



**BIAŁOWIEŻA
FOREST**

BIAŁOWIEŻA FOREST WORLD HERITAGE SITE MANAGEMENT PLAN (POLISH PART)

*“... parts of the cultural or natural heritage
are of outstanding interest and therefore need to be preserved
as part of the world heritage of mankind as a whole”*

*“... deterioration or disappearance of any item
of the cultural or natural heritage constitutes
a harmful impoverishment of the heritage of all the nations of the world”*

Convention concerning the protection of the world cultural and natural heritage,
adopted in Paris on 16 November 1972.

List of contents

1. Introduction	12
1.1 Basis for the development of the Plan and its purpose	12
1.2 Methodology	13
1.3 Stakeholders	17
1.4 Plan structure.....	19
2. The Site and its significance.....	21
2.1 Characteristics of the Białowieża Forest Site.....	21
2.1.1 Location	21
2.1.2 Natural environment	22
2.1.3 Scientific studies	25
2.1.4 History.....	28
2.1.5 Cultural heritage	30
2.1.6 Local community.....	31
2.2 Forms and methods of nature conservation	36
2.2.1 Białowieża National Park	36
2.2.2 Nature reserves	38
2.2.3 Protected Landscape Area.....	38
2.2.4 Natura 2000 areas	39
2.2.5 Species protection	41
2.2.6 Biosphere Reserve	42
2.2.7 “Białowieża Forest” Promotional Forest Complex	42
2.3 Outstanding Universal Value	44
2.3.1 Białowieża Forest as an example of unique ecological processes (Criterion IX)	44
2.3.2 The Białowieża Forest as an area of the most significant and important natural habitats for in-situ biodiversity conservation (Criterion X)	45
2.3.3 Integrity of the Białowieża Forest.....	46
3. Threats and barriers	48
3.1 Threats	48
3.2 Barriers.....	55
4. Management strategy	59
4.1 Adaptive management as a way to achieve the objectives.....	59
4.2 Vision.....	60

4.3	Objectives.....	61
4.4	Results.....	62
5.	Directions and measures.....	65
5.1	Directions and measures developed in a participatory manner.....	65
5.2	Summary of expert recommendations.....	118
6.	Management instruments.....	127
6.1	Measures coordination system.....	127
6.2	Legal instruments.....	130
6.3	Financial instruments.....	134
6.4	Zoning.....	136
7.	Monitoring.....	143
7.1	Long-term monitoring program.....	143
7.2	Supervision of the implementation of the Plan.....	144
8.	Literature and materials used.....	151
8.1	Literature.....	151
8.2	Websites.....	167
9.	List of tables and figures.....	169
9.1	List of tables.....	169
9.2	List of figures.....	169
10.	List of annexes.....	170
11.	Glossary.....	171

List of abbreviations and acronyms

Abbreviation	Meaning
BPN	Białowieża National Park
BULiGL	Bureau for Forest Management and Geodesy
Property	Białowieża Forest World Heritage Site, used interchangeably with "Site"
GDOŚ	General Directorate for Environmental Protection
GIOŚ	Chief Inspectorate for Environmental Protection
GUGiK	Head Office of Geodesy and Cartography
GUS	Statistics Poland
IBL	Forest Research Institute
IOŚ-PIB	Institute of Environmental Protection – National Research Institute
IUCN	<i>International Union for Conservation of Nature</i>
Convention	Convention concerning the protection of the world cultural and natural heritage adopted in Paris on 16 November 1972 by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) at its seventeenth session
KSOch	National System of Protected Areas
LKP	Promotional Forest Complex
MKiŚ	Ministry of Climate and Environment
NFOŚiGW	National Fund for Environmental Protection and Water Management
Site	Białowieża Forest World Heritage Site, used interchangeably with "Property"
RES	Renewable Energy Sources
Plan	Białowieża Forest World Heritage Site Management Plan (Polish part)
PGL LP	State Forests National Forest Holding
PGW WP	Polish Waters State Water Holding
PKD	Polish Classification of Activities
PO	Conservation plan
PUL	Forest management plan
PZO	Plan of protective tasks
RDOŚ	Regional Directorate for Environmental Protection
RZGW	Regional Water Management Authority
EU	European Union
UNESCO	<i>United Nations Educational, Scientific and Cultural Organization</i>
OUV	<i>Outstanding Universal Value</i>
Operational Guidelines	<i>Operational Guidelines for the Implementation of the World Heritage Convention WHC.21/01 31 July 2021</i>

Abstract

The Białowieża Forest World Heritage Site Management Plan (Polish part) implements **obligations arising from the Białowieża Forest's inscription on the UNESCO World Heritage List**. The purpose of *the Plan* is to provide a protection framework for the unique forest ecosystem and to ensure sustainable management of the Site, in the part within Poland's borders. The study takes into account the current legal framework, including the provisions of the UNESCO Convention of 1972. It aims to protect biodiversity and ecological processes for future generations.

When working on the *Management Plan*, an approach based on the principles of adaptive management was adopted. Special attention is paid to the integration of scientific knowledge with the Site's conservation objectives. This approach is based on continuous monitoring and adaptation of the measures to changing conditions. Key elements include identification of threats, adjustment of conservation objectives, and implementation of monitoring. Stakeholder involvement is important for the acceptance of adopted measures, even if they involve restrictions or changes in the use of the land.

The work on the *Plan* was based on literature analysis, expert studies and workshops with participation of stakeholders such as local communities, social organizations and scientists. In the **participatory process**, main stakeholder groups were identified according to their impact and involvement, which enabled the development of common solutions. The *Plan* is a tool to support the effective management, protection and monitoring of the Site's condition, taking into account both nature conservation and local development.

Białowieża Forest, one of the last and best preserved forest complexes of primeval character in Europe, is distinguished by its unique conservation history and rich biodiversity. Already in the Middle Ages, it was protected as a royal hunting ground, which helped preserve its original character. In the 20th century, formal protection was established, and in 1921 a special unit named "Reserve" was created. In 1932 the "Reserve" was changed to the "National Park in Białowieża". In 1947 this entity was re-established as the Białowieża National Park and this name is used to this day. In 1979, a part of the Forest was placed on the UNESCO World Heritage List. The environment of the Forest is characterized by a temperate transitional climate, and its terrain is a mosaic of different forest types, such as oak-hornbeam forests, riparian forests, alder forests, pine and spruce forests, as well as communities characteristic of river valleys. The first scientific references to the Forest date back to the 18th and 19th centuries, when its flora and fauna were studied. In the 19th century, detailed studies of the flora began, and in the 20th century the focus was on the biology and ecology of the European bison, whose population was endangered. After World War II, the research was expanded to include bison restoration projects and fauna analyses in the context of climate change, highlighting the unique character of the Forest's ecosystem.

The Site is also a place where different cultures and traditions intertwine. The area, historically a Polish-Belarusian-Lithuanian borderland, is called a **cultural melting pot**. The foundation of its identity was the coexistence of different social, ethnic and religious groups. Presently, the area is part of the Podlaskie province, and its local community, which includes, among others, the municipalities of Białowieża, Hajnówka and Narewka, plays an important role in the management and protection of the Forest.

The Białowieża Forest is protected by the Białowieża National Park, nature reserves, Natura 2000 areas and a Biosphere Reserve. Thanks to six centuries of conservation history and due to ecological processes, which occur naturally in most of the area, a unique diversity of habitats and species has been preserved here. Despite the traces of human presence, **forest exploitation was limited here**, which allowed the original character of the ecosystem to be preserved. Numerous scientific studies confirm the uniqueness of this complex compared to other forests in Europe.

The Białowieża Forest, listed as a UNESCO World Heritage Site, is an example of **exceptional ecological processes** (Criterion IX) and habitats crucial for **biodiversity** conservation (Criterion X). It constitutes a unique ecosystem of natural lowland forests of the temperate climate zone, which have developed continuously since the last glaciation. Due to limited human impact over the centuries, especially in areas under strict protection, it has been possible to preserve undisturbed natural processes.

The Site is characterized by dynamic fluctuation and regeneration processes, supported by multi-layered forest stands and an age-diverse forest structure. Of key importance for the ecosystem are natural dependencies such as tree toppling, herbivore activity and the **presence of dead wood**, which provides, among others, habitat for invertebrates related to dead wood. The forest is a place of unique trophic relationships and a habitat for rare species, including woodpeckers and fungi, which makes it one of the most valuable forest areas in the northern hemisphere.

The protection of the European bison, Europe's largest land mammal, is one of the greatest successes of the Forest preservation. At present, its territory is home to one of the largest free herds of this species in the world. The Forest also provides suitable conditions for large carnivores such as wolves and lynxes, as well as unique communities of insects, fungi and plants.

The Białowieża Forest is characterized by a low degree of fragmentation and complex structures of forest ecosystems. It is a **harmonious mosaic of forest and non-forest habitats**, connected by a network of rivers, which support the migration of animals and plants. Telemetric studies have shown that large mammals such as bison, wolves and lynxes use the entire area of the Forest, ignoring administrative borders of Forest municipalities. However, it should be emphasized that since its construction, the barrier on the border between Poland and Belarus has been a partial obstacle to animal migration.

The most important features of the Forest integrity are the presence of natural forests, the age diversity of tree stands, the presence of very old trees, and the stability of the dead wood resources. Together, they form a unique ecosystem of exceptional value for nature conservation.

Threats to the Białowieża Forest are understood as factors which may have a negative impact on its natural resources and ecological processes. They can be natural or anthropogenic in nature and be present within the area or in its surroundings. A key challenge is to identify and analyze links between various threats, which often reinforce each other. The main sources of threats are climate change and human activity which leads to habitat fragmentation caused by construction of infrastructure and hydrological changes. Particularly important are the border barriers between Poland and Belarus, which affect animal migration, species distribution and the spread of invasive plants, and contribute to the isolation of populations of large mammals, including lynx. Those hindrances require integrated management which takes into account also institutional, financial,

political, legal and social barriers. Border barriers constitute both a physical and a political barrier, which affects the character of the Forest as a cross-border area. A set of measures has been developed to minimize both the threats and the barriers and to effectively protect the World Heritage Site.

The development of the *Plan* with **the long-term vision** as well as the identified objectives and real actions for which funding is provided should allow for effective management of the Site. A clear organizational structure of the management has been established, including the entity responsible for coordinating the implementation of the *Plan*, that is the Site Management Plenipotentiary. Legal tools and regulations are consistent, and all actors involved in the management **know and accept their roles**, which fosters concerted efforts to protect the Outstanding Universal Value (OUV) for future generations. The Site is properly protected, and the ecological processes in the forest habitats are undisturbed, with species populations being shaped by natural factors as well as limited human activity. The preservation state of the Property raises no concerns, and its scientific value is being maintained, making it possible to counter threats. The Białowieża Forest is recognized in Poland and throughout the world thanks to numerous studies and publications. Thanks to efficient management, the OUV is being preserved for future generations, and managers and stakeholders understand the principle of intergenerational justice, recognizing the importance of preservation of the Property for ecology, biodiversity and local identity. The present generation is deepening its knowledge and shaping attitudes thanks to this unique Site.

Due to its uniqueness, the Forest has been inscribed on the World Heritage List, and the aim of the *Management Plan* is to preserve the Białowieża Forest for future generations. *The Management Plan...* was developed for the period until 2050, with cost projections for its implementation limited to the period until 2035. Securing effective funding is of key importance for the implementation of measures to preserve the Outstanding Universal Value of the Białowieża Forest. Currently, the funds come mainly from the land managers - the Białowieża National Park, the State Forests National Forest Holding, and from national and EU funds at the disposal of the **Regional Directorate for Environmental Protection** in Białystok. The estimated cost of the measures by 2030 is about 61 million zlotys, and for the years 2031-2035 about 46 million zlotys, most of which are assigned for biodiversity protection. Expenditures are also planned for the activities of the Site Plenipotentiary and the investment in the World Heritage Site Center. It should be emphasized that those costs are indicative and must be specified at the stage of designing individual undertakings, due to the long time horizon and changing funding sources.

Adopting **a vision for 2050**, it is assumed that the area will be a place where ecological processes take place naturally, and natural habitats providing biodiversity are protected. The integrity of the Site is to be preserved thanks to the presence of untransformed, extensive forest ecosystems and the maintenance of undisturbed ecological processes. The Forest is also going to be a place of importance to humanity, which inspires actions for sustainable development of local communities and environmental education. To implement the vision of the Białowieża Forest by 2050, **eight objectives have been adopted**. Three of which refer to the criteria for the Forest's inscription on the World Heritage List and the integrity conditions:

1. Preservation of undisturbed ecological processes;
2. Protection of biodiversity at all levels and its essential habitats;

3. Preservation of the integrity of the Site as a whole.

The remaining objectives refer to the sustainable use of the Site:

4. Promotion of and support for the cooperation between of international, national and local actors;
5. Creation of conditions for sustainable development of the Białowieża Forest municipalities;
6. Strengthening of the identity and pride of local communities on the basis of knowledge of the natural, cultural and historical values of the Białowieża Forest;
7. Provision of environmental and cultural education and promotion of the World Heritage Site;
8. Use of the outstanding value of the World Heritage Site to promote the Białowieża Forest region.

Those objectives have been identified based on current knowledge of Outstanding Universal Value (OUV) and in consultation with stakeholders, with the intention of responding to threats which adversely affect this value and to barriers to effective management of the Site. For each of the objectives, measures for its achievement are defined.

Directions and measures to be implemented were developed in a participatory manner, with active involvement of various groups of stakeholders. Those directions are closely linked to the determined measures, which promotes the effective implementation of the aforementioned objectives. Their implementation will allow to reduce the identified risks and barriers to the integrity of the Site and to achieve the planned results.

Activities are coordinated by **the Site Management Plenipotentiary**, who cooperates with Site Managers and other key individuals and institutions. The Steering Committee, appointed by the Minister of Climate and Environment, has an advisory role, controlling the implementation of the *Plan* and making decisions in emergency situations. The Plenipotentiary coordinates the implementation of *the Plan*, monitors cooperation between managers and environmental organizations, and prepares reports. The Plenipotentiary's activities also include working with business and raising public awareness of the Białowieża Forest.

The Scientific and Social Council of the Białowieża Forest Site is a consultative and advisory body to the Site Management Plenipotentiary, with up to 21 members, including representatives of local governments, NGOs and scientific institutions. The Council, which is appointed by the Minister competent for the environment for a five-year term, works with other scientific bodies to support the protection of Outstanding Universal Value and the implementation of the *Management Plan*. The legal framework for the Białowieża Forest area is defined by Polish law and international conventions, which impose obligations on Site managers and local governments within the scope of conservation and sustainable management. Management objectives and activities must be consistent with the provisions of the *Management Plan* and support the protection of the Outstanding Universal Value of the Białowieża Forest.

Conservation plans, in accordance with the provisions of the Nature Conservation Act, are developed for national parks, reserves, landscape parks and Natura 2000 areas, and their content must be compliant with the requirements of that Act and the objectives of the *Management Plan*. The objectives of protection measures provided for in the plans must enable the preservation of the

globally unique forest ecosystem and biodiversity. The plans should take into account threats to natural habitats and methods to minimize them, as well as protection zones in accordance with the adopted zoning. Conservation plans must include elements of monitoring and adaptive management, as well as results of a landscape audit. Within the area of the Białowieża Forest, conservation plans for the Białowieża National Park and some of the reserves are in effect, and in the absence of such plans, conservation tasks are determined by the Regional Directorate for Environmental Protection. Currently, a new conservation plan is also being developed for the Natura 2000 area of the Białowieża Forest with exclusion of the area of the Białowieża National Park.

In order to streamline the management and outline the rules, zoning of the Site has been introduced. **The zoning of the Site** is primarily aimed at protecting its Outstanding Universal Value (OUV) and indicates measures which will allow to maintain those values now and in the future. The zoning was approved when the Site was inscribed on the World Heritage List. It should also be emphasized that the rules applicable for each zone were outlined in the nomination proposal. The zoning of the Site is a key element of nature conservation and simultaneously ensures accessibility of natural resources for local communities.

A summary of expert recommendations, included in the *Management Plan*, is a synthesis of guidelines and recommendations based on expert knowledge and results of research on the protection of the Site's OUV. The recommendations are divided into two parts: concerning preservation of the Outstanding Universal Value and the sustainable use of the Site.

As a **UNESCO World Heritage Site**, the Białowieża Forest requires a sustainable management approach, which takes into account both the protection of its **Outstanding Universal Value** and dynamically changing challenges such as **climate change, tourism pressure and habitat fragmentation**. A key tool in this regard is **adaptive management**, which allows flexible planning of measures, their regular monitoring and making adjustments in response to new information and circumstances. The proposed management measures, such as **the removal of redundant infrastructure** (e.g. inter-forest fencing) and **the renaturalization of aquatic ecosystems**, are consistent with this approach. Systematic monitoring and analysis of the effectiveness of the adopted measures enable the gradual improvement of the Forest's conservation strategy, which increases the efficiency of operations and cooperation between institutions responsible for protecting this unique place.

The measures should be introduced by competent institutions and organizations, in cooperation with the local community and scientific experts. Also, a multiannual monitoring program must to be implemented to comprehensively evaluate the effectiveness of the Site's management. Emphasized is the need to develop and implement a monitoring program for the Białowieża Forest Site which takes into account all the factors indicated in its description. A key element in achieving the objectives of this measure is the cooperation of all entities responsible for its implementation. In addition, important assumptions for effective monitoring are included in other measures provided for in the *Plan*, and recommendations for the protection of the OUV can be found in the expert report on the impact of the border barrier on the Site.

The **evaluation system** of the *Plan* is an important element of adaptive management to oversee the effectiveness of implemented measures. Evaluation indicators have been assigned to management objectives, which is consistent with the management structure of the *Plan* implementation. A key

role in coordination of the evaluation process is played by **the Management Plenipotentiary for the Białowieża Forest Site**, whose tasks include data collection, coordination of cooperation between entities and preparation of evaluation reports.

The first year after the adoption of the *Plan* and the appointment of the Management **Plenipotentiary** for the Białowieża Forest Site will be devoted to development of an **organizational structure** and the rules for collecting information and data. Many of the measures provided for in the *Plan* will be implemented in cooperation with various groups of stakeholders, and the Plenipotentiary will coordinate the collection of data from various sources. The planned **Białowieża Forest World Heritage Site Centre** is to serve as an organizational and technical facility for monitoring and evaluation purposes.

The first report on the implementation of the *Plan* should be prepared **three years** after its adoption. A key element of the report will be to indicate which one-time measures have been implemented. In subsequent years, evaluation reports will be prepared every **three years** and presented to the Scientific and Social Council of the Site. After obtaining a positive opinion, the reports will be disseminated, which will allow discussion with various groups of stakeholder about possible changes to the *Plan*.

After **ten years** of implementation of the *Management Plan*, an *on-going* evaluation is planned to answer key questions about the adequacy of objectives and measures, to evaluate the effectiveness of the implementation, the consistency of the *Plan* with other documents, and to identify new threats. The evaluation should be conducted with the participation of independent experts and the Site Management Plenipotentiary.

1. Introduction

1.1 Basis for the development of the Plan and its purpose

The Białowieża Forest World Heritage Site Management Plan (Polish part), hereinafter referred to as the *Plan*, fulfils the obligations of the state arising from the inscription of the Białowieża Forest on the World Heritage List, which is based on the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted in Paris on November 16, 1972 and ratified by Poland on June 29, 1976. The document sets out a framework for all activities in the area of the Białowieża Forest until 2050.

In 1979, the Białowieża National Park, which covers a part of the Białowieża Forest, was inscribed on the UNESCO World Heritage List as one of the first natural sites in the world. In 1992, the entry was expanded to include the Belarusian forest complex and was granted the status of a transboundary Natural Site. In 2014, by the decision of the World Heritage Committee, the Site was again enlarged and the entry criteria were changed to IX and X, emphasizing the unique role of the Białowieża Forest in the preservation of natural ecological and biological processes important for the evolution of ecosystems and the protection of biodiversity, including habitats of endangered species of exceptional scientific and natural value¹. The Site was then given the name "Białowieża Forest". In this *Plan*, the terms Site and Property are used interchangeably.

In ratifying the Convention, Poland pledged to "ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage" (Article 4 of the Convention). The implementation of those obligations is specified in detail in the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO, 2025). According to those guidelines, the protection and management of world heritage sites must ensure that their Outstanding Universal Value (OUV), including the integrity of the site, is maintained at a level no worse than at the time of the inscription or foster its further enhancement.

Declaration of the Outstanding Universal Value of the Białowieża Forest (consolidated text 38 COM 8B.12, Doha - Annex 1), adopted at the time of the Site's inscription, is the key reference document for its protection and management. In light of *the Operational Guidelines...* the site must be granted long-term protection and managed effectively, which requires the development of a comprehensive management plan. Such a plan should clearly define how to ensure the protection of the OUV of the site and how to involve the society in the implementation of those measures.

Taking into account the aforementioned guidelines and *the Declaration of the Outstanding Universal Value*, the aim of the *Plan* is to ensure effective protection and management of the site, enabling the preservation for present and future generations of a globally unique forest ecosystem, intact ecological processes and the resulting biodiversity. The document covers the area of the Białowieża Forest Site, along with the buffer zone and the broader surroundings relevant to the integrity of the Property. Territorially, the *Plan* applies to municipalities in the Białowieża Forest region, including

¹ Decision of the World Heritage Committee (Doha, 2014) 38 COM 8B.12 to extend the Site, change the criteria for the inscription of Belovezhskaya Pushcha / Białowieża Forest on the World Heritage List, and change its name to Białowieża Forest.

those in Hajnówka district and the municipality of Michałowo, a small part of which covers the buffer zone. Local communities of those municipalities participate in the management of the Site. The *Plan* is being implemented, among others, through the documents referred to in the Nature Conservation Act, developed and adopted for the conservation forms found in the area of the Białowieża Forest - Białowieża National Park, Natura 2000 area PLC200004 Białowieża Forest, nature reserves (described in more detail in Chapter 6.2). The *Plan* is also being implemented through forest management plans, developed and adopted under the Forest Act, in the Białowieża, Browsk and Hajnówka Forest Districts, and to some extent by the Bielsk Forest District, within the borders of which a part of the Site's buffer zone is located (described in more detail in Chapter 6.2). In addition, in the buffer zone of the Property, the *Plan* is being implemented through strategies, plans and programs adopted by the local government of Podlaskie Province, Hajnówka District and the municipalities of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Czyże, Kleszczele and Michałowo, in accordance with the contents of the Spatial Planning and Land Development Act (described in more detail in Chapter 6.2).

It should be noted that the Białowieża Forest, as a Transboundary Site, requires an integrated management plan, covering both the Polish and the Belarusian part. The requirement to develop an integrated plan results from regulations implementing the Convention, as well as from the decision of the World Heritage Committee. Consistent management of the entire Site is key to addressing threats, including the challenges posed by the state border (IUCN World Heritage Outlook 2020). Despite the previous effective transboundary cooperation, due to the current geopolitical conditions, this *Plan* has been developed exclusively for the Polish part of the Site, in accordance with the recommendations of UNESCO and IUCN mission of 2018 (WHC/IUCN 2018) and of 2024 (WHC/IUCN 2024). In the Polish part of the Site, the *Plan* has a coordinating function for the existing management tools. The Polish state is obliged to ensure the implementation of those tools for the effective protection of the OUV.

1.2 Methodology

The *Plan* has been developed using the latest scientific research, ensuring community participation at every stage, and in accordance with the management principles set forth in the *UNESCO Operational Guidelines* (2021). The guidelines define the strategic objectives of the World Heritage, referred to as the "5 Cs," including:

- strengthening the Credibility of the World Heritage List (*Credibility*),
- ensuring the effective Conservation of World Heritage Properties (*Conservation*),
- effective Capacity building in conservation of World Heritage (*Capacity building*),
- increasing public awareness, involvement and support for World Heritage through Communication (*Communication*),
- enhancing the role of Communities in the implementation of the World Heritage Convention (*Communities*).

In addition, the *Guidelines* identify elements of an effective management system, including the need for a shared understanding of the site's value, respect for diversity and human rights, cyclical planning, risk assessment and change monitoring. Important are also collaboration mechanisms, access to resources, capacity building and transparency of management.

