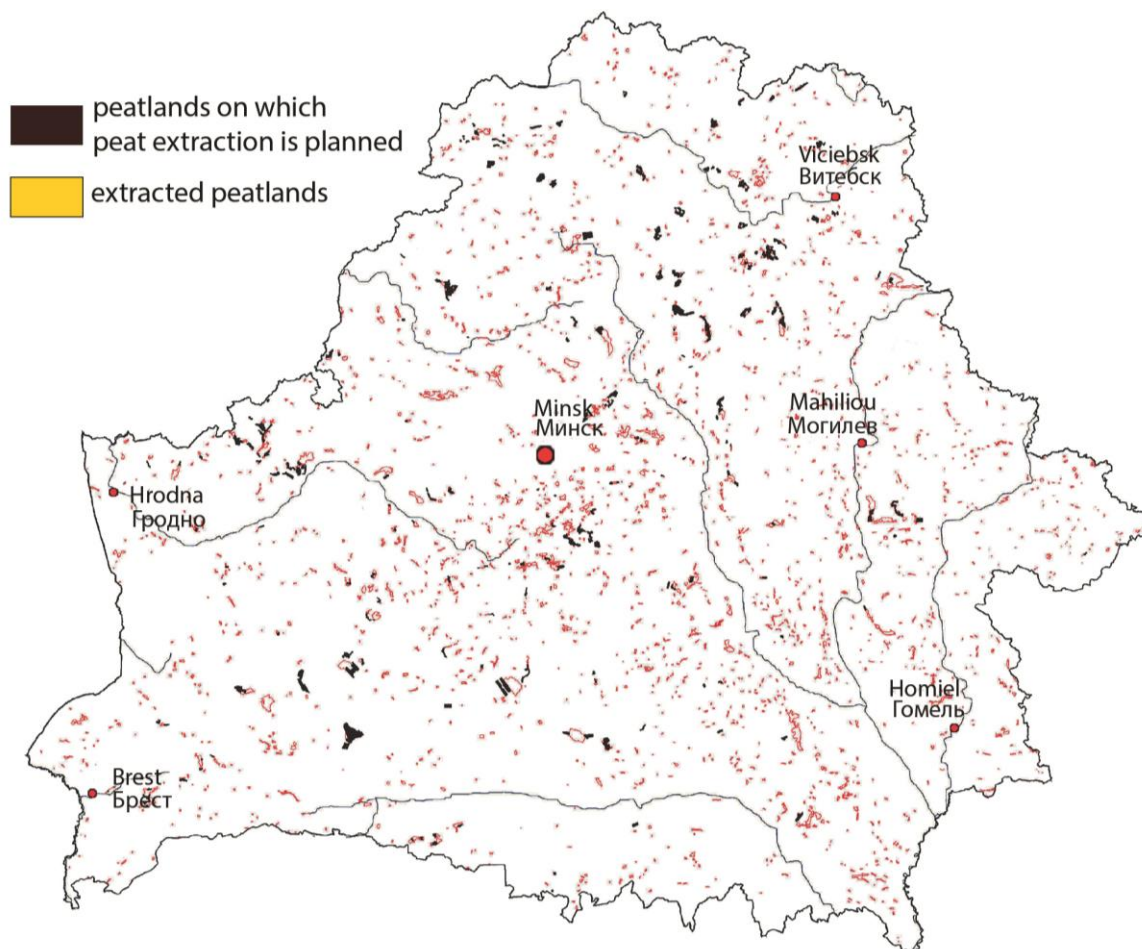


Figure 5. Map of Belarus showing the distributions of extracted peatlands and peatlands on which peat extraction is planned. Approximately 300,000 ha of mire have been drained for peat extraction (extracted peatlands) and 99,000 ha will be used for peat extraction before 2030. The total area of worked-out peatlands is 284,800 ha, of which 143,400 ha are subject to environmental rehabilitation.

PRINCIPLES AND FOCUS AREAS OF THE STRATEGY

The key principles for implementation of the Strategy are:

1. to strictly conserve mires that are still in a natural or near-natural condition;
2. to extract peat mainly from deposits that are already influenced by a network of drainage canals or ineffectively drained for forestry or agriculture, where restoration of the hydrological regime is impossible or inexpedient;
3. to conduct agriculture on peat soils using approaches and methods that ensure minimum loss of organic matter and preserve soil fertility; and
4. to initiate environmental rehabilitation of disturbed peatlands that can no longer be effectively used for (consumptive) commercial purposes.

On this basis, four focus areas for implementation of the Strategy have been identified (see below). It will also be necessary to improve peatland accounting systems so that the situation can be monitored effectively.

Natural mires

The following specific measures will be taken to secure the conservation and sustainable use of mires that are still in a natural or near-natural condition:

- designation of unique, model and other valuable mire ecosystems as strictly protected natural areas;
- identification of rare and typical mire biotopes that can be protected through transfer to land and/or water users;
- sustainable management of both strictly protected natural areas and transferred rare/typical biotopes;
- development of ecotourism based on mires, including establishment of the necessary infrastructure; and
- effective use of the biomass of mire plants (paludiculture).

Other measures envisaged by the “Strategy for the Conservation and Sustainable Use of Biological Diversity for 2011–2020” (RCM 2010) and the “National Strategy for the Development of the System of Strictly Protected Natural Areas until January 1, 2030” (RCM 2014) will also be implemented.

Rehabilitation

The target that has been set for environmental rehabilitation is to recover at least 15 % of the total area of disturbed peatlands. Some rehabilitation measures are already envisaged by the “Strategy for the Conservation and Sustainable Use of Biological Diversity for 2011–2020” (RCM 2010) and the “Strategy for the Implementation of the United Nations Convention to Combat Desertification” (RCM 2015a). New initiatives under the Peatlands Strategy will change the designated uses of mires that have been ineffectively drained for hydrological amelioration of forest; and seek improved methods for accelerating the restoration of degraded mire ecosystems, for example by actively introducing mire plants.

Agriculture

The use of drained agricultural land with peat soils will be optimised by growing (predominantly) perennial grasses for high-quality fodder, rather than arable and other crops that require intense drainage and/or annual cultivation, thus reducing losses of organic matter. Moreover, agricultural drainage networks will be modified to prevent negative impacts on the hydrological regimes of adjacent natural ecosystems, and contamination of water bodies by agricultural runoff will be avoided. Some of the activities envisaged by the ‘Strategy for the Implementation of the United Nations Convention to Combat Desertification’ (RCM 2015a) will also be relevant.

Peat extraction

The Belarussian peat industry will be made more ‘eco-friendly’ through a range of measures. The planning process for peat extraction will be modified so as to achieve a gradual transition to using (mostly) disturbed and ineffectively drained peatlands for this purpose, and actions will be taken to minimise the adverse effects of peat extraction on the hydrological regimes of adjacent natural ecosystems. A gradual and cost-efficient increase in multipurpose utilisation of peat will be sought, with improvements to peat processing methods for producing goods with high added value. The intention is to diversify peat production to include the manufacture of activated coals, sorbent agents, humates, pelleted fertilisers and other products of high-level processing, with a focus on light-duty production works that do not require the development and exploitation of large peat deposits.

ALLOCATIONS TO THE LAND FUNDS

Elaboration of the Scheme for the 15-year period until 2030 was based on the key principles for implementation of the Strategy outlined above. The different types and locations of peatland use envisaged are as follows:

- conservation of the mires designated for strict and/or special protection in their natural state (*Fund of Mires Subject to Special Protection*);
- conservation of the peat deposits and mires (or portions thereof) included in the *Fund of Peatlands with Especially Valuable Peat Types*, which may only be used for extraction of low-humification raised bog peat, bituminous peat for biological and thermochemical processing, or raw materials for medicinal products;

- use of the peat deposits (or portions thereof) included in the *Exploitation Fund* for commercial peat extraction;
- use of peatlands included in the *Land Fund* for agriculture, forestry and other types of economic activity.

Of the 863,000 ha of peatlands identified as being in a natural or near-natural state, almost all mires that have been confirmed still to be in natural (pristine) condition are allocated by the Scheme to the *Fund of Mires Subject to Special Protection*. The total area of mires thus allocated is 684,200 ha (~4 % of the country; Bambalov *et al.* 2017), or 29 % of the total area of Belarussian peatlands (Figure 6, Table A2.1 in Appendix 2). The peat deposits of these mires have accumulated 7,916.4 million cubic metres of water and 489.5 million tonnes of carbon (Table A2.2);