The management plan is based on the principles of adaptive management, according to which all measures should be introduced based on the current state of knowledge, then monitored for their impact on the Site, and finally adapted based on the results of the monitoring and newly acquired knowledge (Fig. 1). All introduced measures must contribute to mitigation of the existing and emerging consequences of climate change and anthropogenic pressures, and support more effective protection of the outstanding universal value (OUV) of the Site.

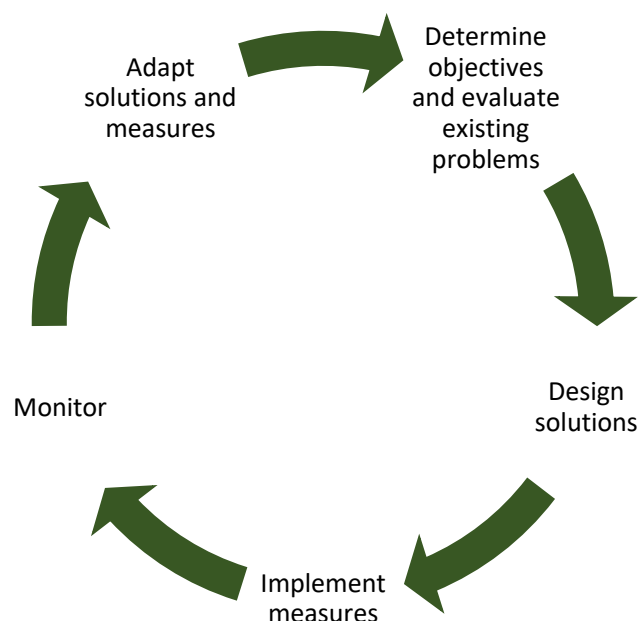


Fig. 1. Schematic of the adaptive management approach developed based on EU Guidelines on climate change and Natura 2000 (European Commission, 2013)

The document defines management objectives, which are assigned specific implementation measures. Emphasized is also the need for systematic evaluation of the plan's assumptions and their ongoing adaptation to changing conditions, in order to maximize the results in protecting the OUV of the Site. In addition, the need to develop an individual, multi-year program for the Site monitoring is indicated, as recommended in the Mission 2024 report.

Guided by the strategic goals and elements of effective management of the World Heritage, the following rules for the development of the *Plan* have been adopted:

- meeting the requirements of the *Convention concerning the Protection of the World Cultural and Natural Heritage*, including the decisions of the World Heritage Committee concerning the Białowieża Forest,
- striving for a common understanding among stakeholders as to why the value of the Białowieża Forest Site is unique, requires protection and consistent management, as well as fostering a sense of responsibility, shared decision-making and allowing stakeholders to actively participate in the management of the area,
- ensuring consistency and continuity of the Site's conservation by defining a vision of the Białowieża Forest with an outlook to 2050 as well as the measures to be introduced within the area of the Site,

- objectivity and reliability of information which forms the basis for the development of the *Plan* ensured through the use of professional knowledge, the source of which is modern science, but also knowledge provided by stakeholders,
- providing an action plan for the Białowieża Forest Site and a management system comprehensible and acceptable for stakeholders (for the largest possible number of stakeholders).

This *Plan* is the result of a multi-stage process (Fig. 2).² Each stage was completed through methods selected according to the objectives and expected results.

Expert work included analyses and workshops of the IOŚ-PIB Project Team as well as the preparation of specialized expert opinions on the conservation and use of the Białowieża Forest. The analyses were based on a review of literature and source materials, a list of which is provided in the *Plan*. The expert opinions provide detailed recommendations and guidelines for the effective protection of the OUV of the Site, making them a key tool in the management process, especially in the monitoring of the condition of the Site. A full list of the expert opinions and the composition of the Project Team can be found in Annex 2.

Furthermore, as part of the work on the *Plan*, workshops took place during which stakeholders jointly worked out the individual elements of the *Plan*. In total, over 40 meetings were held, a list of which is provided in Annex 3. In addition, two surveys were conducted. The first one, directed at scientists, aimed to assess threats (in terms of their impact on the OUV and possibilities of counteracting them) as well as barriers (including their importance for the Site management and methods to overcome them). The second survey was directed at stakeholders participating in the workshops, including representatives of local communities, social organizations and the scientific community. Its purpose was to determine the level of acceptance for the measures proposed in the *Plan*.

² The process was planned and presented in the document *Opracowanie Planu Zarządzania dla Obiektu Światowego Dziedzictwa Białowieża Forest. Metodyka [Development of a Management Plan for the Białowieża Forest World Heritage Site. Methodology]*, available in IOŚ-PIB resources and on the project's website at <https://ios.edu.pl/bialowieza-forest/>.

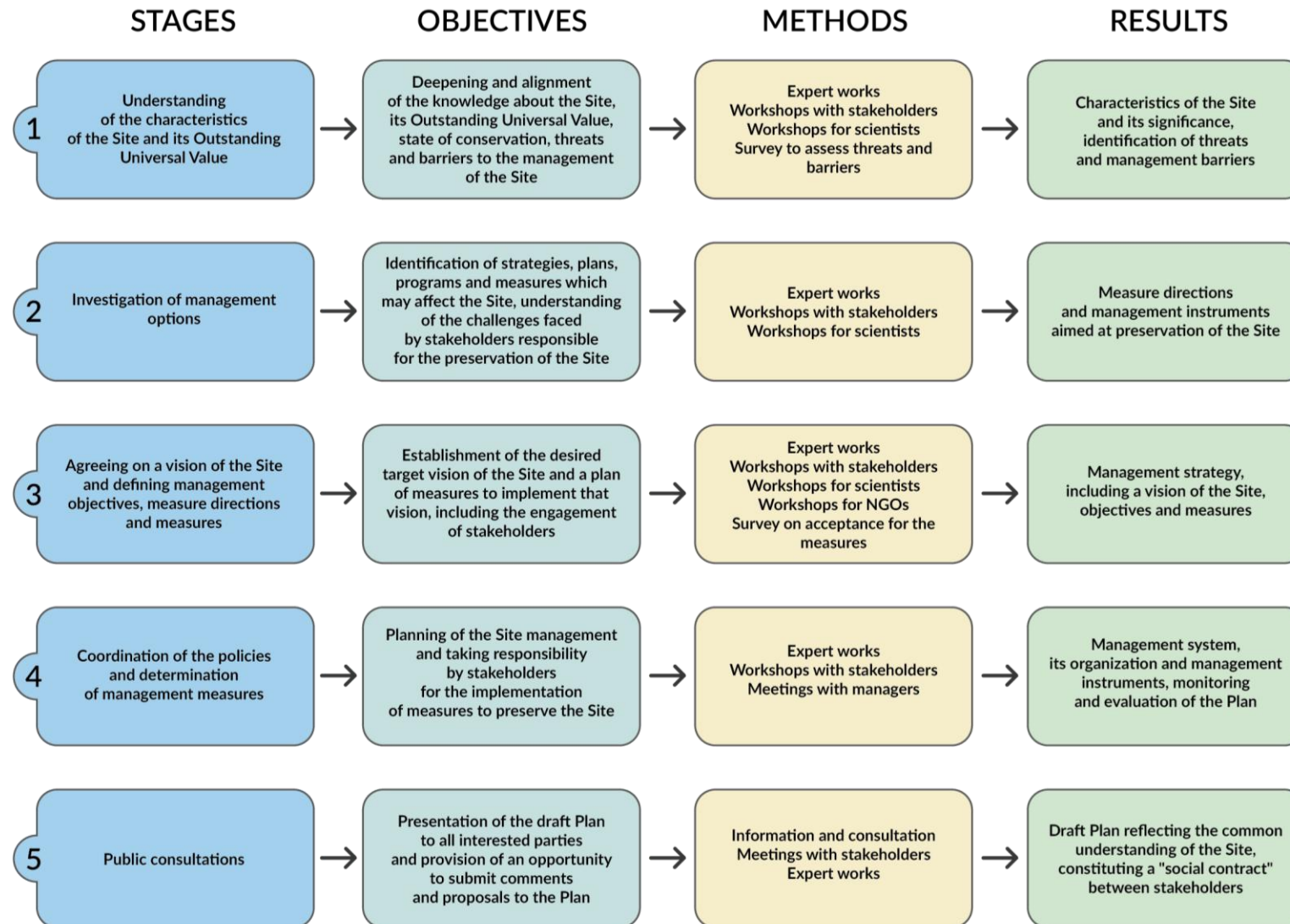


Fig. 2. The process of the Plan development: stages, objectives, methods, results

1.3 Stakeholders

The *Plan* for the management of the World Heritage Site is intended to foster effective communication between management entities in the Białowieża Forest area, as well as supervision and evaluation of the effectiveness of its management. An important part of the development of the *Plan* was collaboration, meetings with various groups of stakeholders and with the Site Managers. Involvement of stakeholders is a key component of an adaptive management approach, as it allows to identify and discuss the consequences of different management options - both for species and ecosystems, and for the related ecosystem services. Early, transparent and active involvement of stakeholders in the decision-making process supports acceptance for the measures, even if they involve the introduction of restrictions, such as changes in the active management, hunting or the use of non-forest land. Participation of stakeholders at an early stage of the adaptive management process can significantly increase the effectiveness of the implementation phase, while participatory aspects are often treated as marginal or only as an addition to the introduced measures. Considering the benefits of stakeholder participation in the development of the *Plan*, various forms and tools of participation were used to prepare it. That approach was aimed at building and deepening of knowledge about the management of the World Heritage Site, as well as allowing a detailed explanation of the decisions adopted, including the reasons why not all ideas and demands could be implemented, due to the specifics of the protected Site. The inclusion of stakeholders in the process of the *Plan* preparation also allowed for the joint identification of potential benefits resulting from the operation of the Site for the local socio-economic development.

According to the definition, a stakeholder is any person or organization having impact on the *Plan* or able to impact it as well as contribute to its success or failure. Stakeholders are not a homogeneous group, as they have different institutional "mandate" and may pursue different goals. Therefore, it was crucial to identify (map) them and determine the strength of their influence on the entire process of the *Plan* development, considering that the mechanism of stakeholder involvement was planned at each stage of the *Plan* preparation. In the course of the works, four main groups of stakeholders were identified (table 1):

- key stakeholders, characterized by high influence and commitment. In line with good participation practices, that group included social partners - also local ones;
- influential stakeholders, having a potentially high influence (both positive and negative). Also their role in the shaping of public opinion, both locally and supra-locally, was taken into account;
- potential allies, having little influence but a lot of commitment and interest;
- dormant (potentially indifferent) stakeholders, with little influence and low commitment.

Table 1. Map of the *Plan's* stakeholders

Key stakeholders	Influential stakeholders
<ul style="list-style-type: none"> - Białowieża National Park - PGL LP, including the Regional Directorate of State Forests in Białystok (and the Białowieża, Browsk and Hajnówka Forest Districts) - Polish National Commission for UNESCO - Ministry competent for the environment 	<ul style="list-style-type: none"> - Podlasie Parliamentary Group - Some social organizations, especially nationwide - Białystok University of Technology - Forestry Technical School in Białowieża - Bureau for Forest Management and Geodesy, Branch in Białystok

<ul style="list-style-type: none"> - National Institute of Cultural Heritage - Regional Directorate for Environmental Protection in Białystok - Local governments of the Białowieża Forest municipalities (the Municipality Council and the - Mayor/Municipality Head) - Local government of Podlaskie Province - Council and Management Board of Hajnówka district <p>Social partners:</p> <ul style="list-style-type: none"> - Supra-local organizations - Most active local organizations - Local leaders (individuals - some local guides, village administrators, heads of KGW [Country Housewives' Clubs], etc.) 	<ul style="list-style-type: none"> - Local entrepreneurs related to the forestry sector: forest service companies, sawmills, woodworking shops - Entrepreneurs from the hospitality and catering sector - Celebrities/famous people with ties to the Forest - Local and regional media as well as nationwide media - Border Guard posts: Białowieża, Dubicze Cerkiewne, Narewka, Czeremcha, Michałowo - Military unit in Nieznany Bór
Potential allies	Dormant (potentially indifferent)
<ul style="list-style-type: none"> - State Council for Nature Conservation - Scientific entities, among others: Mammal Research Institute at the Polish Academy of Sciences, Białowieża Geobotanical Station of the University of Warsaw, and Department of Natural Forests of the Forest Research Institute - Youth and senior councils of municipalities (for those municipalities where they operate) - Provincial Office for Monument Protection in Białystok - Environmental organizations on national, regional and local levels - Some agritourism farms, small guesthouses offering environmentally friendly tourism services, etc. 	<ul style="list-style-type: none"> - General local community - Country Housewives' Clubs - Local social organizations - Some agritourism farms - Volunteer Fire Department Białowieża - Podlaskie Agricultural Advisory Centre, branch in Hajnówka - Podlaskie Agriculture Chamber, branch in Hajnówka - Agriculture Restructuration and Modernisation Agency, branch in Hajnówka - District Police Headquarters in Hajnówka - District Roads Administration in Hajnówka - Local Action Group "Puszcza Białowieska" - Regional Water Management Authority in Lublin; Regional Water Management Authority in Białystok - Churches and religious associations - Educational institutions (in general, except the most active ones) - individual foreign and domestic tourists - Podlaskie Business Club - Local business associations (e.g., the Association of Entrepreneurs NASZA BIAŁOWIEŻA; Association of Merchants and Entrepreneurs of Hajnówka District) - Union of Municipalities of the Białowieża Forest Region

In consultation with stakeholders, the following rules of participation and consultation were adopted:

- universality - the process of participation and consultation is open to all and everyone can express their views;
- transparency - everyone has access to information about the purpose, rules and results of the consultation;
- coordination - everyone may find out who is conducting the consultation and for what purpose;

- communication - there is an exchange of information between the host of the participation and consultation process and its participants.

It should be noted that the *Management Plan* is an open document, serving as a tool for the management of the Site. Its implementation, in addition to the documents indicated in Chapter 6.2, is carried out at the local level by the Site Managers, i.e. the Director of the Białowieża National Park and the managers of Hajnówka, Białowieża and Browsk Forest Districts, as well as with the active involvement of the community, especially residents of the Białowieża Forest municipalities. In addition, the Plenipotentiary, in carrying out their tasks, cooperates with the Site Managers, the Steering Committee and the Scientific and Social Council (described in more detail in Chapter 6). The aim of the *Plan* is to reduce and even eliminate disputes, through a common understanding of the value of the World Heritage Site, which will allow the local community to actively participate, within the scope of its competence, in the conservation and management of the Białowieża Forest Property.

1.4 Plan structure

The adopted structure of the Białowieża Forest Site *Management Plan* aims to facilitate the practical use of the information contained in it and the implementation of the planned measures. The document focuses on key elements, and if users need to extend their knowledge, they can consult the annexes referenced in the text.

The document consists of 11 chapters with annexes, which form an integral part hereof and expand the contents of each chapter. As part of the work on the *Plan*, a number of expert opinions were obtained, which are available in IOŚ-PIB resources, including on the project website. A list of those expert opinions can be found in Annex 2. The development of those materials has allowed for a better understanding of the specifics of the Site and the preparation of detailed recommendations aimed at more efficient protection of its key elements.

Structure of the *Management Plan*

- **Chapter 1:** It presents the formal basis for the development of the *Plan* and the methodology used, including the participatory approach adopted. A detailed description of the planning process and the public dialogue can be found in the document *Opracowanie Planu Zarządzania dla Obiektu Światowego Dziedzictwa Białowieża Forest. Metodyka [Development of a Management Plan for the Białowieża Forest World Heritage Site. Methodology]*, available in IOŚ-PIB resources.
- **Chapter 2:** It presents the characteristics of the Site, including its unique features, previous forms of nature conservation, and a description of the Outstanding Universal Value of the Property with a detailed presentation of the criteria for inscription on the UNESCO World Heritage List.
- **Chapter 3:** The document contains a detailed analysis of key threats and barriers to the functioning of the Site. In response to the identified problems, appropriate measures have been developed, as presented in Chapter 5.1. In order to more easily link the measures with the corresponding threats and barriers, matrices have been developed and are included in Annexes 4 and 5 (for threats and barriers, respectively). In addition, the Mammal Research Institute at the Polish Academy of Sciences (IBS PAN) conducted an assessment of the impact

of the border barrier on the Site. Detailed results of that analysis are presented in the document *Oddziaływanie zapory granicznej na granicy polsko-białoruskiej na Obiekt Światowego Dziedzictwa Białowieża Forest – Ssaki i rośliny inwazyjne [Impact of the border barrier on the Polish-Belarusian border on the Białowieża Forest World Heritage Site - Mammals and invasive plants]*, available on the project website. The main recommendations presented in that document were used to formulate the recommendations in Chapter 5.2.

- **Chapter 4:** It describes eight strategic objectives supporting the general Vision of the Site and the results to be achieved through appropriate management by 2050. The vision is to preserve the Site as an integral, unique and natural ecosystem, protected and recognized throughout the world. Management objectives include, among others, protection of biodiversity, preservation of the integrity of the Site, and promotion of sustainable development of the region. The results include effective management of the Site, ensuring its protection, education and recognition, as well as integration of the local community into environmental processes.
- **Chapter 5:** It presents a catalog of measures developed to minimize the negative impact of the identified threats and barriers, while fulfilling the Vision of the Site. Again, in order to more easily link the measures with the corresponding threats and barriers, it is recommended to use the developed matrices, included in Annexes 4 and 5 (for threats and barriers, respectively). In addition, a number of expert recommendations are presented as a synthesis of the guidelines and recommendations. More expert recommendations for individual components of the Property can be found in expert opinions posted on the project website.
- **Chapter 6:** It presents in detail the measures coordination system, the legal framework for the implementation of provisions of the *Plan*, border security issues, as well as the zoning system adopted, which, at the same time, defines the scope of permitted activities in individual areas of the Site. A catalog of activities permitted within individual zones is provided in Annex 6. Defined are also responsibilities of the person coordinating the implementation of the *Management Plan*, i.e. the Management Plenipotentiary for the Białowieża Forest Site. In addition, recommendations have been issued to reduce the negative impact of border guard operations on the Outstanding Universal Value (OUV) of the Site. Indicated are also elements of the *Plan* which should be taken into account in the development of other documents through which the *Plan* is being implemented.
- **Chapter 7:** It presents assumptions for monitoring conducted at the Site. The identified indicators will allow to verify the effectiveness of the implementation of the *Plan's* objectives and the whole implementation process.
- **Chapter 8:** It represents a collection of literature used in the development of the *Plan*.
- **Chapter 9:** It provides a list of tables and figures.
- **Chapter 10:** It provides a list of annexes.
- **Chapter 11:** It contains a glossary of terms used in the *Plan*.

2. The Site and its significance

2.1 Characteristics of the Białowieża Forest Site

2.1.1 Location

The Białowieża Forest World Heritage Site is a transboundary area, straddling the border between Poland and Belarus (Fig. 3).

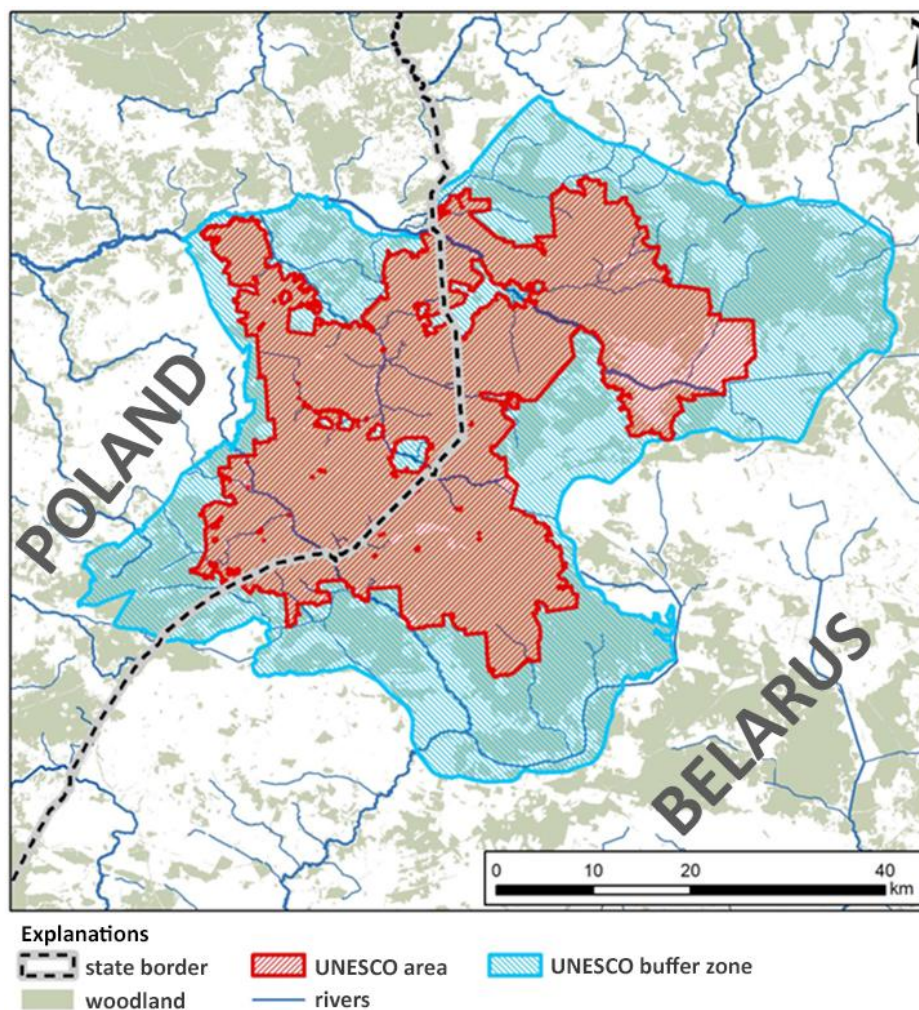


Fig. 3. Location of the Białowieża Forest transboundary site (own compilation based on data from GUGiK, BPN, OpenStreetMap)

On the Polish side, the Site comprises the Białowieża National Park, the Białowieża Forest District and part of the area of the Browsk and Hajnówka Forest Districts, while on the Belarusian side it covers the area of the "Belovezhskaya Pushcha" National Park. The area of the Site is 141 885 hectares, of which 59 576 hectares are in Poland and 82 309 hectares in Belarus. The buffer zone established around the Site covers 166 708 hectares, of which 35 835 hectares are in Poland and 130 873 hectares in Belarus (Belovezhskaya Pushcha / Białowieża Forest World Heritage Site...2012).

The Polish part of the Białowieża Forest Site covers the eastern border areas of Podlaskie Province. In administrative terms, the Site is located in the Hajnówka district, covering parts of the municipalities of Białowieża, Dubicze Cerkiewne, Hajnówka, Narew and Narewka. The buffer zone established around the Site includes parts of the abovementioned municipalities, as well as the municipalities of Czeremcha, Kleszczele, the town of Hajnówka in the Hajnówka district and the municipality of Michałowo in the Białostocki district (a small section in the Narew river valley). The buffer zone of the Site includes State Treasury land as well as private land, comprising primarily agricultural land and private forests.

2.1.2 Natural environment

Climate and climate change

The Białowieża Forest Site is located in a transitional temperate climate zone. According to the climatic regionalization of Poland, the Białowieża Forest lies in the Masuria-Podlachia climatic region (Woś 1997). The region is characterized by the highest number of days with very cold weather, with the average daily air temperature below -15°C , as well as the highest frequency of days with frosty, moderately cold weather. Within the region of the Site, an increase in the annual average multi-year air temperature to $8,1^{\circ}\text{C}$ has been observed, compared to $6,8^{\circ}\text{C}$ in 1950-2003. The average number of growing days³ in the last decade (2011-2020) was 228 days per year (Klimada2.0). The average length of the forest growing season⁴ in the period 1948-2018 was 149 days (DGLP, 2019). Over the past decade, an increase in the average annual precipitation has been observed. There has been an increase in the number of rainless days primarily during the growing season. Snow cover in the multi-year period remains for an average of 92 days per year, with a significant annual variability. The average annual solar radiation in the last decade (2011-2020) was 1090 kWh/m^2 . Predominant winds in the area in question are from west winds. A relatively large share of wind from the eastern sector can also be observed. By 2050, the average air temperature is projected to increase by 8.1% and the number of hot days by as much as 21.3% (Klimada 2.0).