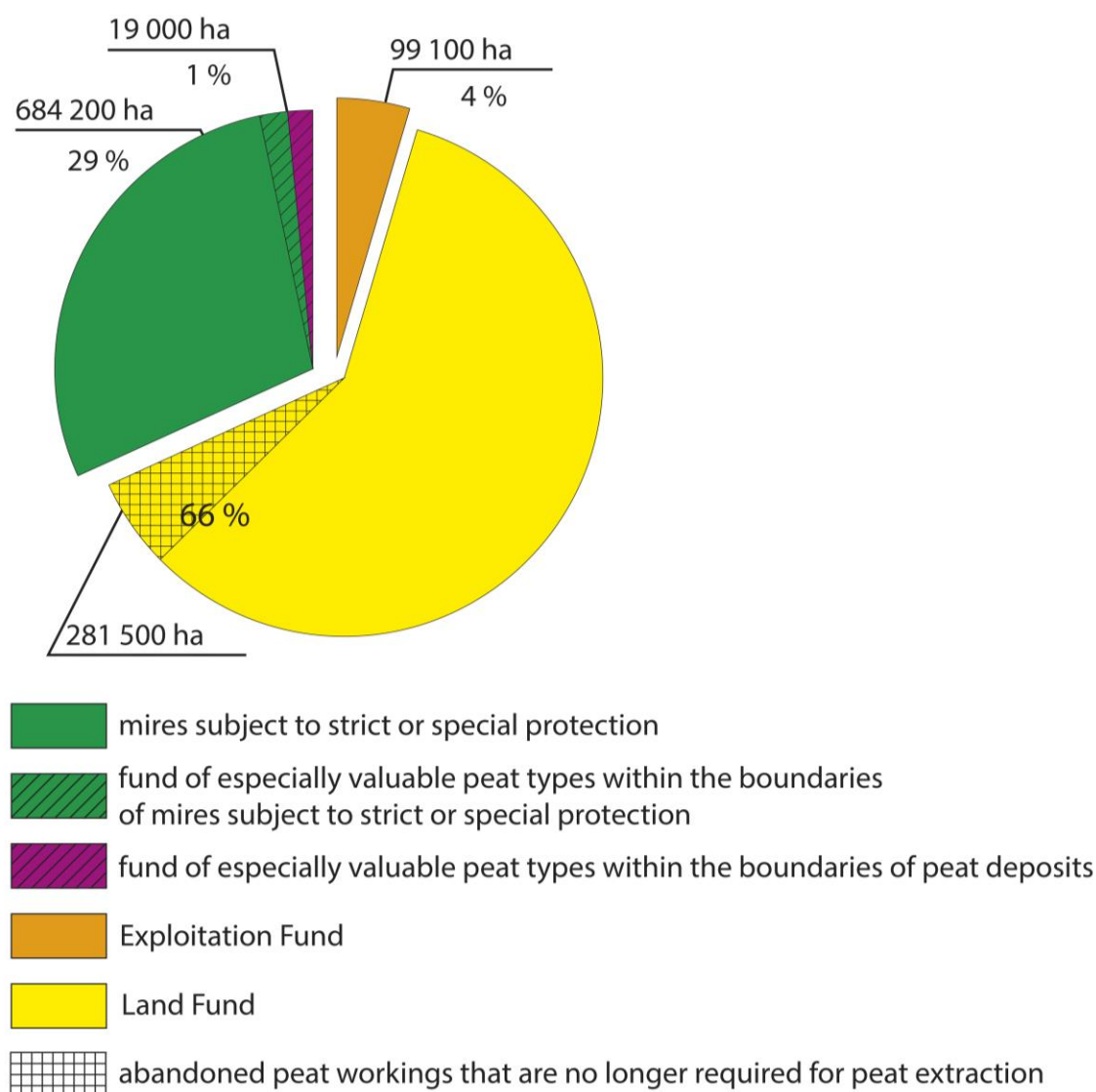


Figure 6. Summary of the allocation of Belarussian peatlands amongst the land funds, according to the ‘Scheme until 2030’. See also Table A2.3 (in Appendix 2).

and every year they remove approximately 900,000 tonnes of carbon dioxide from the atmosphere and release 630,000 tonnes of oxygen.

According to the Scheme, there are 8,533 land parcels on peatlands whose individual extents exceed 10 ha. Their total area is 2,381,700 ha or 11.5 % of the Republic's territory, and their geological peat reserves amount to 4.0 billion tonnes. The Scheme allocates peat reserves within the commercially viable depth range as follows: 43.7 million tonnes to the *Fund of Peatlands with Especially Valuable Peat Types*, 302.1 million tonnes to the *Exploitation Fund*, and 2,135.4 million tonnes (including peat deposits withdrawn from commercial exploitation) to the *Land Fund* (Table A2.3). The total area of mires and peat deposits allocated to the *Fund of Peatlands with Especially Valuable Peat Types* is 19,600 ha (1 %), including 13,800 ha which is subject to strict and/or

special protection (Table A2.4). The *Exploitation Fund* (peatlands used for peat extraction) is mainly comprised of drained and ineffectively used peatlands. Their total area is 99,141 ha (4.1 % of the total peatland area) and they provide a commercial peat reserve of 302.1 million tonnes (Figure 5, Table A2.5). Finally, the *Land Fund* includes 1,592,600 ha of peatlands (66.8 % of the total area of all peatlands) with peat reserves of 2,135.4 million tonnes (53 % of all peat reserves) (Tanovitskaya *et al.* 2016).

The distribution of peatlands allocated for protection, peat extraction (*Exploitation Fund*) and agriculture/forestry (*Land Fund*) across the country is shown in Figure 7. Larger-scale maps showing the distribution of peatlands allocated to each type of use have been prepared for all 120 of the administrative districts within Belarus. Examples of these district maps are shown in Figures 8 and 9.

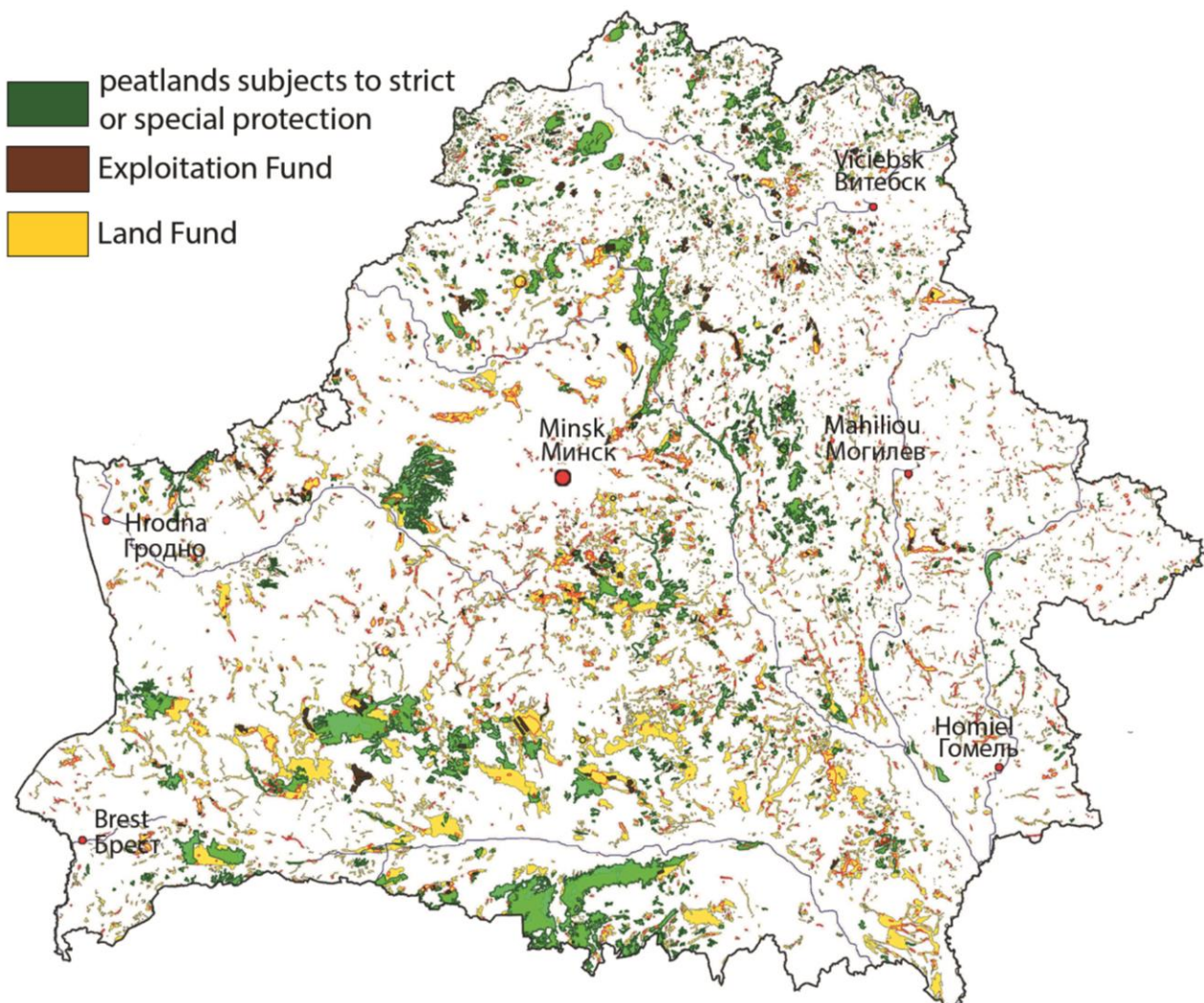
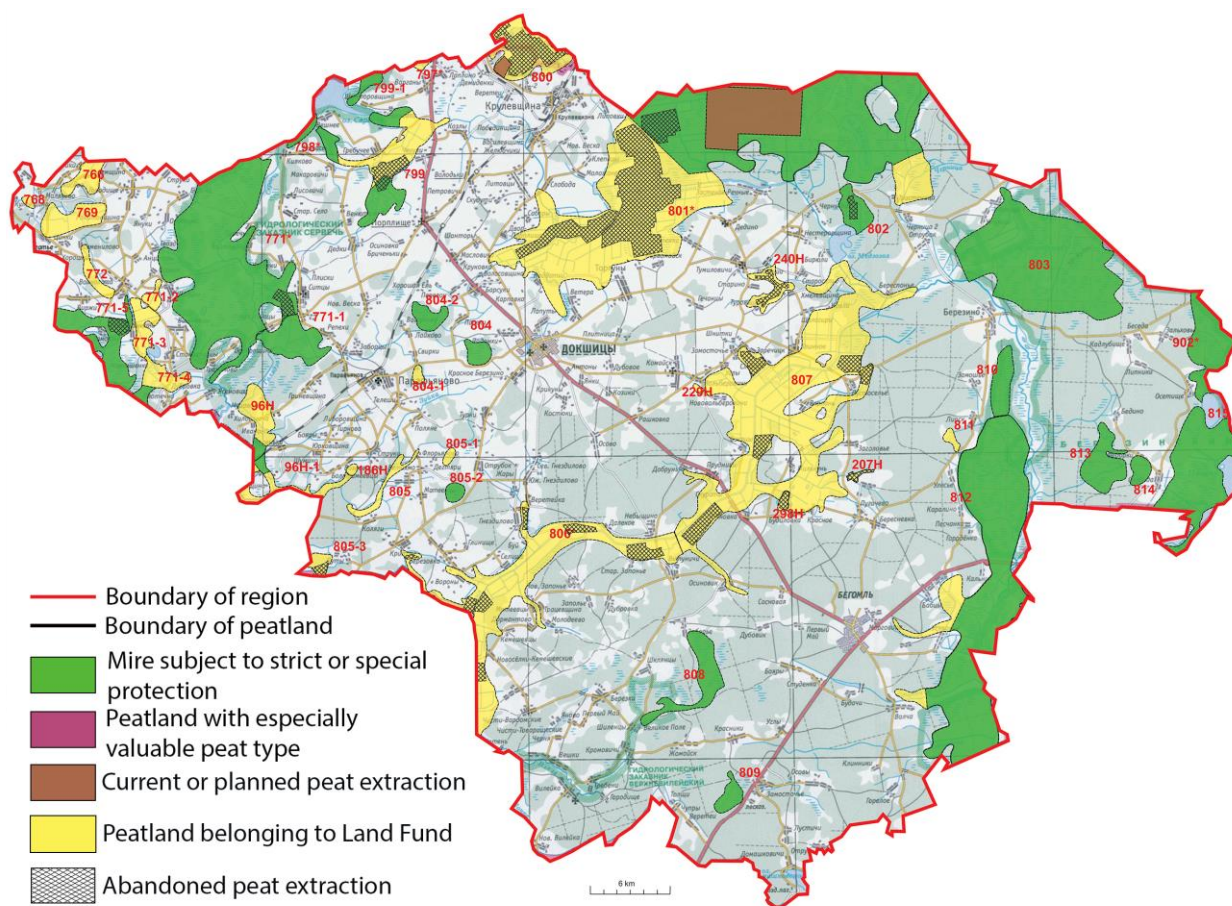