Terrain, geological structure and soils

The Białowieża Forest Site is located in the eastern border part of the Bielska Plain physico-geographical mesoregion, between the Upper Narew river valley in the north and the Nurc river valley in the south (Richling et al. 2021). The Bielska Plain is a post-glacial upland [wysoczyzna] - typical for the Podlasie Lowland - made of glacial deposits of the Central Polish glaciations with moraine and kame hills, transformed periglacially. It is divided by river valleys of Narewka and Leśna and their tributaries. To the north, it reaches the Narew river valley. Between the hills there are depressions of land in the form of kettle basins and blowouts.

The soils found within the area of the Białowieża Forest Site are strongly related to the geological structure of the ground. The area of the undulating moraine plain is dominated by lessive soils and brown-earth soils, especially luvisols and brown soils. Less common are gley soils - precipitous-gley soils and rusty soils classified as brown earth soils. The latter dominate among soils developed from sand and gravel deposits of moraine and kame hills (Kabala et al. 2021). From those sediments,

³ Number of days with the average annual temperature exceeding 5°C .

⁴ Period of the year with sustained average daily temperature of 10°C and above (Dragańska et al. 2017).

podzolic soils have also developed. In turn, in silty sediments of the kame hills, lessive soils have developed. River valleys are dominated by organic soils (peat, limnic and muck soils), while gley soils (top-gley soils), podzolic soils and black soils are less common. Patches of aeolian sands and dunes present within the moraine upland form the subsurface of nutrient-poor podzolic soils.

Hydrological conditions

The Białowieża Forest Site is located in the divide zone between the Narew and Bug river drainage basins. Its Belarusian part, on the other hand, is located in the vicinity of the divide separating the Baltic Sea and Black Sea drainage basins. Such a location has a direct impact on the hydrology of the area – it is a recharge area for surface water and groundwater, from which it drains further to lower-lying areas.

Among the most important watercourses flowing through the area are the Leśna River with its main tributaries Chwiszcza, Perebel, and the Narewka River with its main tributaries Hwoźna, Łutownia, Braszcza, Jabłoniówka⁵.

Apart from watercourses, an important hydrographic element of the Site are wetlands. They account for about 35% of the area of the Białowieża Forest. Wetlands are concentrated in particular along the Leśna, Hwoźna and partially Narewka rivers (Kolendo et al. 2021). Such elements allow for natural treatment of surface water. They also constitute potentially important water retention areas.

The process of diminishing water resources, observed over most of the country, also applies to the Site (Grygoruk et al. 2021). In recent decades (2000-2019), in the Narewka River in the Białowieża profile there was a statistically insignificant decreasing trend of average annual water levels and maximum annual levels. The opposite trend (also statistically insignificant) was observed for annual minimum levels. In the Narewka River in the Narewka profile, however, decreasing trends of the lowest and highest annual water levels and an increasing trend of average water levels were observed. Flows of the Narewka River, according to studies, did not change significantly (Grygoruk and Osuch 2022). In the Białowieża profile, a slightly increasing trend of medium flows and decreasing trends of low and high flows were observed. The decrease in the lowest annual flows is a very disadvantageous phenomenon. In all likelihood, it can be concluded that it is due, among other things, to reduced underground recharge of watercourses, and indirectly to prolonged periods of meteorological drought (Grygoruk 2022). The observed decline is also influenced by the process of long-term draining of the landscape of the Narewka river valley as a result of the former river engineering, as well as regularly repeated maintenance works (particularly in the section below the town of Narewka).

Periodic flow interruptions are already being recorded in some rivers of the Białowieża Forest. This applies in particular to rivers such as Braszcza, Łutownia, or Hwoźna. Periodic flow interruptions in the Narewka River, especially in its upper and middle reaches, are also considered likely (Grygoruk 2022). The declining low flows of the Narewka river may be related to the intensive re-hydration

⁵ The river network of the Białowieża Forest area is most likely not mapped accurately enough. This is evidenced by the significantly lower density of watercourses shown within the Site in the Hydrographic Division Map of Poland at a scale of 1:10,000 as compared to the surrounding areas. According to the results of analyses by Kolendo et al. (2021), the average density rate of the river network in the area in question is 3.44 km/km².

works conducted in Dzikoje and Dziki Nikar peatlands in the Belarusian part of the Site - the spring area of the Narewka river (Grygoruk and Osuch 2022). In the long term, that process may prove beneficial for the Narewka River drainage basin, as those peatlands may in the future supply water to the Narewka River during low water periods.

A lowering of the groundwater table has been observed within the area of the Site. Thus, the possibility of surface water recharge during periods of meteorological drought becomes reduced. Interferences in the hydrological system of the Białowieża Forest over the past two centuries have resulted in a lowering of the groundwater table by about 0.4 m (Pierzgalski et al. 2002). In the late 20th century, a series of renaturalization measures were introduced to slow surface and underground runoff and to protect wetland habitats. The effects of those measures will be seen in a few years.

A new element which may affect the water resources of the Białowieża Forest Site is the barrier on the state border, built in 2022. In some cases, it may have a significant impact on reduction of water inflows (e.g., the Wysokie Bagno reserve fed from the Belarusian area; Grygoruk 2022)⁶. A full assessment of the impact of that facility on hydrological conditions will be possible in a few years, based on observational data collected during that period.

Natural habitats, flora, fauna and fungi

The Białowieża Forest is one of the most valuable forest complexes in Europe, preserving the group structure and dynamics typical of natural forests of the temperate zone. Most of the Forest area preserved to this day has been covered with forest continuously since the last glaciation, with relatively low and spatially limited anthropopression, although industrial forest management introduced in the early 20th century has noticeably altered some of the tree stands. Nevertheless, the continuity of the forest ecosystems of the Forest is still largely shaped by the natural processes of forest regeneration, including disruptions associated with the occurrence of gaps, windthrows, windfalls, interspecies competition, herbivore pressure, as well as cyclic, large-scale gradations of insects (European spruce bark beetle, winter moth). Characteristic is a very large amount of dead wood, both standing and lying, as well as a high proportion of age-diverse tree stands with a multiple strata. Veteran trees are abundant, as well as tree stands with a significant share of more than 100-year-old trees (Jaroszewicz et al., 2019).

The part of the Forest located in Poland is characterized by the presence of a mosaic of extensive patches of natural habitats within the meaning of the Habitats Directive 92/43/EEC, with a high degree of naturalness, including priority habitats. It is dominated by *Tilio-Carpinetum* oak-hornbeam forests (9170), *Fraxino-Alnetum* and *Carici remotae-Fraxinetum* riparian forests (91E0*), as well as fragments of *Vaccinio uliginosi-Pinetum* swamp forests (91D0*). The main forest-forming species include spruce, pine, as well as pedunculate oak, black alder and hornbeam (Matuszkiewicz, 2019). The vascular flora in the Polish part of the Forest comprises about 1070 species, including 670 typically forest species (Sokołowski, 2004).

⁶ At this stage, the impact of the barrier on the water resources of the Białowieża Forest cannot be assessed in sufficient detail due to the lack of adequate source data. It is recommended to carry out monitoring for several years, taking into account the typical variability of meteorological and hydrological conditions over a multi-year period.

Almost 60 species of mammals have been recorded in the Forest, including numerous and viable populations of large herbivores: bison (*Bison bonasus*), red deer (*Cervus elaphus*), elk (*Alces alces*), roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*) (Krasińska, Krasiński, 2017; Jędrzejewska, Jędrzejewski 2001). They are accompanied by the presence of large predators: a well-preserved population of wolf (*Canis lupus*) and a small population of lynx (*Lynx lynx*) (Jędrzejewska, Jędrzejewski, 2001; Okarma et al., 2021). In the bat fauna, notable is the presence of western barbastelle (*Barbastella barbastellus*) and Bechstein's bat (*Myotis bechsteinii*), that is species which depend on the availability of natural hideouts, such as hollows in old trees (Lesiński, 2019).

Approximately 150 species of birds nest in the Forest, that is 2/3 of the national breeding avifauna (Pugaczewicz 1997; Tomiałoć, Wesołowski, 2004). The high value of the ornithofauna is created by the numerous populations of Eurasian three-toed woodpecker (*Picoides tridactylus*), white-backed woodpecker (*Dendrocopos leucotos*), Eurasian pygmy owl (*Glaucidium passerinum*), as well as collared flycatcher (*Ficedula albicollis*) and red-breasted flycatcher (*Ficedula parva*), that is species the presence of which is strongly dependent on the presence of structurally diverse old-growth forest and abundant dead wood (Tomiałoć, Wesołowski, 2004).

Among approximately 9,600 species of insects found in the Forest, particularly noteworthy are saproxylic beetles, an ecological group including about 1,000 species in the area, among them many relict and nationally rare ones, or species protected by the Habitats Directive - such as *Boros schneideri*, *Pytho kolwensis*, *Buprestis splendens*, *Osmoderma barnabita*, or *Cucujus cinnaberinus* (Gutowski, Jaroszewicz, 2004; Kujawa et al., 2016). The butterfly fauna is also relatively rich, comprising half of the species found in the country (Gutowski, Jaroszewicz, 2004).

Considerable species richness is observed for macromycetes and micromycetes present in the Forest. At least 2000 species of macromycetes have been identified here. Many of them are saproxylic species related to decaying wood, whose presence depends on the temporal continuity of the forest existence and the availability of abundant dead wood (Kujawa et al., 2018; Kujawa, Szczepkowski, 2022). Also noteworthy is the rich and specific biota of lichenized fungi (lichens) and lichenicolous fungi (Kujawa et al., 2016).

2.1.3 Scientific studies

Presented below is a cross-section of selected scientific studies on the nature of the Białowieża Forest. It contains information covering the period from the late 18th century to the present day. It should be emphasized that the following summary does not cover all research conducted in the Forest, but focuses only on key studies.

The first scientific references to the nature of the Białowieża Forest date back to the late 18th and early 19th centuries. Those are incidental data collected usually as a result of short trips of researchers to the Forest. They mainly concern the census of vascular plants, some groups of insects, or the European bison. They also include monographic data on the Białowieża Forest. At the turn of the 20th century, an outline of the history of the Forest was published, along with a description of the forest stands (Karcov 1903).

At the end of the 19th century, more detailed studies of the flora were carried out, covering both vascular plants and some groups of cryptogams (Błoński et al. 1888). At the beginning of the 20th

century, intensive research was carried out on the biology and ecology of the European bison, which, according to the opinion at the time, was in danger of extinction (Wróblewski 1927), as well as inventory work on other species. The results of that research were published in 1917-1919 in Berlin in a series of five research bulletins *Białowieś in Deutscher Verwaltung*.

In 1921, the "Reserve" forest district was established, which was the beginning of the national park - this initiated systematic and more intensive research. Particularly numerous were studies aimed at preparation of inventories of individual systematic groups, which later formed the basis for ecological and biocenotic studies. Prof. Józef Paczoski studied the diversity of forest vegetation and laid the foundation for a new branch of knowledge - phytosociology. Results of those studies also became the basis for the modern economic classification of forest types. Paczoski published a monograph entitled *Lasy Białowieży [Forests of Białowieża]* (Paczowski 1930). Prof. Jan J. Karpiński (the first head of the Park) focused his research on the fauna and ecology of bark beetles (Karpiński 1935).

Until the outbreak of World War II, an almost complete herbarium of vascular plants of the Białowieża Forest had been created. Knowledge of the fungi found in the area and many groups of invertebrates was greatly expanded. The fauna of birds, amphibians and reptiles became better known. Systematic climate research was initiated. A nature and forest inventory was started, including identification of soils. In 1936, Tadeusz Włoczewski set up the first permanent research plots - they included 5 transects where changes in the spatial structure and species composition of tree stands were monitored. In 1937, a permanent post for studying changes in the Earth's magnetic field was located in the Palace Park.

During World War II, research work was virtually non-existent. The forest stand taxation materials, insect evidence collections, the herbarium of vascular plants collected by Prof. Paczoski, as well as equipment of the meteorological station were destroyed.

After the end of World War II, there was a surge of interest in the Białowieża Forest, which led to the development of research in the national park. In the years 1948-1952 prof. J.J. Karpiński led an extensive bioecological research program. Back then, permanent research plots were established, which continued to operate until the 1970s (Karpiński 1949). In the late 1940s, based on research conducted by prof. Dehnel, the phenomenon of changes in the skull size of shrew mammals as a response to seasonal changes in climatic conditions was described, later called the "Dehnel phenomenon" (Dehnel 1949). The International Biological Program was introduced - the primary production of oak-hornbeam forests and secondary production of small mammals were studied in the park. A project to restore the European Bison was implemented successively, accompanied by studies of its morphology, anatomy, physiology, biology and ecology (Kraśńska and Kraśński 2017).

In the second half of the 20th century, the Geobotanical Station of the University of Warsaw started innovative research on the seasonal rhythms of forest ecosystems. The most well-known and significant publications summarizing long-term field observations are *Vegetation dynamics in temperate lowland primeval forests* (Faliński 1986) and *Plant demography in vegetation succession* (Falinski 1991). Also noteworthy is a 4-volume synthesis of studies on the role of cryptogams in forest communities (Faliński and Mułenko eds. 1992, 1995, 1996, 1997). *Atlas obcych gatunków drzewiastych Puszczy Białowieskiej [Atlas of alien woody species of the Białowieża Forest]* was also published (Adamowski 2002 - in cooperation with the Belarusian side). Many years of research by prof. Aleksander Sokołowski, head of the Department of Natural Forests in Białowieża, resulted in

two major publications: *Flora roślin naczyniowych Puszczy Białowieskiej* [*Flora of vascular plants of the Białowieża Forest*] (Sokołowski 1995) and *Lasy Puszczy Białowieskiej* [*Białowieża Forests*] (Sokołowski 2004). The IBL's Department of Natural Forests has conducted long-term monitoring studies of invertebrates (Gutowski 2004), focusing insects which inhabit dead wood (Gutowski et al. 2022). Currently, about 70 research projects are conducted annually within the strictly protected area alone, most of which are multi-year studies. For more than 30 years, the Białowieża National Park has had a network of schematically placed permanent control plots, where a systematic inventory of standing trees, both living and dead, woody debris as well as natural regeneration has been taken. The results obtained are compared with those of previous inventories in the 1950s and 1990s.

More than 40 years ago, a research plot was set up in abandoned grasslands located on the border of the strictly protected area, where the spatial dynamics of populations and changes in species composition were monitored. The results of the study allowed to describe the mechanisms of succession and the various ways in which the forest returned to the river valley, from which it had been removed some 200 years earlier (Falińska 1991).

For almost half a century, there have been ornithological plots within the strictly protected area, where a team of ornithologists monitors, among others, the species composition, density, and breeding success of birds each year. In addition, the team studies the ecology and behaviour of selected species, which still exhibit their primaevial characteristics here. Researchers pay particular attention to species closely associated with old forests and the presence of dead wood (Tomiałoć and Wesołowski 2004; Wesołowski et al. 2006).

A pioneering study of the natural population of the Eurasian lynx was conducted in the Białowieża Forest with the use of telemetry, which made it possible to learn more about the ecology and behaviour of that species in completely natural conditions. In turn, studies of wolves conducted with the use of telemetry techniques have provided insight into the spatial structure of the population and the impact of large predators on populations of ungulate mammals (Schmidt et al. 1997, Jędrzejewski et al. 2001). Various aspects of mammalian biology and ecology are the subject of extensive research on that group of animals, conducted primarily by the Mammal Research Institute at the Polish Academy of Sciences (Jędrzejewska and Wójcik 2004).

The Białowieża National Park has a great significance for studies of the biodiversity of natural primary forests not exposed to direct interference from human activity, especially with regard to insects and saproxylic fungi, as well as avifauna. It is an ideal area to learn about the biology and ecology of organisms associated with dead and decaying wood. A research program devoted to cryptogams and conducted in the 1990s in an area of just 144 hectares provided data on the occurrence and habitat preferences of 1,961 species, including 1,380 species of fungi (Faliński and Mułenko 1996). The number of species present in the park is still not final. Almost every year, several new species present in the area are described, especially fungi and invertebrate species. The Forest has also become the site of large-scale research on the extraction and possible applications of active substances collected from fungi and plants, conducted by the Institute of Forest Sciences at the Białystok University of Technology. The state of knowledge of the fauna was described in the publication *Katalog Fauny Puszczy Białowieskiej* [*Catalogue of the Fauna of the Białowieża Forest*] (Gutowski and Jaroszewicz 2001), but since then numerous materials have been published presenting species new to the Forest.

In the years 2010-2014, an extensive interdisciplinary project entitled *Przyrodnicza historia Puszczy Białowieskiej w świetle badań paleoekologicznych [The Natural History of the Białowieża Forest in the Light of Paleoecological Research]* was conducted. It allowed to reconstruct the history of the Forest's vegetation, taking into account the dynamics of forest communities and the most important forest-forming species, the extent of anthropogenic changes and climate changes regulating moisture conditions in forest habitats over the past several thousand years (Latałowa et al. 2016).

In 2016-2018, an inventory of the Białowieża Forest was taken, commissioned by the General Directorate of State Forests. The core of those works was a network of research plots, nearly 1,400 of which were set up in the Forest, each of them with the area of 400 m². In each studied plot, trees were measured (including those already dead, both standing and lying), soil carbon content was determined, phytosociological studies were conducted, populations of ground beetles and protected saproxylic insects were surveyed, ornithological and herpetological inventories were taken, the conservation status of Natura 2000 forest habitats was determined and archaeological studies were conducted as well.

In the years 2014-2022, an innovative project *Kompleksowy monitoring dynamiki drzewostanów Puszczy Białowieskiej z wykorzystaniem danych teledetekcyjnych [Comprehensive monitoring of the dynamics of the Białowieża Forest stands using remote sensing data]* was implemented, aimed at the development and practical application of a monitoring system for the Białowieża Forest using ground-based monitoring plots and remote sensing data. The results of the project conducted by the Forest Research Institute were presented in the publication *Aktualny stan Puszczy Białowieskiej na podstawie wyników projektu LIFE+ ForBioSensing [Current State of the Białowieża Forest based on the results of the LIFE+ ForBioSensing project]* (Stereńczak ed. 2022).

Implemented within the area of the Forest was the project *Dziedzictwo kulturowe i przyrodnicze Puszczy Białowieskiej [Cultural and Natural Heritage of the Białowieża Forest]* with the aim to document all archaeological sites using non-invasive methods. The works resulted in a three-volume site catalog *Dziedzictwo archeologiczne Puszczy Białowieskiej [Archaeological Heritage of the Białowieża Forest]* (Urbańczyk and Wawrzeniuk 2021).

In Białowieża, in the heart of the Białowieża Forest, three scientific institutions operate: the Department of Natural Forests of the Forest Research Institute (established in 1930), the Mammal Research Institute (established in 1952), and the Białowieża Geobotanical Station of the University of Warsaw (established in 1952). The Białowieża National Park also has its own research lab. The Institute of Forest Sciences of the Białystok University of Technology is located in Hajnówka. Research in the Forest is also conducted by numerous national and foreign scientific institutions.

2.1.4 History

The Polish part of the Białowieża Forest is made up of remnants of former forest complexes: the historic Białowieża Forest and the Bielsk Forest, of which the northern part known as the Lady Forest has survived. The first mention of the Białowieża Forest refers to a hunt of Władysław Jagiełło in 1409 (Długosz 1997). It confirms its status as a grand ducal forest and a game sanctuary for royal hunts. In order to protect this forest complex, a special administration was established to ensure that the introduced restrictions were observed (Hedemann 1939). They mainly concerned a ban on

logging and hunting, but allowed traditional uses, including, among others, meadow mowing, fishing and beekeeping. In 1589, during the reign of Sigismund III Vasa, the Białowieża Forest was incorporated into the royal estate (Hedemann 1939). The restrictive approach to the forest protection changed in the 2nd half of the 17th century, when, due to wars and the destruction that followed, it was necessary to find new revenue sources for the treasury. This was reflected in a more intrusive forest use, consisting mainly in intensified production of forest commodities such as charcoal, potash and tar. Nevertheless, until the end of the First Polish Republic, 90% of the Białowieża Forest was still covered with dense forest, of which 60% of the area was primary or natural forest (Samojlik et al. 2013).

Operations on the front lines of World War I in the summer and autumn of 1915 led to looting of the Białowieża Forest area, consisting in the harvesting of timber for war purposes. A 228-kilometer forest railroad network was built to facilitate timber export (Ciechański 2013). The greatest damage to the nature of the Forest was done during World War I. In three years, several million cubic meters of timber were felled and exported, usually using the clearcutting method. The previously protected bison became easy prey. At the same time, in awareness of the uniqueness of the area on a European scale, various types of scientific research was conducted here. Specialists were brought to Białowieża, including geologists and prehistorian Alfred Götze. The results of the scientists' work were presented in scientific publications (*Białowieża in deutscher Verwaltung 1917-1919*). Also, a museum with a preparation room and laboratories was opened.

In December 1939, the Białowieża National Park area was placed under strict protection, while the rest of the Forest was intensively used. The situation changed with the arrival of German troops in 1941 – the entire Forest became a hunting area and no logging was conducted. In July 1944, the Red Army entered the area, and for the first time the Forest became divided by a national border. Approximately 60,000 hectares remained in Poland, along with the most valuable section protected as a national park. After World War II, another wave of illegal logging and poaching intensified.

After the end of World War II, the Białowieża Forest, outside the area of the Białowieża National Park, was intensely used within the scope of forest management. Only in the 1970s the approach to the resources of the Białowieża Forest changed. The felling age for individual tree species was extended. In 1994, Poland's first Promotional Forest Complex was established here and the importance of the forest's nonproductive functions increased, and in 1996 the Białowieża National Park was enlarged.

The Białowieża Forest was first inscribed on the UNESCO World Heritage List in 1979. Back then, the Site covered just over 5,000 hectares of the Białowieża National Park. The entry was extended in 1992 to include the Belarusian part of the Belovezhskaya Pushcha, creating a single transboundary site. In 2014, almost all of the Białowieża Forest was inscribed on UNESCO's World Heritage List due to the fulfilment of criterion IX - an outstanding example representing significant on-going ecological and biological processes in the evolution and development of ecosystems and communities of plants and animals, and criterion X - a site containing the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

2.1.5 Cultural heritage

The cultural heritage of the Site and its surroundings is the result of historical events, mainly Polish, Ruthenian, Belarusian and Ukrainian cultural influences (Boryczka 2022). For centuries, a cultural identity was built in the area, the foundation for which was the coexistence of different social, ethnic and religious groups. Currently, the area of the Białowieża Forest Property and its surroundings is considered part of the cultural and historical region called Podlasie. Historically, it is a Polish-Belarusian-Lithuanian borderland with no precisely defined boundary of ethnic, cultural and religious influences. Presently, Podlasie is most often identified with the Podlaskie province. Two main traditions: the eastern and the western tradition, and three main cultures: Polish, Belarusian and Ukrainian, coexist here. The spheres of influence and impact of the individual population groups changed over time, but also shifted in space, and the various ethnographic groups lost or gained importance (Moroz-Keczyńska 2006a).

Selected elements of the cultural heritage of the Białowieża Forest:

- A distinctive cultural landscape distinguished by, among others, the layout of fields, toponyms, that is characteristic local names of sacred forest spots and names of localities.
- Settlements, partially with wooden buildings i.e. Polish settlements, Belarusian settlements, Ukrainian settlements, as well as Jewish, German and Russian settlements (Boryczka 2022).
- Religious sites – dominated by Orthodox churches.
- Cemeteries, graves, memorials - there are Roman Catholic, Orthodox, Uniate, Evangelical sites, as well as Jewish cemeteries, a testimony to the life of the Jewish population in the area (Boryczka 2022).
- Sites related to the Białowieża Forest – historic buildings and parks, which are remnants of royal and tsarist gardens (Boryczka 2022). Within the area of the Białowieża Forest, there are: wooden railway stations, wooden forester's lodges, a wooden mansion, the Palace Park.
- Archaeological sites – in the Polish part of the Białowieża Forest, there are 606 archaeological sites currently known (as of the end of 2022), of which only 38 have been entered into the register of monuments.
- Intangible heritage – the Białowieża Forest Property is an area with a very interesting and unique cultural heritage, full of exceptional elements of intangible heritage preserved to this day, which build the local identity and influence the identification of residents with the Białowieża Forest.
- Landscape typology - Within the boundaries of the Site, the landscape is formed by the Białowieża Forest, dominated by natural forest ecosystems. The buffer zone, on the other hand, has produced a mosaic of landscapes shaped as a result of natural processes, interwoven with landscapes transformed by human activity – rural and urban landscapes.
- Beekeeping culture - Beekeeping culture in the Białowieża Forest is a traditional form of caring for wild bees, deeply rooted in the history and identity of local communities. It involves keeping bees in natural beehives or log hives placed in trees, with minimal human intervention in the life cycle of the insects. The practice recreates near-natural conditions, promoting ecological balance and preservation of biodiversity. Beekeeping culture has been inscribed on UNESCO's Representative List of Intangible Cultural Heritage as an example of

sustainable use of natural resources, combining ecological knowledge with the cultural heritage of the region.