Figure 7. Map of Belarus showing the distribution of peatlands as allocated amongst the three main land funds by the 'Scheme until 2030', based on the principles set out in the Strategy and the descriptions of their current state.



Cadaster number	Name of peatland	Area in zero borders, ha	Mire of special and (or) specific protection, ha	Fund of especially valuable type of peats, ha	Peat extraction fund, ha	Land fund, ha
186H	Прогресс	10	0	0	0	10
207H	Залядье	46	0	0	0	46
229H	Вальберовичи	14	0	0	0	14
240H	Шалаша	242	0	0	0	242
298H	Будиловка	40	0	0	0	40
766	Осиновское	223	0	0	0	223
768	Маляково	60	0	0	0	60
769	Загаце	443	0	0	0	443
771*	Сервечь	4900	4900	0	0	0
771-1	Б.Ситце	800	800	0	0	0
771-2	Шильки	95	0	0	0	95
771-3	Вишневы	230	0	0	0	230
771-4	Матюшенки	520	150	0	0	370
771-5	Виржи	695	695	0	0	0
772	Волколата	106	0	0	0	106
797*	Киселе	50	0	0	0	50
798*	Добряково	217	217	0	0	0
799	Райувка	1196	643	0	0	553
799-1	Шанторовщина	200	200	0	0	0
800	Рамжино	1021	0	0	48	973
801*	Журавлевское	13869	7607	0	1702	4560
802	Зеленое	321	321	0	0	0
803	Жары	4819	4819	0	0	0
804	Азарце	173	173	0	0	0
804-1	Свирки	70	0	0	0	70
804-2	Лайково	250	250	0	0	0
805	Коляги	126	0	0	0	126
805-1	Флорьяново	50	0	0	0	50
805-2	Отрубок	120	120	0	0	0
TOTAL		49188	31464	0	1750	15974

Figure 8. Map showing the distribution of peatlands allocated to each type of use in Dokshitsy district of Vitebsk region.

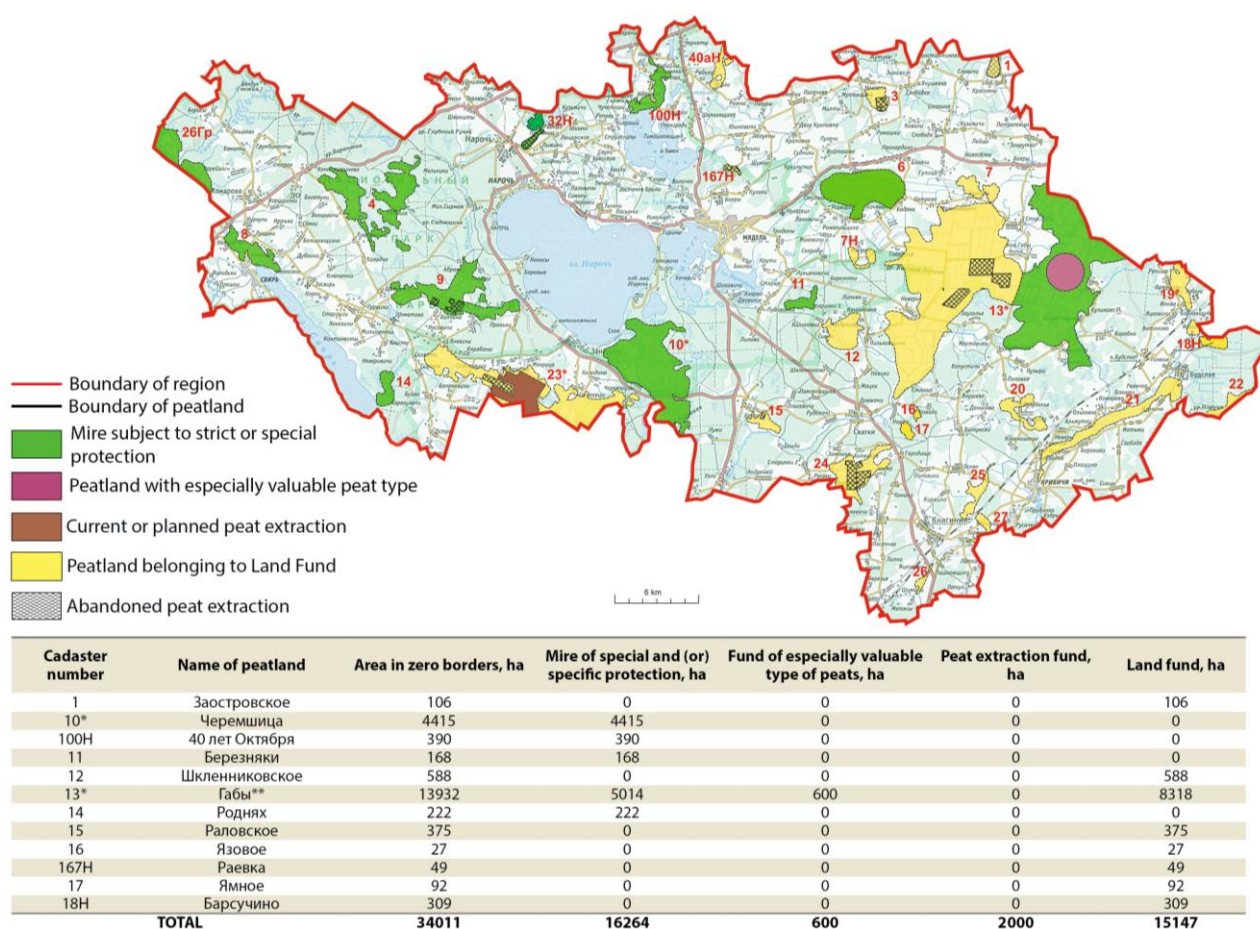


Figure 9. Map showing the distribution of peatlands allocated to each type of use in Myadel district of Minsk region.

IMPLEMENTATION AND EXPECTED RESULTS

The Strategy will be implemented through partnerships and co-operations between national government bodies, local executive and administrative bodies, research institutions and other organisations, with a clear division of powers and responsibilities. The key objective will be to faithfully implement the “Scheme until 2030” by undertaking the appropriate activities under state-funded programmes pertaining to nature conservation and wise use of natural resources, with international technical assistance as well as additional funding from alternative sources that are not prohibited by Belarussian legislation. A fully successful implementation will result, by 2030, in an optimised structure of agriculture on peat soils, with the area under perennial grasses increased to one million hectares, and effective use of all land that remains under drainage for forest amelioration. The peat industry will be undergoing a gradual and cost-efficient transformation towards a more sustainable

mode of operation, offering consumers a full range of peat products with an increasing share of these being derived by high-level processing of peat from light-duty extraction works. The associated outcomes for conservation and other non-consumptive uses of peatlands are envisaged as follows:

- preservation of 684,000 ha of mires in their natural state, together with investigation of a further 179,000 ha of possible mires and determination of measures to ensure their conservation;
- restoration of at least 15 % (at least 75,000 ha) of the present area of disturbed peatlands (depleted parts of peat deposits, degraded land with peat soils, mires ineffectively drained by forest amelioration schemes);
- preservation in mires of over 7 billion m³ of fresh water and assured water supplies for rivers and lakes;
- preservation in mires of approximately 500 million tonnes of carbon;

- annual removal from the atmosphere of approximately 900,000 tonnes of carbon dioxide and release into the atmosphere of 630,000 tonnes of oxygen by natural mires;
- conservation of wildlife habitats, as well as >40 % of the bird species, 35 % of the insect species and >15 % of the wild plants listed in the Red Data Book of the Republic of Belarus;
- an assured cranberry harvest of approximately 10,700 tonnes every year;
- methods for efficient use of the plant biomass of mires developed and implemented;
- technology for accelerated conversion of degraded peatlands into open sedge fen mires developed and implemented;
- breeding grounds for game animals (elk, capercaillie, black grouse) preserved;
- an ecotourism industry oriented around the recreational potential of mires; and
- a 15 % reduction in the area of land at high risk of fire, achieved through environmental rehabilitation of disturbed and ineffectively used peatlands.

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Appendix 1: Legislative instruments and definitions

Table A1.1. Legislative instruments mentioned in the text.