2.1.6 Local community

The Hajnówka district⁷, where the Site is located, lies in the southeastern part of the Podlaskie province, near the country's border with the Republic of Belarus, and is part of the external border of the European Union. This geopolitical factor is important for the direction of local development and the barriers related to the Site management.

The Hajnówka district comprises nine municipalities of varying administrative nature: the urban municipality of Hajnówka, the urban-rural municipality of Kleszczele and seven rural municipalities: Białowieża, Czeremcha, Czyże, Dubicze Cerkiewne, Hajnówka, Narew and Narewka. The rural municipalities Białowieża, Hajnówka, Dubicze Cerkiewne, Narew and Narewka lie partially within the area of the Białowieża Forest World Heritage Site, while the other municipalities of the Hajnówka district lie in the buffer zone of the Site.

Demographic aspects

The Hajnówka district is one of the districts with the lowest population density in Poland - at the end of 2021, the average population density in the district was 25 residents/km² (this was 4 residents less than in 2011). A lower population density was recorded in 2021 only the Bieszczady district (Podkarpackie province) – 18 residents/km², and the Sejny district (Podlaskie province) – 22 residents/km². Population density in the Hajnówka district shows significant variation, in the town of Hajnówka at the end of 2021 it was 915 residents/km², in the rural municipality of Czeremcha – 29 residents/km², in the urban-rural municipality of Kleszczele – 16 residents/km², while the lowest density was recorded in the rural municipality of Dubicze Cerkiewne – 9 persons/km², and in the municipalities of Białowieża and Narewka – 10 persons/km².

Infrastructure

The level of social and economic development, as well as the directions of the local development policy are also influenced by access to the infrastructure related to environmental protection and quality of life. At the end of 2021, in the Hajnówka district 92.5% of the total population used the water supply system (in 2011 it was 91.5%). The sewage network was used by 63.7% of the residents in 2021 (58.6% in 2011). The gas system at the district level was used in 2021 by 0.2% of the residents (in 2011 it was 0%). Thus, the decisive local source of pollution is emission from individually heated homes (so-called "low emission"). In the immediate vicinity of the Białowieża Forest (municipalities adjacent to the Forest borders), coal accounts for 50 to 70% of the energy mix, while biomass accounts for 14 to 20%. Coal and biomass are burned in nearly 10,000 locations in the immediate vicinity of the Białowieża Forest. The average number of zero-emission locations is currently estimated at about 22% of all buildings, while low-emission sources, such as gas or heating oil, are used in 6% and 1% of buildings in the area, respectively.

⁷ Analyzed was the Hajnówka district. The municipalities of the Białowieża Forest, apart from all municipalities of the Hajnówka district, include also the municipality of Michałowo, located in the Białystok district.

The transport system of the region is based primarily on provincial roads, connecting Hajnówka with neighbouring district towns and municipal localities, including Białowieża, Narewka and Kleszczewo. To the west of the Forest, there are national roads connecting the region to the rest of the country. The road system is complemented by a railway line running along the western border of the forest complex and joining the Forest region with the rest of the province and the country as well as Belarus through railroad border crossings. Within the area of the Site and buffer zone, there are abandoned railway tracks connecting Hajnówka and Białowieża, as well as narrow-gauge railway lines, some of which are used in the summer season for tourist purposes.

Public participation

Local community development is manifested, among others, in the building of a self-governing community and the involvement of the public in decision-making (i.e. public participation). As presented in the chapter on the *Plan's* stakeholders, various groups of local actors have an interest in the development process of this document. They are listed on the stakeholder map (chapter 1.3). Crucial from the point of view of local community analysis and the possibility of influencing local policies are the participation procedures in place. Most of the municipalities in the Hajnówka district use basic forms of participation – only the Hajnówka municipality has implemented more advanced forms and developed rules of public consultations, which are made available on the municipality's website. In addition, within the framework of the *HajnówkaOdNowa Zielona Transformacja [Green Transformation]* project, the municipality conducted regular public votes on projects to be implemented or on locations of selected projects. All municipalities in the Hajnówka district offer participation in the following areas: information about the planned adoption of a document concerning municipal development, possibility to submit an opinion on the issue being the subject of consultations, and organization of meetings to present plans of the municipality (it is also possible to express opinions on those plans).

Land use

The land use structure of the Białowieża Forest Site is dominated by forest land, which constitutes more than 95% of its area. In Hajnówka district, the forestation rate is 53.7%, with significant spatial variations. The highest forestation rate is recorded in the municipalities of Białowieża (87.8%) and Narewka (67%), while the lowest forestation rate is recorded in the urban municipality of Hajnówka (4%) and the municipality of Czyże (10.4%). The remaining small portion consists mainly of meadow and swamp areas in river valleys and mid-forest clearings. The buffer zone surrounding the Site includes forest land, which accounts for about 50% of its area, agricultural land, which accounts for about 45%, and built-up areas (including rural areas). To the north, the natural border of the Białowieża Forest complex runs along the Narew River valley, the Siemianówka artificial water reservoir located within it, and the neighbouring agricultural areas. Spatial development of agriculture and the related settlement has limited the Forest to the west and south.

The municipalities in the Białowieża Forest region recognize the opportunities and constraints related to their location in the vicinity of the Forest, and try to reconcile development (including services and production) with environmental functions in order to ensure local growth and preserve the natural environment. The spatial development policy pursued by the municipalities takes into account the presence of valuable natural areas, in particular forests and river valleys, the need to preserve the spatial continuity of the natural system of the region and to protect its functioning.

The presence of natural areas protected by the law influences the socio-economic development of the municipalities in the Hajnówka district. Those areas cover 57.4% of the district. The highest rates are recorded in the municipalities of Białowieża with 99.9% of the area (with the Białowieża National Park representing 29.8%) and Narewka 98.6% (with the Białowieża National Park representing 13.2%), while the lowest values are in the town of Hajnówka with 1.3% of the area and the municipality of Czeremcha with 0.4% of the area.

The high forestation rate and the high percentage of the area subject to various legal forms of nature protection affect the directions of the socio-economic development as well as the labour market. They offer opportunities, but also pose constraints on economic activity.

Economic activity

By the end of 2021, 911 national economic entities were recorded in Hajnówka district⁸ (a decrease by 69 entities compared to 2011). The vast majority of the entities, i.e. 645 operated in the buffer zone of the Site (a decrease by 91 compared to 2011), and 266 in the municipalities located within the area of the Białowieża Forest Site (an increase by 22 compared to 2011).

When analysing the local labour market, special attention should be paid to the changes which took place in the years 2011-2021 in three rural municipalities: Białowieża, Hajnówka and Narewka, which cover the Białowieża Forest Site. In the area, in the analysed group of sections (A, G, I, R), the largest number of entities operated in section G, similar to the Hajnówka district. Compared to 2011, the number of G-section entities increased by 12.4%, and the highest percentage of G-section entities in the total number of entities was recorded in the rural municipality of Narewka (18.4%).

The most significant changes were recorded in Section I, that is accommodation and catering activities, accounting for 12.9% of the total number of entities in the analysed area. The number of entities in that section during the analysed period increased by 220.0% from 30 (2011) to 96 (2021).

The transformation of the local labour market in the municipalities located within the area of the Białowieża Forest Site is evidenced by the significant decrease (by 55.6%) within the analysed period in the number of entities operating in the agriculture, forestry, hunting and fishing section (section A) from 108 entities at the end of 2011 to 48 entities at the end of 2021.

At the end of 2021, 5.4% of the working-age population in the Hajnówka district was unemployed - 5.3% in the municipalities within the Białowieża Forest area and 5.5% in the municipalities in the buffer zone. The largest group among the unemployed were the long-term unemployed over 50 years of age.

⁸ Analysis of the local labor market by Statistics Poland in Białystok. First, 5 sections of the Polish Classification of Activities were selected, relevant to the Site's impact on the local labor market, that is:

- section A - agriculture, forestry, hunting and fishing,
- section G - wholesale and retail trade; repair of motor vehicles, including motorcycles,
- section I - accommodation and catering activities:
- section R - activities related to culture, entertainment and recreation,
- section T - households employing workers; households producing goods and providing services for their own needs (in the following part of the analysis, this section is omitted as no national economic entities were recorded in the REGON register for this section).

Development programming

The conditions arising both from the specifics of the area and the social aspects are addressed in strategic and planning documents. The location of the Białowieża Forest region on the peripheries of the province and the country results in the need to develop the transport system, which is one of the development objectives for the region. The borderland location supports the need to take steps for the development of cross-border cooperation. It also assumes the need to increase the resilience of the province's spatial structure to potential threats to energy security as well as its defence and security capabilities.

Another objective for the development of the region and the province is to strengthen its cohesion in the process of sustainable territorial growth and modernization of spatial development of rural areas using their internal potential, regional specialization and proximity to the national border. It assumes the need for, among others, modernization and development of agriculture, food processing and the agricultural environment, development of the tourism and leisure offer as well as the functional area of the borderland. In the context of tourism development, emphasized is the need to diversify tourist movement through, among others, the development of diversified infrastructure throughout the whole region, such as bicycle paths and tourist shelters. It also noted that steps must be taken to make greater and more effective use of the potential of the regional brand of the Białowieża Forest. Strategic documents at the district level as well as those of individual municipalities emphasize the need to manage tourism development, including tourist movement, and to create and promote tourism products.

Natural values, including the area of the Białowieża Forest, are considered important to the character of the province and the building of its competitive advantage. The Białowieża Forest is recognized as one of the province's tourist regions of international importance, predestined for the development of sightseeing, nature and cultural-ethnic tourism and recreation (*Diagnoza strategiczna województwa podlaskiego [Strategic Diagnosis for the Podlaskie Province]*, 2019). It should also be noted that Hajnówka is mentioned in *Strategia na rzecz odpowiedzialnego rozwoju [Strategy for Responsible Development]* (2017) as one of 122 towns and cities (nationwide) which are losing their socio-economic functions. *Strategia rozwoju województwa podlaskiego [Development Strategy for the Podlaskie Province]* (2020) identifies rural areas, including valuable natural areas, as one of the areas for strategic intervention. In those areas, it is proposed to focus on measures aimed at achievement of operational objectives related to high-quality space, as well as the development of entrepreneurship in combination with the activation of residents. In the area of entrepreneurship, the development of organic and sustainable forms of agricultural production and the related development of high-quality food processing will be of key importance.

Contribution of the Białowieża Forest to the local community

Forests contribute to environmental stability, economic prosperity and offer production, ecological and socio-cultural services. The Białowieża Forest can provide irreplaceable natural benefits, supporting biodiversity, carbon sequestration, water balance, erosion control, combating desertification and prevention of natural threats. As estimated, with 100,000 tourists visiting annually, the Forest brings benefits from its recreational functions in the amount of about PLN 11.5 million per year. The total recreational value of the Forest as a resource which generates

monetary value was valued at PLN 287 million, assuming an interest rate close to 4% (Boćkowski and Rogowski 2018).

According to the approach of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), forest ecosystems, both natural and managed ones, provide many natural benefits, which are classified into three categories: regulatory contributions, tangible contributions, and intangible contributions. The IPBES approach emphasizes local and traditional knowledge as well as cultural natural benefits.

As part of the participatory process of the *Plan* development, the various aspects of the Białowieża Forest importance as perceived by the local community were discussed with stakeholders (table 2). Contributions of current and historical significance were discussed.

Table 2. Contribution of the Białowieża Forest Site to local communities
(own compilation based on Vasseur and Siron 2019)

Regulatory contribution	
Provision of habitats for different species Food and rest for migratory species	Provision of habitats essential to the life cycle of species
Reproduction and spread of species Pollination and seeds	Ensuring of conditions for the reproduction process of fungi, plants and animals
Regulation of air quality	Capturing of dust, aerosols, chemicals from the atmosphere
Climate regulation	Capture and storage of carbon from greenhouse gases – impact on climate formation
Protection and treatment of soil	Prevention of erosion, accumulation of organic material, impact on nutrient cycling
Protection and treatment of water resources	Water filtering and retention
Protection against threats and extreme events (floods, landslides)	Reduction of the scale of damage caused by extreme weather events by creating disaster protection zones
Reduction of harmful organisms and biological processes	Regulation of population dynamics (e.g., predator-prey relationships), population regulation of species considered pests and invasive species as well as disease-carrying species
Material contribution	
Provision of energy	Provision of raw materials for biomass-based fuel production
Provision of food	Ensuring of conditions for the production of food (e.g., berries, mushrooms, honey) and feed (mid-forest meadows)
Provision of materials and work	Provision of wood, fibre, water, provision of jobs
Provision of healing resources	Provision of mushrooms and plants used as traditional medicines or raw materials in the pharmaceutical industry
Intangible contribution	
Education and inspiration	Creation of conditions for the development of education, knowledge and skills, inspiration for the arts
Mental and physical experiences	Creation of opportunities for sports, recreation, leisure, tourism; enjoyment of life through contact with wildlife
Support of identity (spirituality)	Provision of a basis for religious, spiritual and social experiences
Provision of opportunities to support a good quality of life	Resilience of ecosystems in the face of environmental changes (e.g., strengthening of adaptation to climate change)

Workshop participants identified additional benefits, including fire protection (regulatory), provision of firewood to local people and supply of wood needed to build traditional houses (tangible), cultural heritage, language, religion (intangible). None of the various types of natural benefits was considered crucial by stakeholders. They attributed the greatest importance to benefits related to mental and physical experiences (contribution to people's lives: intangible). The lowest importance was assigned to the following types of benefits: protection against threats and extreme events (floods, landslides - regulatory contribution to people's lives) and provision of energy (material contribution).

2.2 Forms and methods of nature conservation

2.2.1 Białowieża National Park

The Białowieża National Park (BNP) covers the central part of the Białowieża Forest Site with an area of 10,517.27 hectares, which is 17.6% of the Polish part of the Site. A protection zone of 3,224.26 hectares has been established around the Park. The location of the Park is shown on the map presenting the forms of the national system of protected areas (Fig. 4).

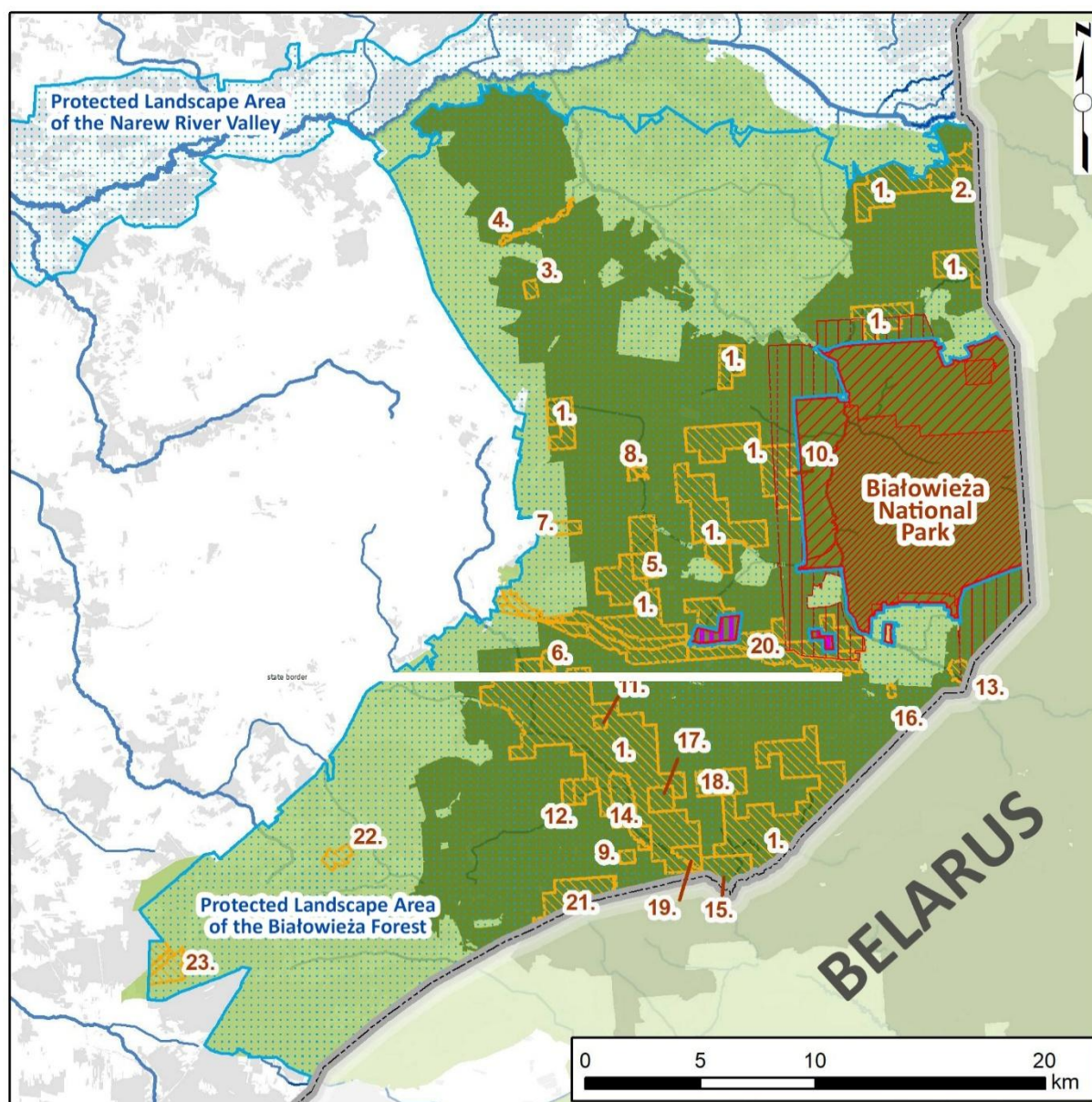
The BNP has been established to protect globally unique natural forest complexes with primary features. Within the boundaries of the Park lies the most ecologically valuable area of the Polish part of the Białowieża Forest. The largest area is covered by forest ecosystems - 9783.53 hectares, non-forest terrestrial ecosystems - 534.58 hectares, and aquatic ecosystems - 19.19 hectares. About 800 species of vascular plants, including 81 protected species, about 200 species of mosses, including 31 protected species, about 350 species of lichens, including 63 protected species, and more than 3,000 species of cryptogams and fungi have been recorded in the area of the Park. The fauna of the Park consists of about 10,500 species of invertebrates, including 84 protected species, about 25 species of fish, including 4 protected species, 11 protected species of amphibians, 8 protected species of reptiles, about 120 species of breeding birds, including 108 protected species, and about 60 species of mammals, including 37 protected species.

To protect the nature of the Park, a conservation plan for the Białowieża National Park has been adopted, based on the Ordinance of the Minister of the Environment of November 7, 2014 on the adoption of a conservation plan for the Białowieża National Park (Journal of Laws 2014, item 1735). The *Plan* has simultaneously become a conservation plan for the part of the Natura 2000 PLC 2000 Białowieża Forest, overlapping with the Park. The main objectives of nature conservation in the Park are as follows:

In order to preserve the values of the Park, its area has been divided into three protection zones:

- strict protection (57.6%), where protection is ensured through the complete abandonment of human interference, in order to preserve the natural condition of ecosystems and the natural processes taking place there. The area is dominated by forest ecosystems with oak-hornbeam forests, oak-spruce-pine forests and sparse pine and spruce forests, while ash and alder riparian forests dominate along the rivers,
- active protection (39%), where human intervention is allowed, and activities are aimed at restoration of ecosystems and nature components as close as possible to their natural state, preserving natural habitats and habitats of plants, animals and fungi,

- landscape protection (3.4%), where landscape values and non-forest communities are protected and where conservation measures for the European bison population are introduced.



Explanations

state border	Białowieża National Park
UNESCO area	strict protection zone
UNESCO buffer zone	active protection zone
1. nature reserves	landscape protection zone
protected landscape areas	Protection Zone of the Białowieża National Park

Fig. 4. Location of nature conservation forms of the national system of protected areas (KSOCh) in relation to the Białowieża Forest Site (own compilation based on GDOŚ data)

Designation of reserves: 1. Natural Forests of the Białowieża Forest; 2. Siemianówka; 3. Gnilec; 4. Waliczówka Valley; 5. Dębowy Grąd; 6. Głębokki Kąt; 7. Lipiny in the Białowieża Forest; 8. Szczekotowo; 9. Sitki;

10. Pogorzelce; 11. Nieznanowo; 12. Michnówka; 13. Wysokie Bagno; 14. Olszanka Myśliszcze; 15. Kozłowe Borki; 16. Podolany; 17. Berezowo; 18. Podcerkwa; 19. Przewłoka; 20. Władysław Szafer Landscape Reserve; 21. Starzyna; 22. Czechy Orlańskie; 23. Jelonka

2.2.2 Nature reserves

There are 21 nature reserves within the area of the World Heritage Site (accounting for 20.2% of the area of the Polish part of the Site). In addition, two reserves are located in the Site's buffer zone. The map (**Błąd! Nie można odnaleźć źródła odwołania.**, item 2.2.1) shows the location of the reserves against in relation to the Białowieża Forest Site.

The following nature reserves are located within the area of the Białowieża Forest Site: Natural Forests of the Białowieża Forest, Siemianówka, Gnilec, Dolina Waliczówki, Dębowy Grąd, Głęboki Kąt, Lipiny in the Białowieża Forest, Szczekotowo, Sitki, Pogorzelce, Nieznanowo, Michnówka, Wysokie Bagno, Kozłowe Borki, Podolany, Berezowo, Podcerkwa, Przewłoka, Władysław Szafer Landscape Reserve, Starzyna, Olszanka Myśliszcze.

Within the buffer zone of the Site lie the following reserves: Czechy Orlańskie and Jelonka.

For the reserves: Głęboki Kąt, Szczekotowo, Sitki, Pogorzelce, Nieznanowo, Michnówka, Kozłowe Borki, Podolany, Berezowo, Podcerkwa, Przewłoka, Olszanka Myśliszcze and Czechy Orlańskie conservation plans have been adopted. For the reserves: Natural Forests of the Białowieża Forest, Dębowy Grąd, Lipiny in the Białowieża Forest, Władysław Szafer Landscape Reserve and Starzyna, conservation tasks have been established. For the remaining reserves (Gnilec, Siemianówka, Waliczówka Valley, Wysokie Bagno and Jelonka), there are no conservation plans and no conservation tasks have been established.

2.2.3 Protected Landscape Area

Outside the BNP area, the Białowieża Forest site is located within the Protected Landscape Area "Białowieża Forest". A significant part of the Site's buffer zone is also located within that area, with the exception of a small section to the north, which lies within the "Narew River Valley" Protected Landscape Area. The protected landscape areas are shown on the map presenting the protection forms of the national system of protected areas (Fig. 4, item 2.2.1).

The Protected Landscape Area "Białowieża Forest" was established on 1.01.1986. It covers an area of 76,303.14 hectares. The purpose of its establishment is the active protection of the ecosystems of the Białowieża Forest, consisting in the preservation of biodiversity as an area constituting refuges of natural lowland primeval forests and distinguished by high landscape, cultural and recreational values. Presently, the area is protected under Resolution No. XXIII/203/16 of the Podlaskie Province Assembly of March 21, 2016 on the Protected Landscape Area "Białowieża Forest" (Journal of Laws of Podlaskie Province of 2018, item 2911).

The Protected Landscape Area "Narew River Valley" was established on January 1, 1986. It covers 42,204.01 hectares. The area was established to protect and preserve biodiversity of the Narew river valley, with its numerous meanders and oxbow lakes, as a place distinguished by its high natural, landscape and cultural values, and also serving as an ecological corridor. The area has also been

recognized as a location allowing to meet tourism and recreation needs. At present, the area is protected under Resolution No. XLV/631/2022 of the Podlaskie Province Assembly of September 26, 2022 on the Protected Landscape Area "Narew River Valley" (Journal of Laws of Podlaskie Province of 2022, item 4215, as amended).