Citation in text	Legislative instrument
DP (1999)	Decree of the President of the Republic of Belarus of May 25, 1999 № 292 "On the Legal Succession of the Republic of Belarus Regarding the Convention on Wetlands of International Importance Especially as Waterfowl Habitat". <i>National Register of Legal Acts of the Republic of Belarus</i> , 1999, No. 41, 1/377.
DP (2001)	Decree of the President of the Republic of Belarus of July 17, 2001 № 393 "On the Accession of the Republic of Belarus to the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa". <i>National Register of Legal Acts of the Republic of Belarus</i> , 2001, No. 68, 1/2855.
DP (2003)	Decree of the President of the Republic of Belarus of March 12, 2003 № 102 "On the Accession of the Republic of Belarus to the Convention on the Conservation of Migratory Species of Wild Animals". <i>National Register of Legal Acts of the Republic of Belarus</i> , 2003, No. 32, 1/4443.
DP (2005)	Decree of the President of the Republic of Belarus of August 12, 2005 № 370 "On the Accession of the Republic of Belarus to the Kyoto Protocol to the United Nations Framework Convention on Climate Change". <i>National Register of Legal Acts of the Republic of Belarus</i> , 2005, No. 128, 1/6695.
DP (2010)	Decree of the President of Belarus No. 575 of November 9, 2010 № 575 "On the Adoption of the National Security Concept of the Republic of Belarus". <i>National Register of Legal Acts of the Republic of Belarus</i> , 2010, No. 276, 1/12080.
DP (2013)	Decree of the President of the Republic of Belarus of February 7, 2013 № 70 "On the Accession of the Republic of Belarus to the Convention on the Conservation of European Wildlife and Natural Habitats". <i>National Legal Internet Portal of the Republic of Belarus</i> , 09.02.2013, 1/14069.
RCM (1991)	"The Scheme of Sustainable Use and Conservation of Peat Resources of the Republic of Belarus until 2010" adopted by the Resolution of the Council of Ministers of the Republic of Belarus № 440, dated November 25, 1991. <i>SP of the Republic of Belarus</i> , 1991, No. 33, Article 404.
RCM (2010)	"Strategy for the Conservation and Sustainable Use of Biological Diversity for 2011–2020" adopted by the Resolution of the Council of Ministers of the Republic of Belarus of November 19, 2010 № 1707 "On Some Issues Regarding Conservation and Sustainable Use of Biological Diversity". <i>National Register of Legal Acts of the Republic of Belarus</i> , 2010, No. 287, 5/32887.
RCM (2014)	"National Strategy for the Development of the System of Strictly Protected Natural Areas until January 1, 2030", adopted by the Resolution of the Council of Ministers of the Republic of Belarus of July 2, 2014 № 649 "On the Development of the System of Strictly Protected Natural Areas". <i>National Legal Internet Portal of the Republic of Belarus</i> , 11.07.2014, 5/39101.
RCM (2015a)	"Strategy for the Implementation of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa" approved by the Resolution of the Council of Ministers of the Republic of Belarus № 361 dated 29.04.2015 "On Some Issues of Preventing Land Degradation (Including Soils)". <i>National Legal Internet Portal of the Republic of Belarus</i> , 06.05.2015, 5/40478.
RCM (2015b)	"Strategy for the Conservation and Wise (Sustainable) Use of Peatlands of the Republic of Belarus" and "Scheme of the Distribution of Peatlands According to Their Type of Use until 2030", approved by the Resolution of the Council of Ministers of the Republic of Belarus № 11116 dated 30.12.2015.
RSC (1993)	Resolution of the Supreme Council of the Republic of Belarus of June 10, 1993 "On Ratifying the Convention on Biological Diversity". <i>Bulletin of the Supreme Council of the Republic of Belarus</i> , 1993, No. 27, Article 347.

Table A1.2. Definitions of key terms used in the Strategy and the Scheme.

- a **mire** is an area of permanently waterlogged terrain covered with hygrophilous plants, where the process of peat formation and deposition is in progress.
- a **fen mire** is a peatland formed under conditions of rich water and mineral supply (60–400 mg L⁻¹ of dissolved mineral salts) coming from groundwater or river water and atmospheric precipitation.
- a **raised bog** is a peatland formed under conditions of water and mineral supply coming from atmospheric precipitation containing less than 50 mg L⁻¹ of dissolved mineral salts.
- a **transitional mire** is a peatland formed under conditions of mixed water and mineral supply (40–80 mg L⁻¹ of dissolved mineral salts) coming from atmospheric precipitation, surface water runoff and partially from groundwater.
- a **disturbed peatland** is a peatland where the natural state of the peatland ecosystem (flora, fauna, groundwater level, hydrological regime, peat forming and peat accumulation processes) have changed as a result of its drainage for use in agriculture, forestry, peat extraction or for other purposes, peat burning out during peat fires, as well as due to drainage or other works on the adjacent territories.
- **drained lands with peat soils** are lands with one or several peat layers in their soil profiles, where drainage has been conducted.
- **wise (sustainable) use of peatlands** is exploiting peatlands in such a way and at such a rate that, in the long term, does not cause their depletion and thus makes it possible to preserve their ability to meet the environmental, economic, aesthetic and other needs of the present generation and generations to come.
- **peat** is organogenous material which is formed as a result of dying off and incomplete decay of mire plants under conditions of permanent waterlogging with oxygen deficiency, and which contains not more than 50 % of mineral components on a dry mass basis;
- a **peatland** is an area of land covered with a layer of peat, which was formed by the process of natural peat formation, whether in a natural or a drained state. This term includes such concepts as 'mire', 'peat deposit', and 'drained lands with peat soils'.
- a **peat deposit** is a geological formation consisting of layers of one or several peat types, characterised in its natural state by excessive moisture and distinctive vegetation cover, which is suitable for commercial and/or other economic use on the basis of size of the peat reserve and quality of the peat.
- **environmental rehabilitation** of disturbed peatlands is an activity intended to restore the ability of the peatlands to fulfil their biosphere functions.

Appendix 2: Outline of the distribution of peatlands *per* type of use until 2030

APPROVED

Resolution of the Council of Ministers of the Republic of Belarus

30.12.2015 No. 1111

Note: In all cases, cadastre numbers follow “The Cadastre Directory of the Peat Fund of BSSR” (1979).

Table A2.1. Example data on peatlands/portions of peatlands (each represented as a single land parcel in the GIS system) which are subject to strict and/or special protection (breakdown according to administrative districts). Data for three of the 16 districts of Brest Region are shown, along with total areas for the 120 districts (in six regions) that make up the whole of Belarus.

Names of example districts	Total area of peatland parcels (ha)	(Peat)land parcels that are already subject to strict and/or special protection regimes		(Peat)land parcels for which strict and/or special protection regimes are planned	
		cadastre numbers	area (ha)	cadastre numbers	area (ha)
Brest Region					
Beryoza	10,238	119, 126, 130	9,449	127, 128	789
Gantsevichi	23,575	144, 145, 146, 153, 161, 164, 165, 166	10,254	145, 146, 150, 152, 153, 154, 155, 156, 159, 164, 165, 166, 167, 388, 397, 398, 399	13,321
Drogichin	13,920	126, 130, 249, 257, 302, 303	8,951	128, 249, 280, 305	4,969
Total areas for 120 districts					
Totals	684,226		461,859		222,367

Table A2.2. Breakdown *per* region of (peat)land parcels (whole peatlands or portions of peatlands) which are subject to strict and/or special protection.

Region	Number of peatland parcels	Area of peatland (thousand ha)	Carbon reserve (thousand tonnes)	Water reserves (thousand m ³)
Brest	103	162.7	84,722	1,303,394
Vitebsk	509	203.1/5.3*	212,965	3,649,393
Gomel	198	138.9	81,600	1,256,883
Grodno	48	26.1	14,020	230,223
Minsk	181	99.5/4.8*	63,785	977,408
Mogilev	187	53.9/3.7*	32,454	499,122
Total	1,226	684.2/13.8*	489,546	7,916,423

* The first figure is the total area, and the figure that follows ‘/’ is the included area that is part of the *Fund of Peatlands with Especially Valuable Peat Types*.

Table A2.3. Reserves of peatlands with especially valuable peat types, for exploitation (peat extraction), and as land resources (breakdown *per* region).

Region	Number of peat deposits	Total area of peat deposits (thousand ha)	Peat reserves which could be used for commercial extraction at the date of prospecting (thousand tonnes)	Peat reserves which could be used for commercial extraction at 01 Jan 2013 (thousand tonnes)	Peatlands with especially valuable peat types		Peatlands available for exploitation (peat extraction)		Land resources			
					thousand ha	thousand tonnes	thousand ha	thousand tonnes	total		including peat deposits no longer used commercially at 01 Jan 2013	
									thousand ha	thousand tonnes	thousand ha	extracted, thousand tonnes
Brest	483	326.9	707,167	310,417	-	-	19.1	55,959	307.8	254,458	41.5	133,250
Vitebsk	2,729	223.4/ 5.3*	599,104/ 13,504*	421,567	6.0/ 5.3*	15,828/ 13,504*	34.0	114,579	183.4	304,664	48.2	116,311
Gomel	1,193	347.1	649,451	447,346	0.4	481	3.8	11,099	342.9	435,766	41.2	103,807
Grodno	382	144.4	370,965	188,396	0.1	140	12.3	31,168	132.0	157,088	28.4	82,737
Minsk	1,183	507.6/ 4.8*	1,401,077/ 12,253*	906,830	9.1/ 4.8*	18,924/ 12,253*	26.6	82,381	471.9	817,778	88.8	424,906
Mogilev	1,337	161.9/ 3.7*	329,420/ 7,817*	173,090	4.0/ 3.7*	8,354/ 7,817*	3.3	6,938	154.6	165,615	33.4	74,836
Totals	7,307	1,711.3/ 13.8*	4,057,184/ 33,574*	2,447,646	19.6/ 13.8*	43,727/ 33,574*	99.1	302,124	1,592.6	2,135,369	281.5	935,847

* The first figure is the total area, and the figure that follows ‘/’ is the included area that is part of the *Fund of Mires Subject to Special Protection*.

Table A2.4. Example data *per* district for (peat)land parcels with especially valuable peat types; in this case as raw material for bitumen production.

Region	District	Cadastr numbers of (peat)land parcels with especially valuable peat types	Area of (peat)land parcels with especially valuable peat types (ha)	Reserves of especially valuable peat types which could be used for commercial mining as of 01 Jan 2013 (thousand tonnes)
Vitebsk	Tolochin	1697	406/406*	1,175/1,175*
Minsk	Krupki	368	176/176*	223/223*
	Minsk	504	275	660
Total in Belarus			19,654/13,891*	43,727/33,574*

* The first figure is the total area, and the figure that follows ‘/’ is the included area that is part of the *Fund of Mires Subject to Special Protection*.

Table A2.5. Example data *per* district for (peat)land parcels that belong to the *Exploitation Fund* (reserved for peat extraction).

Region	District	Cadastr numbers of (peat)land parcels	Total area of (peat)land parcels (ha)	Peat reserves which could be used for commercial extraction as of 01 Jan 2013 (thousand tonnes)
Brest	Baranovichi	8	327.7	913.3
		21	292.0	727.0
		30	180.0	450.0
		34	186.8	449.3
		35	18.0	448.0
	Drogichin	261	246.0	457.0
	Zhabinka	215 n	144.0	67.0
		239	214.5	194.7
Total in Belarus			99,140.7	302,124.1