2.2.4 Natura 2000 areas

The Białowieża Forest site, along with a significant part of the buffer zone, is located within the Natura 2000 area PLC200004 Białowieża Forest. It is a special bird protection area and a special habitat protection area. In addition, located within the buffer zone of the Site are parts of other Natura 2000 areas PLH200010 Refuge in the Upper Narew River Valley, PLB200007 Upper Narew River Valley, and PLH200019 Jelonka. The location of the Natura 2000 areas mentioned above is shown on the map (Fig. 5).

PLC200004 Białowieża Forest

The area covers 63,147.6 hectares and includes the Białowieża Biosphere Reserve. About 240 bird species nest in the area, including at least 45 species of birds listed in Annex I of Council Directive 79/409/EEC and 12 species listed in the Polish Red Book. Almost 80% of the Białowieża Forest area is covered by habitats listed in Annex I of Council Directive 92/43/EEC. 12 Natura 2000 habitat types are present here, 10 of which are subject to protection within the area.

By the Order of the Regional Director for Environmental Protection in Białystok of November 6, 2015 on the adoption of a plan of conservation tasks for the Natura 2000 area Białowieża Forest PLC200004 (Journal of Laws of Podlaskie Province of 2015, item 3600), a plan of conservation tasks was adopted. The plan of conservation tasks lists threats to the objects of protection as well as conservation measures. The plan identifies the following main threats (existing and potential): alien invasive species, biocenotic evolution, removal of dead and dying trees, forest and plantation management and use of forests and plantations, change in water relations due to land filling, land improvement and drainage, plant succession, as well as biotic and abiotic natural processes. To reduce the consequences of the identified threats, conservation measures have been introduced, aimed at: maintenance of proper water relations, broadening of knowledge about the objects of protection, adjustment of the tree stand composition according to the habitat, renaturalization of tree stands, preservation of at least the area of natural habitats and species habitats confirmed during the development of the Plan of conservation tasks, as well as the number of species, and guarantee of permanent presence of dead trees. Based on the Order, a conservation plan should be developed for the Natura 2000 area.

In August 2024, public consultations were held on the draft conservation plan for the Natura 2000 area Białowieża Forest PLC200004, with the exclusion of the Białowieża National Park. At the time of the preparation of the *Management Plan...* a conservation plan for the above-mentioned area has not been adopted.

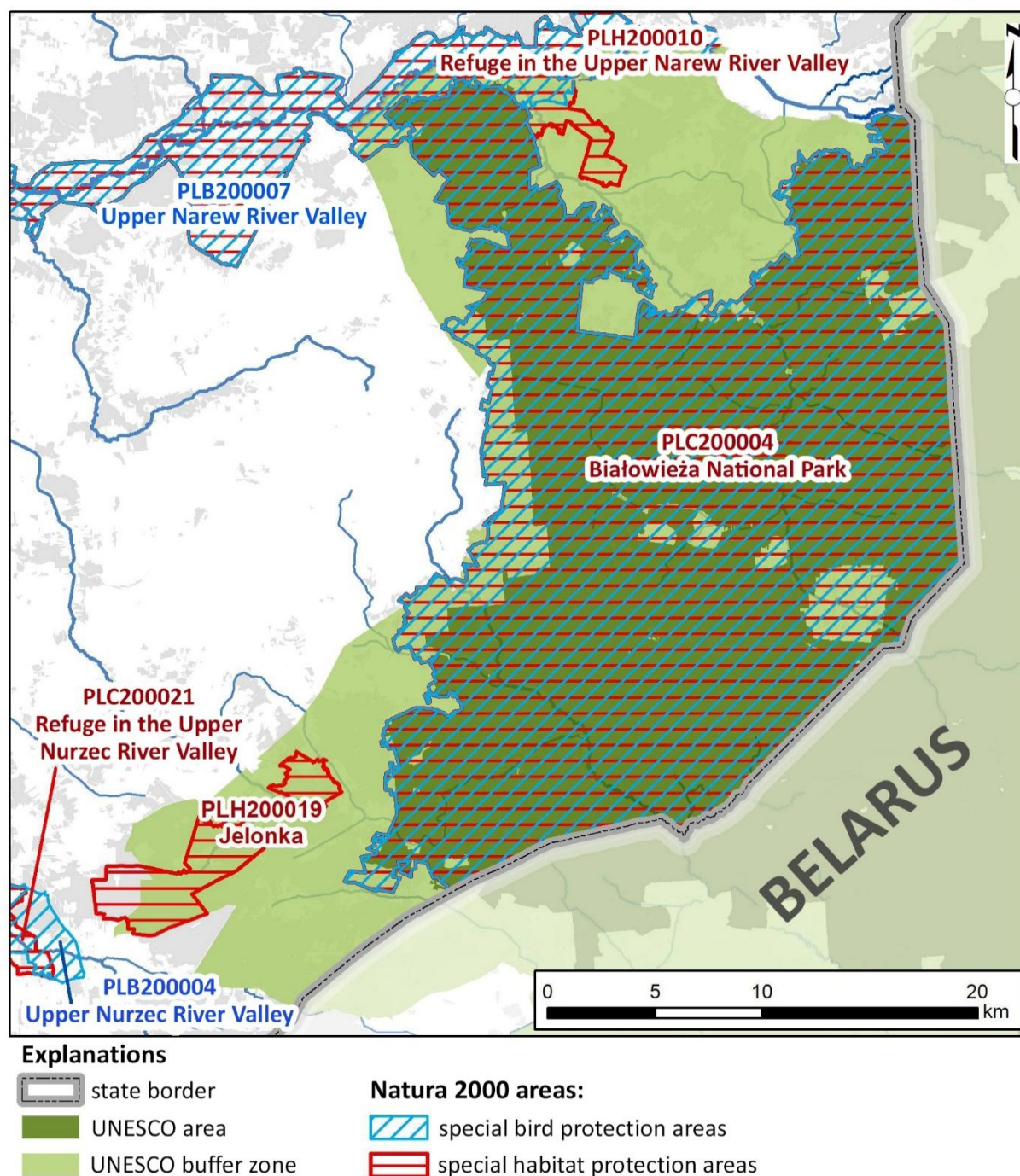


Fig. 5. Location of Natura 2000 areas in relation to the Białowieża Forest Site (own compilation based on GDOŚ data)

PLH200010 Refuge in the Upper Narew River Valley

The area covers 19,090.18 hectares, occupying the valley of the Narew River from the dam in Bondary to Suraż, together with an adjacent pond complex supplied with water from the Liza River system (a Narew tributary). In the area in question, the bed of the Narew River has a natural character – it meanders, with the width of the valley ranging from 0.3 to 3 km. The eastern part of the area lies within the buffer zone of the Site.

A plan of conservation tasks has been adopted for the area (Order of the Regional Director for Environmental Protection in Białystok of June 18, 2014 on the adoption of a plan of conservation tasks for the Natura 2000 area Refuge in the Upper Narew River Valley PLH200010, Journal of Laws of Podlaskie Province of 2014, item 2339). The document identifies the main threats (existing and potential) to the objects of protection. Those include: forestry and plantation management, removal of dead and dying trees, land filling, land improvement and drainage, angling, modification of water functioning and eutrophication or pollution. In response to those threats, conservation measures have been identified to preserve natural habitats and species habitats in a not-worsened state, improve the condition and the functioning of species habitats, maintain an adequate status of species populations, and broaden the knowledge about the objects of protection.

PLB200007 Upper Narew Valley

The area covers 18,384.08 hectares in the Narew river valley at the section from the dam in Bondary to Suraż, together with an adjacent pond complex, supplied with water from the Liza river system (a Narew tributary), located near Suraż. A small eastern part of the area overlaps with the buffer zone of the World Heritage Site.

A plan of conservation tasks has been adopted for the area (Order of the Regional Director for Environmental Protection in Białystok of June 18, 2014 on the adoption of a plan of conservation tasks for the Natura 2000 area Upper Narew River Valley PLB200007, Journal of Laws of Podlaskie Province of 2014, item 2338). The following main threats have been identified: changes in water relations due to land filling, land improvement and drainage, plant succession, burning, change of the land use, including abandonment of grazing, and predation. In response to those threats, conservation measures have been identified to broaden the knowledge about the objects of protection, preserve species habitats in a not-worsened state, including breeding sites, increase and maintain the volume of dying and dead trees in stands.

PLH200019 Jelonka

The area covers 2479.9 hectares and lies entirely within the southwestern part of the buffer zone of the Białowieża Forest Site. It includes the Jelonka nature reserve located on sandy wastelands, former agricultural lands, and the Czechy Orłańskie reserve, which is a remnant of the former Bielska Forest.

A plan of conservation tasks for the area has not been adopted (documentation for the plan was prepared in 2013, but there is no order of the Regional Director for Environmental Protection in Białystok to adopt the plan).

2.2.5 Species protection

Within the area of the Białowieża Forest Site there are 5 species of birds which require the establishment of protection zones for refuges, breeding sites and sites of regular stay of birds under species protection (lesser spotted eagle *Clanga pomarina*, white-tailed eagle *Haliaeetus albicilla*, black stork *Ciconia nigra*, boreal owl *Aegolius funereus*, Eurasian pygmy owl *Glaucidium passerinum*) and 1 species of lichen (tree lungwort *Lobaria pulmonaria*), for which protection zones of the

location and the refuge have been established. Bird protection zones are divided into all-year and periodic protection zones, with periodic protection dates set for each species⁹.

2.2.6 Biosphere Reserve

The Białowieża National Park Biosphere Reserve was established on January 17, 1977 as part of the international UNESCO-MAB program. In June 2005, the biosphere reserve status was extended to include the area of the entire Polish part of the Białowieża Forest, covering its protection zone protected since 1988 as the Białowieża Forest Protected Landscape Area. At present, the Białowieża Biosphere Reserve covers 92,399 hectares (that is an area 20 times larger than the initial one).

The Biosphere Reserve is a place of significant natural values, where the protection of biological and cultural diversity should go hand in hand with economic and social development. The reserve should fulfil three interrelated functions: protect cultural and biological diversity, promote and implement sustainable development, and support environmental research, monitoring and education.

2.2.7 “Białowieża Forest” Promotional Forest Complex

The “Białowieża Forest” Promotional Forest Complex was established by order of the General Director of the State Forests on December 19, 1994. It includes part of the Forest managed by the State Forests (forest districts: Białowieża, Browsk and Hajnówka).

The primary objectives of the establishment of the “Białowieża Forest” Promotional Forest Complex include:

- preservation of the natural conditions of the forest environment throughout the Forest mesoregion,
- preservation or restoration of proper habitats of primeval forest biocenoses of natural character, and ensuring the sustainability of forest ecosystems and the continuity of multilateral use of their resources,
- development of a model for the inclusion in the comprehensive conservation and restoration policy and improvement of forests in larger forest complexes with similar geographic and natural conditions,
- research work and forestry experimentation to draw conclusions on the possibilities and conditions for the popularization of the eco-development principles throughout the whole area of State Forests (Regional Directorate of State Forests in Białystok 2021).

An expression of the tasks of the “Białowieża Forest” Promotional Forest Complex within the scope of nature conservation is the presence on its territory of protection forests (protecting special functions of forests, where the use of timber resources as found in commercial forests is limited) as well as reserves and other forms of nature protection. Conservation tasks (large-scale protection and preservation) are included in forest management plans.

⁹ The register of protection zones is kept by the Regional Director for Environmental Protection in Białystok, in accordance with the Act of April 16, 2004 on nature conservation (consolidated text Journal of Laws of 2024, item 1478).

In recent decades, in accordance with the principles of sustainable and balanced forest management¹⁰, the productive (economic) function of Polish forests has been reduced in favour of protective and social functions. The implementation of multifunctional forestry has legalized public participation in forest management, and the establishment of the “Białowieża Forest” Promotional Forest Complex was followed by the appointment its Scientific and Social Council with significant participation of representatives of local governments, interest groups, institutions, economic organizations and others. Following the discussion on programs related to the Forest, integrative processes are taking place, facilitating the transfer of information about the objectives of multifunctional forestry and methods of nature protection in a commercial forest (Szujecki 2008).

The shaping of the natural environment of the Promotional Forest Complex also takes place through special forms of protection, general-purpose protection forests, special-purpose protection forests, as well as by conducting forest service trainings and environmental education of the public.

In order to achieve the abovementioned objectives, the forests of the “Białowieża Forest” Promotional Forest Complex are covered by the special holding of the 1st and 2nd category as well as three zones with different protection levels, according to the natural values.

Table 3. Categories of protection forests in the forest districts of the Białowieża Forest

Forest category	Forest District Białowieża ^a	Forest District Browsk ^b	Forest District Hajnówka ^c
	Area [ha]		
Reserves*			
-	4,134.22	1,875.63	5,152.25
Protection forests**			
water protection	2023.94	5335.61	4083.22
soil protection	-	1.71	-
valuable parts of native nature	5616.66	9451.49	7289.31
research	13.27	14.45	123.24
seed	-	40.49	53.80
animal refuges	272.39	1020.73	767.75
in and around towns	-	-	47.76
defensive	-	-	423.32
Protection forests in total	7926.26	15864.48	12788.40

*Data on the area of reserves in individual forest districts come from a. Forest Management Plan of the Białowieża Forest District 2011; b. Forest Management Plan of the Browsk Forest District 2011; c. Forest Management Plan of the Hajnówka Forest District 2011

** Data on the area of protection forests come from a. Decision of the Ministry of the Climate and Environment, ref. no.: DLŁ-WGL.8101.15.2022.LP of August 11, 2022; b. Decision of the Ministry of the Climate

¹⁰ In accordance with the Forest Act and Poland's obligations within the framework of the ministerial process of protection of forests in Europe (formerly MPCFE, now Forest Europe), to which Poland has been a signatory since 1993.

and Environment, ref. no.: DLŁ-WGL.8101.14.2022.LP of July 22, 2022; c. Decision of the Ministry of the Climate and Environment, ref. no.: DLŁ-WGL.8101.13.2022.LP of July 22, 2022

2.3 Outstanding Universal Value

Among the 231 natural sites inscribed on the World Heritage List, 89 are forest properties. Of all UNESCO-listed sites (1226), about two hundred include unique forest ecosystems (as of May 2025). The vast majority of them lie in the tropical zone, and only a few are in the Palearctic. The Białowieża Forest is one of the last existing and best-preserved natural forest complexes of primary character in lowland Europe. Thanks to the six centuries of conservation history and the strict protection established in parts of the complex in the early 20th century, it has retained its unique character. Its greatest value is the diversity of habitats and species, as well as natural processes occurring continuously for thousands of years. Although traces of human presence from several thousand years ago can be found in the Białowieża Forest, it has not been intensively used, and administrative measures applied due to the use of the complex for elite hunting by successive rulers have provided the necessary protection and prevented the use of forest stands. Numerous studies have confirmed that the Białowieża Forest has retained its original character (Faliński 2003, Wesołowski 2005, Latałowa et al. 2016), and the uniqueness of this complex compared to other forests of Poland and Europe has been emphasized in multiple studies (among others, Sokołowski 1994, Brzeziecki 2017, Hilszczański and Jaworski 2018).

2.3.1 Białowieża Forest as an example of unique ecological processes (Criterion IX)

The Białowieża Forest is a unique example of ecological and biological processes typical of natural lowland forests of the temperate climate zone, occurring since the last glaciation. Climatic conditions and biological processes were the primary factors shaping the ecosystems of the Białowieża Forest. Human impact on those ecosystems was significantly reduced over the centuries until World War I. Part of the Forest avoided destruction caused by logging during World War I and was placed under strict protection already in the third decade of the 20th century. In a large area of the Forest, forest management was limited and modified, which has allowed to maintain the continuity of natural processes. Palynological studies prove the unique status of the preservation of the Forest's ecosystems over the last several thousand years, manifested in the scarcity of taxa characteristic of anthropogenic habitats in the studied sediments (Latałowa et al. 2016). The negligible scale of anthropogenic transformation, both in prehistoric and historical times, is reflected in the current state of the Forest, which has largely preserved the natural character of forest communities. The forms of use of the Forest practiced in the past have largely allowed to preserve the continuity of forest habitats and the natural regeneration of tree stands (Kujawa et al. 2016).

The stands of the Białowieża Forest have a multi-layered and age-differentiated structure. The dominant processes of fluctuation and regeneration ensure a continuous relationship between the individual components and the environment, as well as the active, key role of biotic factors. The latter include the toppling of trees and the emergence of new vegetation, the rooting by wild boars, the direct impact of herbivores such as deer, roe deer, elk and European bison on the forest, and the relationship between herbivores and predators. All those factors support the emergence of new ecological niches, especially important for cryptogams and invertebrates. The results of studies

conducted in the strict protection area compared to the data obtained during the inventory taking in the 1950s and 1990s show major changes in the percentage composition of tree stands. The share of spruce has decreased significantly. The area share of oak remains more or less constant. Other species, such as linden and hornbeam, have increased their area share. The decline in the share of spruce is directly caused by more intense and frequent gradations of the European spruce bark beetle. However, it should be noted that bark beetle gradations are a secondary factor, as bark beetles attack trees which are already weakened by other factors, such as long periods of drought, strong winds which damage trees, high temperatures or lowered groundwater levels (Keczyński 2002).

The Białowieża Forest is a habitat for the entire community of ungulates found in Poland (with the exception of mountain species), large predators such as the lynx and the wolf, as well as small mammals and birds typical of forest areas. All of those species function in a complex and intricate system of dependencies. The Forest is one of the few areas in the world where trophic relationships between plants, herbivores and predators can be observed in a form untransformed by human activity, in parallel with the overlap of ecological niches of related species. Many of the phenomena cited in the scientific literature were observed for the first time in the Białowieża Forest, for example the “Dehnel effect”, the dependencies between the number of rodents and the fruiting of forest trees, and the effect of predators on ungulate populations (Zub 2009). Also the effect of strong herbivore pressure on the forest ecosystem can be observed here.

An invaluable natural resource is dead wood, which is of great importance for the dynamics of tree stands and the circulation of chemical elements in forest ecosystems. Wood comes in different forms, sizes, and is located differently within the ecosystem – dead trees lying on the ground, standing dead trees, or dead branches in tree crowns. In forests subject to natural disturbance dynamics, with no use of timber by humans, the proportion of dead wood is stable in relation to the lifespan and spreading ability of reductive species (Stokland 2001; Rouvinen and Kouki 2002). That relative predictability and abundance of deadwood habitats provides suitable conditions for the development of a variety of reductive communities through allocation of resources and specialization in their use (Junninen 2007). During the decomposition process, the reducers change the structure, moisture content and chemistry of the already decaying trees and thus create new niches for the next saproxylic species. The diversity of decomposition paths also allows the succession of various fungal species, thus contributing to the diversity of microhabitats in tree trunks at advanced stages of decomposition (Renvall 1995).

2.3.2 The Białowieża Forest as an area of the most significant and important natural habitats for in-situ biodiversity conservation (Criterion X)

The Białowieża Forest is the last lowland area in Europe where the largest land mammal of our continent survived in the wild until the beginning of the 20th century. Currently, as a result of a long-term process of restitution of the species in the Białowieża Forest, the area is populated by one of the largest free roaming herds of European bison in the world, with 870 animals (as of March 2025, only in the Polish part of the Forest). A distinctive feature of this complex is the high biodiversity and the large number of species typical of forests and relics of primary forests. There is a long list of bird species which are of special interest to scientists. It is dominated by the species whose occurrence

is determined by the presence of dead trees in the forest. Those are mainly the white-backed woodpecker, the Eurasian three-toed woodpecker and flycatchers. Long-term studies of woodpecker presence in the Forest have shown that the highest densities are recorded in the strict protection area of the Białowieża National Park, which has a positive correlation to the amount of dead wood. Studies have also shown a fairly high density of white-backed and three-toed woodpeckers within the Site.

The results of long-term ornithological observations conducted within the strict protection area differ significantly from those of other forest complexes subject to human interference, but are consistent with the results obtained in tropical zone forests. The main features of the park's avifauna are the high diversity of species, low densities and high predator pressure. Those are the features of primary forests, regardless of climate zone, and can be used as indicators of forest maturity and the absence of human disturbance (Wesołowski et al. 2006).

Despite the relatively good recognition of biodiversity, new species of fungi and invertebrates are discovered almost every year. Many systematic groups are well recognized, while others are still waiting for a synthetical study. This abundance is evidence of the extraordinary importance of the Białowieża Forest as a genetic reservoir of endangered species. The diversity of size and age, along with the presence of very old trees and the presence of dead wood (standing or fallen) in various stages of decomposition distributed throughout the Forest, creates the conditions for the continued occurrence of saproxylic species. Particularly noteworthy are the insects associated with dying and dead trees, especially wilderness relics. This is because the Forest is a refuge of relict forest entomofauna in the European lowlands. For many species, it is the only or one of the few locations in Central Europe (Gutowski and Jaroszewicz 2004).

In terms of fungi, the Białowieża Forest is the most valuable forest area in the northern hemisphere (Niemelä 2010). In boreal and boreo-nemoral forests, polyporoid fungi are the most important dead tree reducers (Renvall 1995). The number of polyporoid fungi species in the Forest is 210 (Karasiński and Wołkowycki 2015), while the total European list includes 394 species. This means that the Forest is home to more than 50% of polyporoid fungi from all over Europe, while simultaneously accounting for 90% of the known taxa of that group from Poland (Kujawa et al. 2016). However, the list is not yet closed and research is still being conducted on some of the species. It is also worth mentioning that from time to time, species new to science are discovered in this small area – for example, *Dentipratulum bialoviesense* (Domański 1965), *Aurantiporus priscus* (Niemelä et al. 2012), *Aporpium macroporum* (Miettinen et al. 2012).

2.3.3 Integrity of the Białowieża Forest

The low degree of fragmentation and sectioning of borders, as well as the high proportion of natural forests with multi-layered and age-diverse stands, make the Białowieża Forest home to relict species. The exceptional preservation status, the numerous monument-sized trees, the low proportion of invasive species, the specific geographic and biogeographic location together with the diversity and abundance of wildlife and the presence of the European bison create a unique ecosystem (Faliński 1986). It is formed by a mosaic of forest and non-forest habitats interconnected by a river system. The valleys of the rivers Narew, Narewka, Leśna, Świsłocz, Roś, Jasiołda and their tributaries integrate the entire area, offering natural migration corridors for animals, but also for seeds and spores

transported by the waters of those rivers. They are used not only by mammals such as elk, beaver, otter, but also by representatives of other groups. They serve as migration routes for waterbirds. The integrity of the entire area of the Forest is well illustrated by the distribution of large mammals – the European bison, the lynx and the wolf. The territories of large carnivores studied with the use of telemetry show that those animals need large spaces, and that the administrative borders of protected areas do not limit their territories (Schmidt et al. 1997, Jędrzejewski et al. 2001). The integrity of the Białowieża Forest is also emphasized by the results of observations of habitat use by the European bison. Climate change, in particular changes in temperatures and precipitation distribution, affect the use of individual types of forest habitats by the European bison. In dry years, the animals are more often spotted in alder forests, while in wet years the use of coniferous forest sites increases (Daleszczyk et al. 2006).

The main features evidencing the integrity and the primary character of the *Site* are:

- the presence of representative ecosystems and forest communities, typical of this part of Europe,
- natural composition and distribution of species,
- complex tree stand structures (complex vertical structure and mosaic arrangement), consistent with developmental stages,
- variety of tree sizes and ages (presence of very old trees),
- presence of dead wood (standing or fallen) in various stages of decomposition.

3. Threats and barriers

3.1 Threats

Threats are understood as factors which may cause adverse changes in the physical, chemical or biological characteristics of resources, formations and components of protected nature, landscape values and the course of natural processes, resulting from natural causes or from human activity. They include factors the source of which is within the Site (internal threats) and in its surroundings (external threats), as well as existing and potential threats¹¹.

The remaining key challenge is the identification of the main factors posing a threat to Białowieża Forest ecosystems, given their interconnectedness. Those threats often reinforce one another, and sometimes one follows directly from the other. As part of the analyses conducted, the most significant sources of threats have been identified and their consequences determined. Climate change and human activity, which may function in synergy, have been identified as the most important. Accordingly, a category of threats arising from their joint impact has also been distinguished. A detailed summary of the identified threats is presented in Table 4.

It should be emphasized that some of the effects are the result of the complex interaction of various types of threats. Examples include habitat fragmentation, caused both by human activity, such as road construction, the barrier on the Polish-Belarusian border, and logging (Mikusiński et al., 2018), and by deteriorating hydrological conditions, including declining groundwater levels (Grygoruk, 2022).

An important threat to the natural value of the Białowieża Forest World Heritage Site, which needs to be discussed further, is the border barrier between Poland and Belarus. In order to assess its impact, the Institute of Environmental Protection – National Research Institute commissioned an expert report from the Mammal Research Institute at the Polish Academy of Sciences (IBS PAN). Analysed were data on the distribution of selected mammal species in the context of the barrier's location and the results of an inventory of invasive plants in the border zone. Considered was also the impact of the barrier on the genetic variability of selected mammal species. The analysis showed that the barrier has a noticeable impact on the distribution of mammals, their migrations and the presence of invasive plants in the Białowieża Forest. This phenomenon includes changes in the distribution of bison and deer, as well as the increased presence of foxes, raccoon dogs and domestic cats near the border. The intensification of small predator activity near the border zone is probably related to the presence of military outposts, being a source of food waste. This could potentially promote the spread of diseases transmitted by wild and domestic mammals. It can also be assumed that the barrier will significantly exacerbate the isolation of the lynx population in the Białowieża Forest, resulting in a further decline in genetic variability and an increased risk to its survival. Detailed information on the impact of the barrier can be found in IOŚ-PIB resources.

It should be emphasized that on the Belarusian side of the border there is also a Belarusian border protection system (the so-called sistema), the construction of which began in the 1980s. It is an

¹¹ Definition based on the Nature Conservation Act, taking into account the approach expressed in the UNESCO Operational Guidelines

uninterrupted system of securities along the border with Poland of about 365 kilometres in length. The main part of the system is a technical barrier about 25 meters wide, consisting of several fences (including barbed wire) and a strip of ploughed land. In recent years, damages to the sistema have been repaired with razor wire (concertina). The expert report on the impact of the barrier, prepared by IBS PAN, focuses on the border fence located on the Polish side.

The complexity of all impacts of the threats shows that an integrated approach to their management within the Site is required. In response to the identified problems, a set of measures has been developed (chapter 5.1) to reduce their negative impact and to ensure the best possible protection of the Property. A detailed summary of specific measures leading to minimization of the negative impact of a given threat is presented in the matrix enclosed to the *Plan* (Annex 4).

Table 4. Threats to the Białowieża Forest

Factors	Threats	Results
Climate change	Rate of increase in global temperature	Changes in the phenology of species (e.g., changes in the timing of germination, flowering, fruiting, leaf shedding in plants), extension of the growing season, changes in the development cycle of insects, in breeding and migration periods of birds
		Changes in the ranges of species forming communities of organisms, which can lead to the remodelling of ecosystems and disrupt their functioning
		Changes in soil dynamics associated with increasing soil temperature and lack of frost in deeper soil layers
		Increasing effect of eutrophication of habitats (related to the deposition of nutrients from the atmosphere, especially nitrogen)
		Increasing likelihood of mass occurrence of pathogenic organisms, including previously unknown ones, as well as folivore and cambivore organisms which attack plants
	Droughts and changes in snow cover	Systematic decrease of groundwater levels
		Drying up of small water reservoirs and watercourses
		Reduction in the availability of drinking water sources for animals
		Threat to reproductive success of species associated with aquatic ecosystems (e.g., dragonflies, amphibians)
		Water deficits during the growing season
		Decrease in the area occupied by some tree species, and thus the threat to organisms associated with those tree species
		Depletion of water resources, including a decrease of groundwater levels, leading to progressive drainage of habitats and an increase in their fertility (especially hydrogenic habitats) due to the acceleration in decomposition processes of organic matter
		Extinction and disappearance of peatlands
		Decreasing area of hydrogenic forest habitats and the associated organisms
		Mineralization of soils leading to the loss of organic matter and soil degradation
		Increase in the vulnerability of ecosystems to abiotic, biotic and anthropogenic factors which may disrupt natural adaptation processes
	Extreme weather conditions related to	Increased frequency and area of windthrows and windsnaps, leading to a disruption in the forest life

Factors	Threats	Results
	intense precipitation and strong winds	cycle
Human activity	Fragmentation and isolation of habitats and populations	Expansion of alien species (anthropophytes) in open and sunny areas deprived of trees as a result of logging
		Disruption of migration of large mammals and gene flow between populations as a result of the construction of a barrier on the Polish-Belarusian border
		Isolation of old-growth forests and the associated relict insect species (e.g., <i>Pytho kolwensis</i>)
		Disturbance of ecosystems, having a negative effect on the reproductive success of species; decline in the population size of species; local extinction of species
		Disappearance of habitats and species such as black stork (<i>Ciconia nigra</i>), lesser spotted eagle (<i>Aquila pomarina</i>), boreal owl (<i>Aegolius funereus</i>), lynx (<i>Lynx lynx</i>), scarce fritillary (<i>Euphydryas maturna</i>), <i>Phyto kolwensis</i>
	Logging and removal of dead trees	Changes in the landscape structure and the functioning of ecosystems at the landscape level
		Negative impact on species and habitats outside the area of forest use (increased fragmentation of ecosystems, edge effect causing withdrawal of species characteristic of the forest interior)
		Reduction in the density of old trees (veteran trees) in stands as a result of the disruption in the demographic structure of their populations
		Rejuvenation of forest stands, reduced availability of dead wood and removal of trees rich in microhabitats poses a threat to the diversity of fungi, especially polypores and fungi living on wood
		Change in the species composition of future tree stands as a result of their artificial regeneration (increase in the proportion of economically desirable species at the expense of species which are not economically important)
		Changes in microclimatic conditions of habitats
		Devastation of the soil and organisms living in the soil, destruction of the undergrowth and trees, killing of invertebrates and small vertebrates as a result of the use of heavy equipment
		Destruction of bird habitats, e.g.: white-backed woodpecker (<i>Dendrocopos leucotos</i>), Eurasian three-toed woodpecker (<i>Picoides tridactylus</i>), Eurasian pygmy owl (<i>Glaucidium passerinum</i>), boreal owl (<i>Aegolius funereus</i>) as a result of removal of dead trees
		Deprivation of habitats for saproxylic insects due to removal of dead wood
		Disruption in the functioning of plant symbionts (e.g., ectomycorrhizal fungi) and saprotrophic organisms sensitive to forest management – threatening the sustainability of forest ecosystems

Factors	Threats	Results
	Unsustainable tourism development	Pressure of tourist infrastructure (hotels, facilities generating excessive noise and light pollution), increased road traffic (noise; air, soil and water pollution), organization of mass events
	Development of buildings in the buffer zone	Increasing changes in the spatial structure of the landscape and an increase in mosaic landscapes
		Reduction of the area of habitats, degradation of soils and ecosystems
		Degradation of the landscape as a result of the construction of buildings architecturally alien to the Białowieża Forest region
	Unauthorized use of resources	Disturbance of habitat stability and reduction of populations as a result of poaching, illegal harvesting of protected species of plants, animals, fungi, as well as motor vehicle traffic and unsustainable use of groundwater resources
		Disturbance in the functioning of ecosystems, in particular aquatic and water-dependent ones, as a result of maintenance works on watercourses and all measures aimed at reduction of natural periodic flooding of river valleys by accelerating runoff from the catchment area (including straightening of watercourse beds, drainage and runoff systems)
	Interference and disturbance caused by human presence	Disturbance of the balance of ecosystems as a result of penetration, littering, destruction, trampling, vandalism, as well as scaring of species
	Emissions of pollutants	Change in the functioning of terrestrial and aquatic ecosystems as a result of eutrophication caused by the discharge of untreated wastewater, the discharge of rainwater from streets directly into watercourses, and as due to atmospheric air pollution
	Migration crisis	Increase in the use of the border zone related to the activity of agencies as well as migrants and the associated increase in littering, destruction, trampling, vandalism, as well as scaring of species
		Reduction in tourism and interest in the Białowieża Forest Site
	Barrier on the Polish-Belarusian border	Isolation of populations and blockage of migrations of large animals, and consequently reduction of the abundance, gene flow and genetic variability of populations of rare species
		Forced changes in the directions and ranges of movement of large mammals
		Increased use of the border zone by medium-sized predators as a potential source of spreading of infectious diseases among animals and humans
		Spread of invasive plant species along the border zone
		Noise and light pollution related to the barrier and the activity of agencies within the area of the Site
Climate change / Human activity	Rate of increase in global temperature / Drought and snow cover changes /	Increased fire risk

Factors	Threats	Results
	Human activity	
	Spread of alien species	Displacement of native plant and animal species by foreign species, preventing the multiplication and spread of native species
		Dwining of native species, e.g.: European ash (<i>Fraxinus excelsior</i>) due to infection by an invasive fungus (<i>Hymenoscyphus fraxineus</i>), elm due to infection by an invasive fungus (<i>Ceratocystis ulmi</i>)
		Extinction of native species due to hybridization with foreign species
		Disturbance of physical, chemical and biological soil properties by alien species (goldenrod species <i>Solidago spp.</i> , northern red oak <i>Quercus rubra</i>)
		Changes in the circulation of chemical elements in the ecosystem and in its hydrological characteristics
		Disruption of food webs – impact on herbivores, organisms living in the near-surface part of soil (edaphon), pollinator community
		Increasing pressure on native species due to increasing populations of alien and invasive animal species such as American mink (<i>Neogale vison</i>) and raccoon dog (<i>Nyctereutes</i>), and the emergence of new species (raccoon <i>Procyon lotor</i> , golden jackal <i>Canis aureus</i>)
		Decreased health of the European bison population and other animal species as a result of the spread of foreign parasites and pathogens

Of key importance is also the fact that individual threats vary in the degree of their impact on the Site's OUV. To assess the impact of the threats, the methodology recommended by UNESCO was applied. It should be noted that for some of them, e.g., threats resulting from climate change, it is difficult to minimize them locally, since they have a large-scale impact. The results of the analysis, compiled by a team of experts based on the latest data and knowledge, are presented in (Fig. 6)¹².

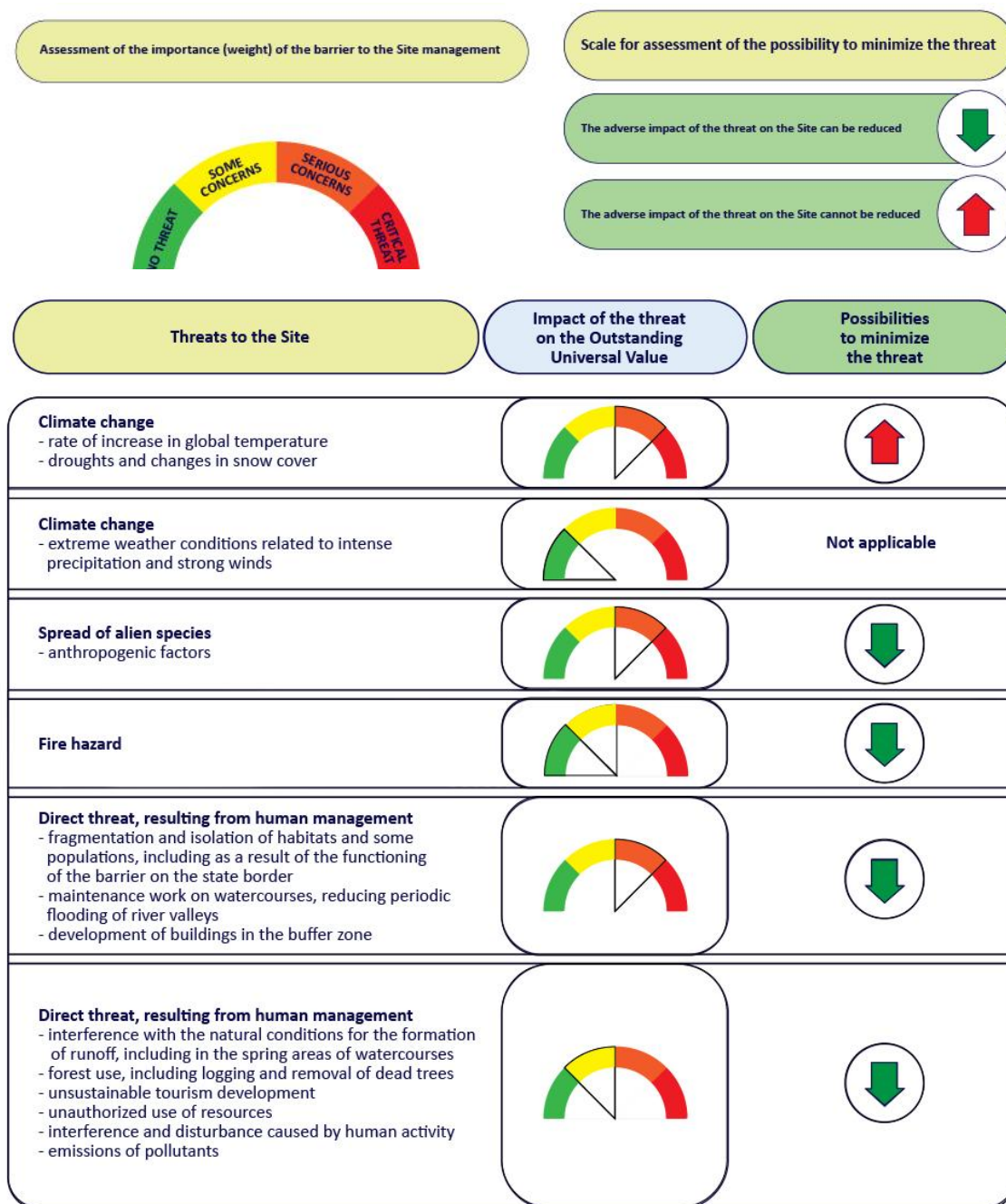


Fig. 6. Assessment of the impact of threats on the Outstanding Universal Value

¹² The assessment is based on literature, including IUCN assessments (<https://worldheritageoutlook.iucn.org/>), expert reports prepared for the purposes of the *Plan* (listed in Annex 2), and takes into account results of a survey conducted among scientists in October 2022.

3.2 Barriers

Management barriers are elements of the management system which make it difficult or impossible to achieve the objective of preserving the Site. They refer to the organizational framework, (legislative and financial) implementation instruments, cooperation with stakeholders, as well as the legal and political environment. Management barriers are systemic conditions affecting the effectiveness of legal protection and the transparency, consistency and comprehensiveness of the management of the World Heritage Site¹³.

Four categories of barriers have been identified:

- in the political and legal environment,
- organizational,
- financial,
- related to stakeholders and users of the Białowieża Forest.

A particular barrier, both political-legal and physical, is the barrier built on the border between Poland and Belarus, which has significantly changed the former character of the Białowieża Forest as a cross-border area. It should be mentioned that the barrier not only marks the border between the two countries, but also serves as the external border of the European Union, which is of key importance for the management of the Site and the determination of directions of local development.

Similarly to the threats, a set of measures has been developed in response to the identified barriers (chapter 5.1). As for the threats, a detailed matrix has been developed, indicating specific measures to help reduce the negative consequences of specific barriers. It allows to easily identify the best ways to minimize the impact of each identified barrier (Annex 5). A detailed summary of the identified barriers is presented below (table 5). An assessment of their impact on the OUV is presented in the following Fig. 7. The same methodology has been used here as for the threats.

¹³ Definition adopted for the purposes of the development of the *Plan*, taking into account the approach expressed in the UNESCO Operational Guidelines and referring to the IUCN approach – criteria for the evaluation of World Heritage Sites.

Table 5. Management barriers for the Białowieża Forest

Category	Description	Barriers
In the political and legal environment	Geopolitical situation	Cessation of international cooperation with Belarus
		Activities of state authorities in the border zone related to the crisis on the Polish-Belarusian border
	Insufficient consideration of the UNESCO World Heritage Site status in legislation and decision-making	Lack of national legislation on UNESCO World Heritage Sites, including in the context of development and spatial policy
		Bypassing of regulations concerning the World Heritage status in the management of the area of the Site
Organizational	Lack of a uniform system (including structure) to manage the Site	Slow or incomplete implementation of some of the UNESCO Committee's decisions and recommendations concerning the management of the Site
		Lack of a systemic approach to the Site management to guarantee consistency and continuity of preservation of the Outstanding Universal Value in a long-term perspective
		Ad hoc decisions which affect the Site and are made without sufficient justification based on current knowledge
		Lack of established (in a participatory manner) objectives and measures to preserve the Outstanding Universal Value of the Site
		Lack of a management structure for the Site, including clearly defined roles of individual entities
		Lack of formal rules of participation of local residents in the process of the Site management, e.g. the manner of appointing representatives of the local community to participate in the Site management
		Lack of effective coordination between the three bodies responsible for the management of the area - the Belovezhskaya Pushcha National Park in Belarus and the Białowieża National Park and the forest administration in Poland
		Lack of a consistent monitoring program for the Site to comprehensively assess the effectiveness of the management
		Functioning of different management systems within the area of the Site
		Lack of consistency in the objectives and measures specified in strategic and planning documents in terms of nature conservation, forest management, socio-economic and spatial development applicable to the Site and the buffer zone
		Insufficient consideration of the UNESCO World Heritage status in strategic and planning documents in the functional environment of the Białowieża Forest which affect the preservation of the universal value
	Insufficient coordination of development planning systems	Lack of planning coordination of regional and local development, affecting the preservation of the outstanding universal value of the Site
		Low degree of consideration of the Site and its value in the development of local community
		Lack of a consistent approach to local development based on the benefits resulting from the presence of the UNESCO World Heritage Site

Category	Description	Barriers
		Lack of a common, consistent strategy and measures for the development of the Białowieża region and municipalities, of which Białowieża Forest is an important element
Financial	Lack of a (special) fund for the management of the Site, education and communication, as well as support of the socio-economic development	Lack of proper funding for the management of the Site, blocking the development of institutionalization, coordination of conservation measures and other activities within the area of the Site – implemented in accordance with its objectives
		Lack of funds for consistent interpretation and promotion of the Site and education about the need to preserve its outstanding universal value
		Lack of a fund to serve the local community and support cooperation of stakeholders for the purposes of preservation of the Site
Related to stakeholders and users of the Białowieża Forest	Ineffective communication of information about the objectives of protecting the World Heritage values	Unfamiliarity or inconsistent interpretation of the objectives of protecting the Outstanding Universal Value of the Site
		Lack of transparency in the debate and actions taken to protect the Site
		Lack of a long-term communication and information strategy about the Białowieża Forest as a natural heritage of humanity
		Insufficient scale of information measures concerning the Site, using specific communication channels tailored to the needs of various stakeholders and users
		Lack of a common approach to the terminology used in the context of the objectives of the Site's preservation for present and future generations
	Insufficient and ineffective education about the Site	Insufficient coordination of educational activities carried out by the Site's managers, i.e. State Forests and the Białowieża National Park
		Ineffective education about the Site (adjusted to different age groups and various levels of knowledge about UNESCO World Heritage) as a result of the lack of an entity/organization to offer profiled education concerning the Site
	Gaps in knowledge among managers and users regarding the objectives and values of the Site	Ineffective transfer of knowledge and information about the World Heritage and promotional and information measures insufficiently tailored to the needs of different user groups of the Białowieża Forest
		Lack of encouragement and support for various organizations and institutions (including local government units) within the scope of activities to raise awareness and bridge knowledge gaps
		Lack of an information campaign including trainings, workshops, lectures on the possibilities of using the Site (its recognizability and brand) in development activities
	Limited cooperation between various interest groups	Low level of social capital (also diagnosed in Poland in general)
		"Silo" approach to the management of local development, culture of competition instead of cooperation
		Lack of a forum for dialogue between individual interest groups, often representing conflicting approaches, lack of a platform for finding compromise solutions and deliberations

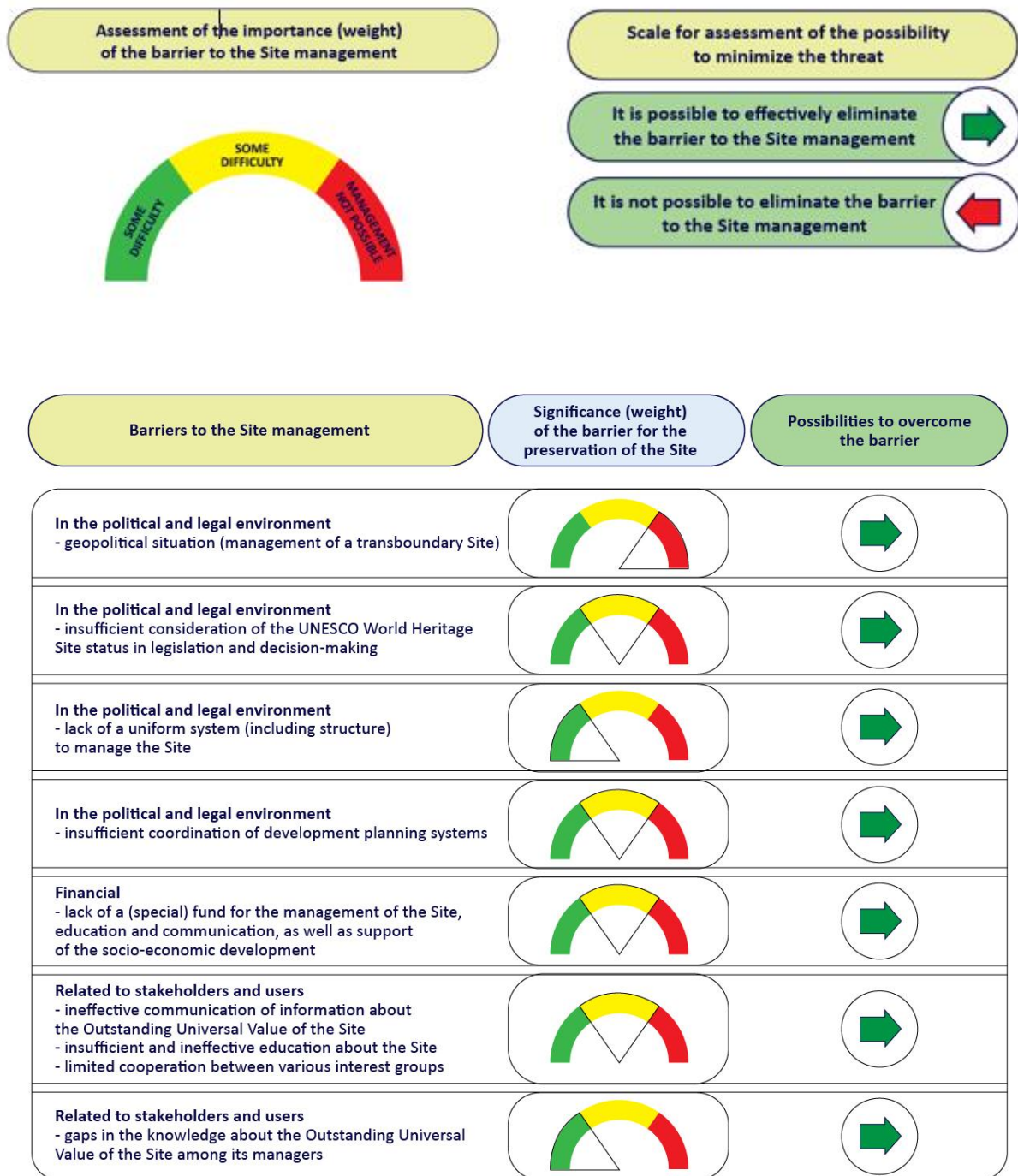


Fig. 7. Assessment of the importance (weight) of the barrier to the Site management

4. Management strategy

4.1 Adaptive management as a way to achieve the objectives

During the work on the plan, special attention has been given to adaptive management as an effective tool for integrating scientific expertise with the overarching objectives of protection of the Site and its Outstanding Universal Value. Due to the nature of the document, it was decided to use the approach based on the understanding of the concept of adaptive management according to the the guidelines for the management of Natura 2000 sites developed by the European Commission (Guidelines on Climate Change. Dealing with the impact of climate change. On the management of the Natura 2000 Network of areas of high biodiversity value., 2013). Adaptive management at the Białowieża Forest Site should be based on a process of continuous learning and adaptation of measures to changing environmental, political or geopolitical conditions. The process of optimal management decision-making should be based on monitoring of the achievement of specific objectives and progress in their implementation, and should be adjusted according to the current/new knowledge. Such an approach aims to continuously improve the management of the Site in order to contribute to the mitigation of the existing and emerging threats and to better protect the OUV of the Site.

The challenge related to the adaptive management approach is finding the right balance between the acquisition of knowledge for better management in the future and the achievement of the best short-term results based on current knowledge (Allan and Stankey, 2009)

In order to fully use and continuously enrich the knowledge presented in adaptive management, collaboration with groups outside the management organization itself is often required (Charles, 2007). That is why an integral element of this approach is the involvement of stakeholders, which allows to present and discuss the consequences of different management options, among others, for species and ecosystems, taking into account their impact on ecosystem services. Early, transparent and active involvement of stakeholders increases the acceptance for adaptation measures, even if they involve the introduction of restrictions, such as changes in the active protection, hunting or the use of non-forest land. This approach is confirmed by the example of stakeholder involvement in the adaptive management of forests affected by introduced deer in New Zealand. Analysis of this process shows that stakeholder participation in the earlier stages of adaptive management can lead to increased success in the "action" phase, while the participatory aspects of adaptive management are often considered separately or at best as an "addition" when measures are introduced (Jacobson, 2007).

The basis of management is in-depth understanding of the processes occurring at the Site. It is possible only if adequate monitoring of the changes taking place in the Białowieża Forest is planned. Key elements of this approach include the identification of major threats, the alignment of conservation objectives and the dedicated measures, the development of assumptions for consistent monitoring and the implementation of its results. Within the framework of adaptive management, monitoring plays a key role as a tool for the systematic collection and analysis of data on the condition of the site, which allows for ongoing monitoring of the effectiveness of the implemented interventions. New scientific information, gained from both scientific research and monitoring

activities, allows to identify new threats and to assess current natural tendencies. As indicated by the theoretical assumptions presented by Hollings (1978) and further developed by Walters and Holling (1990), the acquired data provide the foundation for the development and documentation of decisions to adjust co-management recommendations, which enables iterative improvement of the protection strategy for the Site. The integration of monitoring results with new scientific research is therefore essential to effectively mitigate the existing and emerging consequences of negative processes, contributing to better protection of the site's OUV and to maintenance of long-term balance of in the functioning of the ecosystem.

The above findings are also supported by an excerpt from the book *Adaptive Environmental Management* (Allan and Stankey, 2009), in which the authors emphasize the importance of monitoring in adaptive management: Monitoring is essential to adapt management decisions in the face of uncertainty, providing critical data for timely adjustments.

Systematic collection and analysis of monitoring data are indispensable for making accurate decisions, allowing to quickly respond to changing environmental conditions and to adjust conservation strategies in reaction to emerging challenges. As a result, this approach allows to improve the management processes and provides the basis for building flexible nature conservation systems which can effectively respond to dynamic changes and unforeseen threats.

The *Management Plan* includes recommendations for the development of a long-term monitoring program which will allow a better understanding of the Site and the interactions taking place within it. In addition, an evaluation system has been developed for the implementation of the *Plan's* objective, which will allow to verify the extent to which the collected monitoring data are used and to assess the effectiveness of the introduced measures.

4.2 Vision

The Białowieża Forest, stretching on both sides of the Polish-Belarusian border, is a forest complex representative of the North European Plain, with extensive fragments of natural forest of primeval character. Ecological processes occur naturally here. A multi-species old-growth forest, as found nowhere else, rich in dead trees, both standing and lying, grows here. There is an unparalleled variety of species, especially fungi and saproxylic invertebrates. The Białowieża Forest is home to the world's largest free-living population of the European bison, a species saved from extinction and a symbol of the Forest. Due to its uniqueness, the Białowieża Forest has been inscribed on the World Heritage List. It is assumed that the implementation of the *Management Plan* should serve the vision of preserving the world natural heritage of the Białowieża Forest for future generations.

In 2050, the Białowieża Forest is:

- an area where ecological processes occur naturally and constitute its Outstanding Universal Value,
- an area where natural habitats which ensure the preservation of biodiversity are protected,
- an integral Site, the integrity of which as a whole is maintained thanks to the presence of untransformed, vast forest ecosystems, preservation of their biodiversity and securing of undisturbed ecological processes,

- an important place for humanity, present and future generations, who know and understand the tangible and intangible value of the Site and its integrity,
- motivation for the cooperation between international, national and local actors for the protection of the natural heritage of humanity,
- an inspiration for actions for sustainable development of the community living in the Białowieża Forest region, with a sense of responsibility for the Site,
- an element of identity and local ties, based on the natural, cultural and historical values of the Białowieża Forest,
- a place of natural and cultural education and dissemination of knowledge about World Heritage sites,
- a Site enjoying global, national, regional and local recognition.

4.3 Objectives

To achieve the vision of the Białowieża Forest by 2050, eight objectives have been adopted. Each element of the vision corresponds to one objective. The first three objectives refer to the criteria for the Białowieża Forest's inscription on the World Heritage List, while the remaining objectives refer to the sustainable use of the Site.

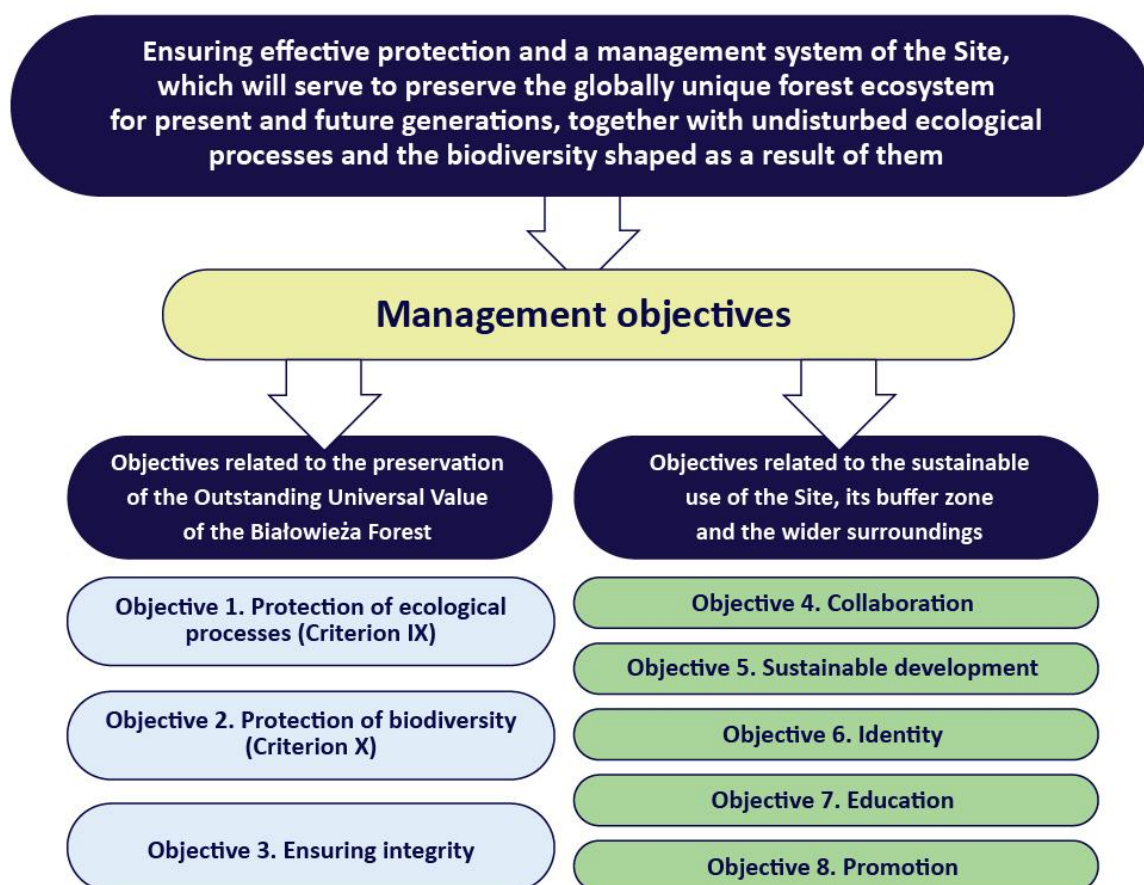


Fig. 8. Site Management objectives

The objectives have been identified based on current knowledge about the Outstanding Universal Value and the need to protect it, and developed in cooperation with stakeholders during workshops. The objectives address the threats which adversely affect the Outstanding Universal Value of the Białowieża Forest and the barriers which hinder or prevent effective management of the Site.

The management objectives are as follows:

Objective 1. Preservation of undisturbed ecological processes
Objective 2. Protection of biodiversity at all levels (ecosystem, species and genetic level) and its essential habitats
Objective 3. Preservation of the integrity of the Site as a whole
Objective 4. Promotion of and support for the cooperation between of international, national and local entities
Objective 5. Creation of conditions for sustainable development of the Białowieża Forest municipalities
Objective 6. Strengthening of the identity and pride of local communities on the basis of knowledge of the natural, cultural and historical values of the Białowieża Forest
Objective 7. Provision of environmental and cultural education and promotion of the World Heritage Site
Objective 8. Use of the outstanding value of the World Heritage Site to promote the Białowieża Forest region

4.4 Results

The Białowieża Forest Site is managed effectively

The Białowieża Forest Site has a *Plan* with a defined long-term vision and objectives for its realization, as well as realistic measures, with funding provided for their implementation. A clear organizational structure of the management has been established, including the entity responsible for coordinating the implementation of the *Plan*. Legal tools, regulations as well as strategic and planning instruments are consistent and serve to protect the Outstanding Universal Value of the Białowieża Forest. The entities involved in the management know and accept their roles. The rules of communication and cooperation are understood and accepted by all stakeholders. Recognized is the joint effort to protect the Outstanding Universal Value of the Białowieża Forest for present and future generations. An adaptive management approach is used. The impact of the introduced measures is monitored, and in the next stage, the measures are evaluated based on the newly acquired knowledge. The whole process involves continuous learning and understanding of the processes taking place, so as to effectively manage the Site and protect its Outstanding Universal Value.

The Białowieża Forest Site is properly protected

Within the area of the Site, in the forest habitats of zone 1, 2, 3 and 4c (see chapter 6.4) ecological and biological processes are undisturbed. The populations of species which determine the OUV of the Białowieża Forest are shaped by natural factors. In some cases, human activity is also important.

The Białowieża Forest Site is interpreted and recognized in Poland and throughout the world

Scientific research is conducted in the area of the Białowieża Forest to best understand and describe the Property. The knowledge is still being broadened. Research results are published and disseminated in Poland and abroad. There are a databases of data and information about the Białowieża Forest as well as forums for exchange of knowledge about the Białowieża Forest. Systematic public surveys are conducted on the knowledge of the Site, which prove that the World Heritage Site is known in various communities in Poland and abroad.

Future generations can enjoy the Property

Through efficient management of the Property, the Outstanding Universal Value is being preserved for future generations. Managers and stakeholders understand the principle of intergenerational justice, and know that preservation of the Property is crucial not only for the continuation of ecological processes and biodiversity, but also for meeting the needs of future generations and building their local identity and knowledge of the history of the region.

Thanks to the Property, the present generation is broadening its knowledge, shaping its attitudes and behaviours

The Białowieża Forest Site is recognized in Poland and throughout the world. Knowledge about the Site is disseminated, and people from different communities understand and appreciate the Outstanding Universal Value of the Białowieża Forest. Visitors to the Białowieża Forest, thanks to the experience of its Outstanding Universal Value and the various forms of education offered at the Site, understand the need to care for the Property and nature in Poland and abroad. Thanks to the knowledge and experience, people become involved in the protection of the Białowieża Forest and nature conservation and are able to change their behaviours.

Local community benefits from the natural environment thanks to the Property

The high-quality resources of the natural environment of the Białowieża Forest Site are of unique value to the local community. The local community benefits from numerous ecosystem services provided by the Białowieża Forest. The Property provides a variety of services for the local community. Considered most important are the services related to intangible contribution to people's lives i.e. providing a high quality of life, offering mental and physical experiences, and building the local identity.

Local community develops in harmony with the Property

Understanding the Outstanding Universal Value of the Property and the need to preserve it for future generations, the local community includes the Property in its development processes. The development directions of the Białowieża Forest municipalities are sustainable. A high quality of life (understood also as access to public services and environmental infrastructure) is easier to achieve

with the funding assigned for the region. Local development is possible thanks to efficient territorial marketing, cooperation of local governments and other stakeholders within the scope of promotion. The Białowieża Forest brand is recognized nationally and internationally, and residents of the region identify with it.

5. Directions and measures

5.1 Directions and measures developed in a participatory manner

As a UNESCO World Heritage Site, the Białowieża Forest requires a sustainable management approach, which takes into account both the protection of its OUV and dynamically changing challenges such as climate change, tourism pressure, or habitat fragmentation. A key tool in this context is adaptive management, which allows flexible planning of measures, their regular monitoring and making adjustments in response to new information and circumstances. The proposed measures, such as the removal of redundant infrastructure and the renaturalization of aquatic ecosystems, are consistent with this approach. Thanks to systematic monitoring and analysis of the effectiveness of those measures it is possible to gradually improve the Forest's conservation strategy, which not only increases the efficiency of operations but also allows for better management of uncertainties and better cooperation between institutions responsible for protecting this unique place.

The Białowieża Forest is characterized by a number of attributes which together define its unique and universal value and influence the definition of directions and measures. Selected attributes which guided the determination of directions and measures are listed below:

- **Biodiversity and unique ecosystems:** The Białowieża Forest is one of the last fragments of primeval forest, where natural ecological processes have been preserved. The area is home to rare species of plants, fungi and animals, which makes it extremely valuable in biological and genetic terms. The natural structure of the forest, including old trees, dead wood and diverse vegetation layers, supports the functioning of complex trophic networks.
- **Scientific and educational value:** Thanks to the preservation of natural processes and species richness, the Białowieża Forest is a place with a great research potential. Research carried out at the Forest allows a better understanding of ecosystem dynamics, succession processes and the adaptive mechanisms of nature's functioning, which is crucial for global strategies of environment protection.
- **Importance for international nature conservation:** The unique character of the Białowieża Forest has been recognized by the international community, as evidenced by its inscription on the UNESCO World Heritage List. This status emphasizes not only the regional, but also the global importance of the site as a model of natural environment.
- **Ecological integrity and continuity of natural processes:** The site is distinguished by its high ecological integrity – it is a place where natural processes, such as biogeochemical cycles and interactions between species, are not modified by human activity. This continuity is extremely valuable in the context of adaptive management and preservation of biodiversity.
- The measures should be introduced by competent institutions and organizations, in cooperation with the local community and scientific experts. The following are suggestions for selected measures.
- **Cultural and historical heritage:** The site has deep cultural significance, being a place with a long history of interactions between humans and nature. Traditional methods and local legends and stories add an extra value to the Białowieża Forest, making it not only a natural reservoir, but also a cultural treasure of the region.

The adopted directions and measures, as presented below, have been developed in a participatory manner, and each of them has been analysed in terms of acceptance by various stakeholders (chapter 1.2, 1.3). The directions are closely linked to the determined measures, allowing for the effective implementation of the overarching objectives. The adopted approach makes it possible to both reduce the identified threats and barriers to the preservation of the Site's integrity and achieve the planned results.

Effective implementation of measures requires cooperation between different levels of administration (national, regional, local), NGOs, scientists and the local community. Coordination of the measures should be overseen by competent ministries, such as the Ministry competent for the environment, and the implementation should be supported by nature conservation and research institutions. Belarusian institutions are named as potential partners for some of the measures. Given the transboundary nature of the World Heritage Site, it is important to remain open to future cooperation as soon as political and social conditions allow for it to be conducted safely and constructively.

Objective 1. Preservation of undisturbed ecological processes

The objective is to preserve the natural course of processes in ecosystems in the largest possible area of the Białowieża Forest Site. It refers to criterion IX, according to which the Białowieża Forest's inscription on the World Heritage List is based on the occurrence of exceptional ongoing ecological processes important in the evolution and development of terrestrial ecosystems as well as animal and plant communities. The term ecological processes includes both physical and biological processes which affect the distribution and condition of ecosystems and contribute to the preservation of their integrity, biodiversity and evolutionary potential.

The tool for achieving the objective is **zoning** with designated areas allocated for the protection of natural processes.

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,
- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border,
- **climate change and human activity:**
 - fire hazard,

- spread of alien species.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **in the political and legal environment, including:**
 - geopolitical situation,
 - insufficient consideration of the UNESCO World Heritage Site status in legislation and decision-making,
- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 1.1.** Ensuring passive protection of ecological processes within the Białowieża Forest Site.
- **Measure direction 1.2.** Conducting scientific research at the Białowieża Forest Site.
- **Measure direction 1.3.** Monitoring of abiotic and biotic factors affecting ecological processes.
- **Measure direction 1.4.** Considering climate change and its effects in decision-making processes concerning the Site.

Measure direction 1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site.

Measure 1.1.1 Ensuring passive protection of ecological processes in the Site's zones

Description of the measure	
<ul style="list-style-type: none"> – Undisturbed ecological processes are the basis of the Outstanding Universal Value of the Białowieża Forest Site, so human interference in their course should be restricted as much as possible – The extent of human interference with the environment depends on the location (zone) and the rules set out therein as stated in Chapter 6.4 	
Connection to other measure directions	1.2. Conducting scientific research at the Białowieża Forest Site 1.3. Monitoring of abiotic and biotic factors affecting ecological processes 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international

	regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research 3.1. Establishment of a consistent legal system to protect ecological processes and biodiversity within the Site			
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate for Environmental Protection in Białystok Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding UNESCO World Heritage Centre Polish National Commission for UNESCO Belovezhskaya Pushcha National Park (Belarus) Scientific entities NGOs			
Beneficiaries	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding Budget of the Regional Directorate for Environmental Protection in Białystok Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 1.2. Conducting scientific research at the Białowieża Forest Site

Measure 1.2.1 Development of the rules of scientific exploration for the entire area of the Site, conducting and supporting scientific research

Description of the measure

- Development of the Rules of Scientific Exploration within the area of the entire Site, taking into account:
 - restrictions in force in individual zones of the Site
 - continuation of long-term research projects, including monitoring studies within the area of the Site
 - reduction of pressure on the ecosystems of the Forest to the necessary minimum, including collection of natural specimens
- Conducting and supporting scientific research aimed at gaining comprehensive knowledge about elements of nature in the Site area, the phenomena and processes occurring here, as well as the mechanisms of the influence on nature by various forms of human activity or improvement of the methods of active protection and conservation of nature
- Ensuring the process of reviewing research projects by the Scientific and Social Council of the Site or the Scientific Council of the Białowieża National Park, or the Scientific and Social Council

of the Białowieża Forest Promotional Forest Complex (depending on the location of the research) – Striving for cooperation with the Belovezhskaya Pushcha National Park (Belarus)				
Connection to other measure directions	7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Białowieża National Park Białowieża, Browsk, Hajnówka and Bielsk Forest Districts			
Cooperating entities	Chief Inspectorate for Environmental Protection Regional Directorate for Environmental Protection in Białystok Belovezhskaya Pushcha National Park (Belarus) Scientific Council of the Białowieża National Park Scientific and Social Council of the Białowieża Forest Promotional Forest Complex Scientific entities NGOs			
Beneficiaries	Minister competent for the environment State Forests National Forest Holding Scientific community General public			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding Budget of the Regional Directorate for Environmental Protection in Białystok Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 1.3. Monitoring of abiotic and biotic factors affecting the ecological processes

Measure 1.3.1 Monitoring of abiotic and biotic factors

Description of the measure
<ul style="list-style-type: none"> – Development of a program and implementation of monitoring for the Białowieża Forest Site, taking into account: <ul style="list-style-type: none"> • abiotic and biotic elements of the environment, including the Site features - specified in the Declaration of the Outstanding Universal Value • factors affecting ecological processes and biodiversity, including those related to climate change, tourism, and forest management • disturbances in ecological processes and biodiversity leading to deterioration of ecosystems or the condition of populations inhabiting the Białowieża Forest, with particular emphasis on invasive alien species • permanent research plots – Ensuring coordination of monitoring in the Białowieża Forest with broader (national and international) monitoring to avoid duplication of research and measures, also considering the guidelines and methodology guidebooks applicable for the State Environmental Monitoring

<p>– Ensuring a consistent system to collect data and monitoring results, including:</p> <ul style="list-style-type: none"> • creation of a database for the monitoring conducted at the level of the Site and its buffer zone • consideration in monitoring studies conducted at the Site of the rules on collection and transmission of data as approved under the State Environmental Monitoring, • ensuring public access to data resources and monitoring results in accordance with the law 				
Connection to other measure directions	<p>1.2. Conducting scientific research at the Białowieża Forest Site 1.4. Considering climate change and its effects in decision-making processes concerning the Site 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research 3.2. Taking steps to prevent fragmentation and isolation of habitats within the Site</p>			
Entity responsible for the implementation of the measure	<p>Management Plenipotentiary for the Białowieża Forest Site Białowieża National Park Białowieża, Browsk, Hajnówka and Bielsk Forest Districts Regional Directorate for Environmental Protection in Białystok Regional Water Management Authority in Białystok Regional Water Management Authority in Lublin Chief Inspectorate for Environmental Protection</p>			
Cooperating entities	<p>Minister competent for the environment General Directorate for Environmental Protection Belovezhskaya Pushcha National Park (Belarus) Scientific entities NGOs</p>			
Beneficiaries	<p>Minister competent for the environment State Forests National Forest Holding Scientific community General public, including the local community</p>			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	<p>Resources of monitoring institutions Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)</p>			

Measure direction 1.4. Considering climate change and its effects in decision-making processes concerning the Site

Measure 1.4.1 Considering climate change and its effects in decision-making processes concerning the Site

Description of the measure <ul style="list-style-type: none"> – Identification of threats resulting from climate change relevant to habitats and species as well as processes within the area of the Site – Comprehensive analysis of opportunities to counteract the effects of climate change in the long term – Considering climate change and its effects in the planning of measures within the area of the Site, in particular in zone 4 and in the buffer zone 				
Connection to other measure directions	1.2. Conducting scientific research at the Białowieża Forest Site 1.3. Monitoring of abiotic and biotic factors affecting the ecological processes			
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Water Management Authority in Białystok Regional Water Management Authority in Lublin Regional Directorate for Environmental Protection in Białystok Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Regional Directorate of State Forests in Białystok Belovezhskaya Pushcha National Park (Belarus) Scientific entities NGOs			
Beneficiaries	Minister competent for the environment State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding Budget of the Regional Directorate for Environmental Protection in Białystok Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Objective 2. Protection of biodiversity at all levels (ecosystem, species and genetic level) and its essential habitats

The objective is to protect biodiversity at the ecosystem, species, and genetic levels within the area of the Białowieża Forest Site. It refers to criterion X, according to which the basis for the inscription of the Białowieża Forest on the World Heritage List is the presence of the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing

threatened species of outstanding universal value from the point of view of science or conservation. In the implementation of the measures related to this objective, nature conservation plans are of key importance, that is, conservation plans, conservation task plans, as well as conservation tasks referred to in the Nature Conservation Act. Conservation plans are instruments for the implementation of the *Plan*.

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,
- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
- **climate change and human activity:**
 - fire hazard,
 - spread of alien species.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **in the political and legal environment, including:**
 - geopolitical situation,
 - insufficient consideration of the UNESCO World Heritage Site status in legislation and decision-making,
- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 2.1.** Implementation of nature conservation plans established for all conservation forms at the Site.
- **Measure direction 2.2.** Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations.

- **Measure direction 2.3.** Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research.

Measure direction 2.1. Implementation of nature conservation plans established for all conservation forms at the Site

Measure 2.1.1 Implementation of the Białowieża National Park Conservation Plan

Description of the measure				
<ul style="list-style-type: none"> – Implementation of tasks according to the Conservation Plan of the Białowieża National Park, with particular emphasis on tasks related to the management of the European bison population at the Site and in accordance with the established protection regimes, i.e.: <ul style="list-style-type: none"> • strict protection - leaving the area to the forces of nature and abandoning direct human interference • active protection - human intervention is possible in the form of protective treatments aimed at restoration of ecosystems and nature components as close as possible to their natural state or at preserving natural habitats and habitats of plants, animals and fungi; including mowing and shrub removal in meadows in river valleys, mid-forest meadows and areas of former timber yards • landscape protection - preservation of the characteristic features of a given landscape, including the landscape of the Palace Park, the composition of the tree plantings and meadow communities; maintenance cutting of trees and shrubs and mowing of meadows 				
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research			
Entity responsible for the implementation of the measure	Białowieża National Park			
Cooperating entities	Management Plenipotentiary for the Białowieża Forest Site Scientific entities NGOs Belovezhskaya Pushcha National Park (Belarus) Białowieża, Browsk and Hajnówka Forest Districts			
Beneficiaries	Białowieża National Park General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Białowieża National Park, Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure 2.1.2 Implementation of nature conservation plans in the Natura 2000 area Białowieża Forest PLC 200004 (outside the Białowieża National Park)

Description of the measure				
<ul style="list-style-type: none"> – Implementation of the objectives and conservation measures included in the nature conservation plans for the Natura 2000 area – Updating of nature conservation plans in accordance with the latest knowledge and the regulatory schedule – In newly developed conservation plans or conservation task plans, continuation of conservation measures adopted in the current conservation task plan with respect to: <ul style="list-style-type: none"> • maintenance of an undiminished number of tree stands over 100 years old (according to the definition of over-hundred-year-old tree stands adopted in this <i>Plan</i>) • ensuring the presence of dead trees in tree stands in accordance with the requirements of the conservation task plan – In newly developed conservation plans or conservation task plans, considering the impact on natural processes and biodiversity of the restriction of hunting to only invasive alien species 				
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research			
Entity responsible for the implementation of the measure	Regional Directorate for Environmental Protection in Białystok Białowieża, Browsk and Hajnówka Forest Districts			
Cooperating entities	Management Plenipotentiary for the Białowieża Forest Site General Directorate for Environmental Protection Minister competent for the environment Białowieża National Park Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Regional Directorate for Environmental Protection in Białystok National Fund for Environmental Protection and Water Management Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure 2.1.3 Implementation of nature conservation plans in Białowieża Forest reserves

Description of the measure				
<ul style="list-style-type: none"> – Implementation of the objectives and conservation tasks included in the nature conservation plans for reserves – Updating of nature conservation plans in accordance with the latest knowledge and the regulatory schedule – Ensuring the development of nature conservation plans in accordance with applicable regulations 				
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research			
Entity responsible for the implementation of the measure	Regional Directorate for Environmental Protection in Białystok Białowieża, Browsk and Hajnówka Forest Districts			
Cooperating entities	Białowieża National Park Regional Directorate of State Forests in Białystok Minister competent for the environment Management Plenipotentiary for the Białowieża Forest Site Scientific entities NGOs			
Beneficiaries	General Directorate for Environmental Protection General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Regional Directorate for Environmental Protection in Białystok Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations

Measure 2.2.1 Ensuring compatibility of conservation objectives of the Białowieża Forest World Heritage Site for various forms of area and species protection

Description of the measure <ul style="list-style-type: none"> – Evaluation of the validity of the data included in the expert report developed as part of the work on the Site Management Plan entitled „Opracowanie ram dla formułowania celów zarządzania dobrem światowego dziedzictwa” [Development of a framework for the formulation of objectives for the management of the World Heritage property] in the context of possible legal changes since 2022 and within the scope of compatibility of conservation objectives pursued by various entities. – Development of a research project to resolve potential incompatibilities in the protection of individual elements of the Białowieża Forest ecosystem, with particular emphasis on the limitations and opportunities arising from the adopted zoning of the Site. – Analysis and review of newly created management documents in terms of: <ul style="list-style-type: none"> ○ Poland's obligations under international law, European Union law and national law, including ratified international conventions and agreements – Protection of the Outstanding Universal Value of the Białowieża Forest Site 				
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate for Environmental Protection in Białystok Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding source	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research

Measure 2.3.1 Protection of water resources in the Białowieża Forest

Description of the measure <ul style="list-style-type: none"> – Development of a plan of measures for the protection of water resources in the Białowieża Forest, taking into account the following aspects: <ul style="list-style-type: none"> • status of the Białowieża Forest as a world heritage site and its Outstanding Universal Value; • results of the latest scientific research and analysis; reducing surface runoff using nature-based solutions relying as much as possible on the use of natural local material (e.g., lying tree trunks) - in zones 2, 3, 4b and 4c using only local material; in zone 4a - relying as much as possible on the use of natural local material; • taking care not to deteriorate water conditions in other habitats as a result of the implemented measures. • The development of the plan of measures should be guided by a catchment approach, i.e. take into account the implementation of measures leading to an increase of retention also in the area of the buffer zone, from which waters feed the ecosystems of the Białowieża Forest. 	
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate for Environmental Protection in Białystok Regional Water Management Authority in Białystok Regional Water Management Authority in Lublin
Cooperating entities	Minister competent for the environment Minister competent for water resources General Directorate for Environmental Protection Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże i Michałowo Scientific entities, NGOs
Beneficiaries	Minister competent for the environment Minister competent for water resources General Directorate for Environmental Protection State Forests National Forest Holding, General public, including the local community

Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding National Fund for Environmental Protection and Water Management Provincial Fund for Environmental Protection and Water Management in Białystok			

Measure 2.3.2 Protection of wild pollinators

Description of the measure <ul style="list-style-type: none"> – Development of an expert report including: <ul style="list-style-type: none"> • identification of the community of wild pollinators inhabiting the Białowieża Forest • assessment of the conservation status of their populations • identification of existing and potential threats, especially those arising from climate change and the spread of alien species • determination of the vulnerability to threats resulting from the introduction the western honeybee families into the ecosystem of the Białowieża Forest • determination of the level and distribution of permanent and periodic location of apiaries in the Białowieża Forest – Development of a plan for the protection of wild pollinators, taking into account: <ul style="list-style-type: none"> • the status of the Białowieża Forest as a world heritage site and its Outstanding Universal Value • provisions of the <i>Management Plan</i> for the Białowieża Forest Site, with particular emphasis on the limitations and opportunities arising from the adopted zoning of the Site 				
Connection to other measure directions	2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Białowieża National Park Regional Directorate for Environmental Protection in Białystok Białowieża, Browsk and Hajnówka Forest Districts Polish Beekeeping Association Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		
Potential funding source	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Objective 3. Preservation of the integrity of the Site as a whole

The objective is directed at protection of the integrity of the Białowieża Forest, the maintenance of which will contribute to the preservation of natural processes and biodiversity in the area. Integrity is a measure of the wholeness and intactness of the Site and its attributes, and is considered in terms of the presence within the Site of all the elements necessary to express its Outstanding Universal Value, the adequacy of the Site's size to provide a full representation of the features and processes indicative of its importance, and also in the context of exposure to adverse effects of development or neglect. With regard to criterion IX, the integrity of the Białowieża Forest accounts for its sufficient extensiveness and the presence within it of the necessary elements presenting the key aspects of the processes which are important for the long-term protection of ecosystems and their biodiversity. With regard to criterion X, the integrity characterizes the Białowieża Forest as a site with the greatest biodiversity and representativeness, being the living environment for diverse forms of flora, fauna and fungi characteristic of the biogeographic region and the considered ecosystems.

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,
- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border,
- **climate change and human activity:**
 - fire hazard,
 - spread of alien species.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **in the political and legal environment, including:**
 - geopolitical situation,
 - insufficient consideration of the UNESCO World Heritage Site status in legislation and decision-making,
- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **financial, including:**
 - lack of a (special) fund for the management of the Site, education and communication, as well as support of the socio-economic development,

- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 3.1.** Establishment of a consistent legal system to protect ecological processes and biodiversity within the Site.
- **Measure direction 3.2.** Taking steps to prevent fragmentation and isolation of habitats within the Site.
- **Measure direction 3.3.** Maintenance of connectivity between the Białowieża Forest and other forest complexes by protecting and shaping of ecological corridors.

Measure direction 3.1. Establishment of a consistent system to protect ecological processes and biodiversity within the Site.

Measure 3.1.1 Preparation of draft amendments to the applicable national law to improve the management of the Site

Description of the measure <ul style="list-style-type: none"> – Preparation of draft amendments to the national law (Forest Act, Nature Conservation Act, Environmental Law, Water Law, etc.) in a manner ensuring the effectiveness of the Plenipotentiary's actions in matters concerning the Site – Carrying out of analyses to consider the introduction of legislation dedicated to the Site (as exceptions in the applicable regulations or as a separate law adopted for the Site), and depending on the results of the analysis, possible drafting of a legal act together with implementing provisions to regulate the legal status of World Heritage sites in Poland, including in the context of development and spatial policy – Development of legal assumptions of a fund for World Heritage sites in Poland – Consideration in the above-mentioned analyses and proposed amendments to the law of the issue of designation and protection of ecological corridors (including river valleys) at all levels (national, regional, local) to ensure connectivity between areas of high natural value – 	
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research
Entity responsible for the implementation of the	Management Plenipotentiary for the Białowieża Forest Site

measure				
Cooperating entities	UNESCO World Heritage Centre Polish National Commission for UNESCO Białowieża National Park Regional Directorate for Environmental Protection in Białystok Regional Directorate of State Forests in Białystok General Directorate of State Forests General Directorate for Environmental Protection Minister competent for the environment Minister competent for culture and national heritage Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding National Fund for Environmental Protection and Water Management			

Measure 3.1.2 Support for the development of tools to manage natural World Heritage sites an international level

Description of the measure <ul style="list-style-type: none"> – Cooperation with international institutions - UNESCO World Heritage Centre and IUCN to obtain recommendations on management of the Site, exchange of information and experience, and the development of programs for World Heritage Sites, including a financing system for the sites – Participation in international projects on World Heritage areas and exchange of information and experience between countries concerning the management of natural heritage – Taking steps for the development of programs for World Heritage Sites at the European Union level, including a financing system for the sites – Strengthening the tools of Polish-Belarusian cooperation to regulate the rights and obligations under the multilateral agreement concerning the Białowieża Forest Site 	
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 2.1. Implementation of nature conservation plans established for all conservation forms at the Site 2.2. Planning and implementation of habitat and species protection in accordance with the recommendations of national and international regulations 2.3. Planning and implementation of conservation measures based on reliable knowledge and results of the latest scientific research
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site

Cooperating entities	UNESCO World Heritage Centre Polish National Commission for UNESCO Białowieża National Park General Directorate for Environmental Protection General Directorate of State Forests Minister competent for the environment Minister competent for culture and national heritage Minister competent for foreign affairs Minister competent for national defence Minister competent for nature conservation (Belarus) Belovezhskaya Pushcha National Park (Belarus) Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 3.2. Taking steps to prevent fragmentation and isolation of habitats within the Site

Measure 3.2.1 Preventing fragmentation and isolation of habitats within the Site

Description of the measure <ul style="list-style-type: none"> – Adoption of a holistic approach in nature conservation plans and forest management plans with nature conservation programs, emphasizing aspects such as: <ul style="list-style-type: none"> • protection of biocenotic trees in tree stands of all age classes • leaving large-size dead wood (does not apply to the Bison Breeding Center) • retention of water runoff from aquatic, wetland and humid habitats • results of analyses of environmental impact assessments for tasks involving investments • the use of such methods of combating invasive species which result in as little harm for the environment as possible (i.e., methods which help protect the integrity of the environment and reduce the risk of its fragmentation) – Consideration of the objectives and indicators of the <i>Management Plan</i> in the monitoring of nature conservation plans and forest management plans – Ensuring public participation in the development and monitoring of nature conservation plans and forest management plans 	
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 3.3 Maintenance of connectivity between the Białowieża Forest and other forest complexes by protecting and shaping of ecological corridors
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate for Environmental Protection in Białystok

Cooperating entities	General Directorate for Environmental Protection Minister competent for the environment Management Plenipotentiary for the Białowieża Forest Site Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Scientific entities NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Białowieża National Park Budget of the State Forests National Forest Holding National Fund for Environmental Protection and Water Management Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure 3.2.2 Development and promotion of the implementation of guidelines to address the existing and anticipated barriers contributing to fragmentation and isolation of habitats at the Site

Description of the measure	
<ul style="list-style-type: none"> – Development of guidelines indicating methods to minimize or completely reduce the impact of existing and planned barriers contributing to fragmentation and isolation of habitats within the area of the Site, taking into account various target groups, including the Border Guard, the Polish Army and the scientific community – Creation of incentives for the implementation of the developed guidelines and conducting of educational activities in this field 	
Connection to other measure directions	1.1. Ensuring passive protection of ecological processes within the Białowieża Forest Site 3.3 Maintenance of connectivity between the Białowieża Forest and other forest complexes by protecting and shaping of ecological corridors 6.1. Supporting activities to strengthen local community ties, including social initiatives related to the preservation of the landscape of the Białowieża Forest area
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Regional Directorate for Environmental Protection in Białystok
Cooperating entities	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Minister competent for the environment Minister competent for foreign affairs

	Minister competent for national defence Armed Forces of the Republic of Poland Scientific entities Podlaskie Border Guard Unit NGOs			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure direction 3.3. Maintenance of connectivity between the Białowieża Forest and other forest complexes by protecting and shaping of ecological corridors

Measure 3.3.1 Taking into account the protection and functioning of ecological corridors in planning documents and administrative decisions of the Białowieża Forest municipalities

Description of the measure <ul style="list-style-type: none"> – Strengthening the protection of ecological corridors by increased consideration of their functioning and the need for preservation in updating and development of planning documents by municipalities and in issuing administrative decisions in the area of the Site and its surroundings – Consideration of the objectives and indicators of the <i>Plan</i> in the monitoring of spatial planning documents – Ensuring public participation in the development, implementation and monitoring of spatial planning documents – Updating and development of a map of ecological corridors and habitat coherence at the scale of the Białowieża Forest region, national and continental scale (based on conducted research and analyses, as well as an interactive map of ecological corridors in Poland developed within the framework of <i>Projekt korytarzy ekologicznych łączących Europejską Sieć Natura 2000 w Polsce</i> [Project of ecological corridors connecting the European Natura 2000 Network in Poland] (Jędrzejewski et al. 2011)) – Development and publication of guidelines for the designation, protection and proper functioning of ecological corridors and ensuring the availability of resources (including an interactive map of ecological corridors) 	
Connection to other measure directions	5.1. Establishment of rules for the use of the resources of the Białowieża Forest, in compliance with national and international law 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area

Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province			
Cooperating entities	Białowieża National Park Regional Directorate for Environmental Protection in Białystok Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate of State Forests in Białystok Scientific entities NGOs National Support Centre for Agriculture			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measure 3.3.2 Promotion of the preservation and creation of mosaic natural structures supporting species migration in the buffer zone and in the wider surroundings of the Site

<p>Description of the measure</p> <ul style="list-style-type: none"> – Conducting analyses to identify the benefits of maintaining the connectivity of the Białowieża Forest area with other forest areas – Development of educational and promotional materials concerning the need to create and preserve diverse natural structures, including baulks and mid-field woodlots, a mosaic of areas with different uses (arable land, meadows, pastures, forests and woodlots) and their role in providing connectivity between the Białowieża Forest and other forest complexes – Promotion of the leaving of biocenotic trees in tree stands of all age classes in forest areas (including private forests) as well as the leaving of a certain amount of dead wood in the buffer zone and the wider surroundings of the Site – Promotion of afforestation (species-diverse, with a predominance of deciduous trees) on the edges of river valleys in the buffer zone and the wider surroundings of the Site – Maintenance of open spaces and promotion of extensive meadow management and extensive grazing in the buffer zone and the wider surroundings of the Site – Maintenance of mid-field woodlots and old orchards and fruit trees in the buffer zone and the wider surroundings of the Site – Promotion of the establishment of new orchards with old varieties of fruit trees and the cultivation of traditional crops (cereals, flax, etc.) in the vicinity of the Site – Maintenance of a mosaic of different crops with baulks – Prevention of the expansion of alien invasive species, in particular, Canadian goldenrod and cherry plum – Promotion of natural ponds in the buffer zone and the wider surroundings of the Site – Coordination of water management plans and agro-environmental-climate programs in the context of the management objectives for the UNESCO site
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Connection to other measure directions	8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Białowieża National Park Białowieża, Browsk, Hajnówka and Bielsk Forest Districts Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Czyże, Kleszczele and Michałowo Regional Directorate of State Forests in Białystok Regional Directorate for Environmental Protection in Białystok Scientific entities NGOs National Support Centre for Agriculture Agency For Restructuring and Modernization of Agriculture Polish Waters State Water Holding			
Beneficiaries	Minister competent for the environment General Directorate for Environmental Protection State Forests National Forest Holding General public, including the local community			
Implementation date	Continuous measure	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Objective 4. Promotion of and support for the cooperation between of international, national and local actors

The objective involves initiation, support and promotion of various forms of cooperation at every level. It refers to the joint actions of all actors and stakeholders for the protection of the Białowieża Forest and the World Heritage.

The objective is a response to the threats caused by (Annex 4):

- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - unsustainable tourism development,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **in the political and legal environment, including:**
 - geopolitical situation,
- **financial, including:**
 - lack of a (special) fund for the management of the Site, education and communication, as well as support of the socio-economic development,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 4.1.** Development and implementation, under the auspices of UNESCO, of a multi-year program of cooperation between local, national and international actors to preserve the natural heritage.
- **Measure direction 4.2.** Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site.
- **Measure direction 4.3.** Ensuring conditions for the strengthening of dialogue and cooperation between local and national institutions and international actors.

Measure direction 4.1. Development and implementation, under the auspices of UNESCO, of a multi-year program of cooperation between local, national and international actors to preserve the natural heritage

Measure 4.1.1 Development of a program of cooperation between local, national and international actors to preserve the natural world heritage

Description of the measure

- Development of a program of a transparent and participatory cooperation, together with key stakeholders
- Introduction into the program of the rules of cooperation with the UNESCO World Heritage Centre and IUCN, based on, among others, the Operational Guidelines
- Consideration of cooperation with the managers of the Białowieża Forest site on the Belarusian side within the scope of, among others, scientific research, monitoring of key attributes of the Site (in particular hydrological conditions), as well as operations as a response to threats
- Incorporation in the program of measures implemented in cooperation with the Polish National Commission for UNESCO
- Incorporation of cooperation with managers of other World Heritage Sites in Poland and all over the world for the purpose of joint promotion of the world heritage and exchange of good

practices – Identification of the fields of cooperation between management entities and the local community and determination of the roles of individual actors in the main joint operations – Linking of the implementation of the program with the operations of the Białowieża Forest World Heritage Site				
Connection to other measure directions	7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Polish National Commission for UNESCO			
Cooperating entities	UNESCO World Heritage Centre National Institute of Cultural Heritage Minister competent for the environment Białowieża National Park Belovezhskaya Pushcha National Park (Belarus) Regional Directorate of State Forests in Białystok Białowieża, Browsk and Hajnówka Forest Districts Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Podlaskie Border Guard Unit Minister competent for foreign affairs District Headquarters of the State Fire Service in Hajnówka Chief Inspectorate for Environmental Protection Scientific entities NGOs			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Measure direction 4.2. Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site

Measure 4.2.1 Development of a financial support mechanism for initiatives involving cooperation for the benefit of the Site

Description of the measure – Determining the priority of the fields of cooperation for initiatives involving cooperation for the benefit of the World Heritage Site – Development of the principles of a financial support mechanism in a transparent and participatory manner, in cooperation with identified key stakeholders, taking into account the recommendations of the UNESCO World Heritage Committee and the Polish National Commission for UNESCO
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– Dissemination of knowledge about the principles of the financial support mechanism and initiatives involving cooperation for the benefit of the World Heritage Site				
Connection to other measure directions	5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site 5.4. Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Minister competent for the environment			
Cooperating entities	Polish National Commission for UNESCO Regional Directorate of State Forests in Białystok Regional Directorate for Environmental Protection in Białystok Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Belovezhskaya Pushcha National Park (Belarus) Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Minister competent for foreign affairs Scientific entities NGOs			
Beneficiaries	Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele and Michałowo Local government of Podlaskie Province Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measure 4.2.2 Development of financial support mechanisms for local entities for the purpose of protection of the Site and sustainable development of the Białowieża Forest municipalities

Description of the measure – Recognition of initiatives of local actors for protection of the Site and sustainable development, concerning, among others: <ul style="list-style-type: none"> • development of sustainable tourism in the area of the Site • support for local products • ecological methods of heating and thermal modernization of buildings • protection and revitalization of the cultural landscape • continuation of programs to support farmers in the protection of European bison and
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<p>other protected species</p> <ul style="list-style-type: none"> – Determination of priorities for local communities with regard to initiatives for sustainable development and protection of the area of the Site and its surroundings – Involvement of institutions having the legal competences to implement initiatives – Development of the principles of a financial support mechanism in a transparent and participatory manner, in cooperation with identified key stakeholders, taking into account the recommendations of the UNESCO World Heritage Centre and the Polish National Commission for UNESCO – Dissemination of knowledge about the principles of the financial support mechanism for local entities for the purpose of sustainable development and protection of the area of the Site 				
Connection to other measure directions	<p>5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site</p> <p>5.4. Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services</p> <p>7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest</p> <p>8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area</p>			
Entity responsible for the implementation of the measure	<p>Management Plenipotentiary for the Białowieża Forest Site</p> <p>Minister competent for the environment</p> <p>Minister competent for funds and regional policy</p> <p>Minister competent for agriculture and rural areas</p>			
Cooperating entities	<p>Polish National Commission for UNESCO</p> <p>Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>Białowieża National Park</p> <p>Białowieża, Browsk and Hajnówka Forest Districts</p> <p>Scientific entities</p> <p>NGOs</p> <p>Parishes and religious associations</p>			
Beneficiaries	Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	<p>Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)</p> <p>National Fund for Environmental Protection and Water Management</p>			

Measure direction 4.3. Ensuring conditions for the strengthening of dialogue and cooperation between local and national institutions and international actors

Measure 4.3.1 Organization of periodic seminars (conferences) to strengthen cooperation and sharing of experience

Description of the measure <ul style="list-style-type: none"> – Use of the Białowieża Forest World Heritage Site Centre to organize periodic meetings (of different rank and for different groups of stakeholders) of a practical nature, related to the sharing of experience – Animation of cooperation (also at the international level) for young local development activists (e.g., through Youth Municipal Councils) 				
Connection to other measure directions	7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Polish National Commission for UNESCO Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts			
Cooperating entities	UNESCO World Heritage Centre Minister competent for the environment General Directorate of State Forests Regional Directorate of State Forests in Białystok Regional Directorate for Environmental Protection in Białystok Belovezhskaya Pushcha National Park (Belarus) Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Scientific entities NGOs			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measurement 4.3.2 Establishment and operation of a forum for the Site

Description of the measure <ul style="list-style-type: none"> – Creation of a forum for the Białowieża Forest (it may have a varied formula, both on site and online) providing a place for the sharing of experience and generation of ideas for cooperation between different groups of stakeholders at different levels (local, national, international) – The forum will enable direct discussions, meetings and cooperation between different circles of stakeholders, contributing to a better understanding of the possibility of incorporating the status of the Białowieża Forest Site into the management of local development 	
Connection to other	4.1. Development and implementation, under the auspices of

measure directions	<p>UNESCO, of a multi-year program of cooperation between local, national and international actors to preserve the natural heritage of humanity</p> <p>7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest</p> <p>8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area</p>			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Minister competent for the environment			
Cooperating entities	<p>UNESCO World Heritage Centre</p> <p>Polish National Commission for UNESCO</p> <p>Regional Directorate of State Forests in Białystok</p> <p>Białowieża, Browsk and Hajnówka Forest Districts</p> <p>Regional Directorate for Environmental Protection in Białystok</p> <p>Białowieża National Park</p> <p>Belovezhskaya Pushcha National Park (Belarus)</p> <p>Minister competent for foreign affairs</p> <p>Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>Scientific entities</p> <p>NGOs</p>			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	<p>Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)</p> <p>National Fund for Environmental Protection and Water Management</p>			

Objective 5. Creation of conditions for sustainable development of the Białowieża Forest municipalities

The objective assumes the strengthening of sustainability efforts in the surroundings of the site. It refers to various forms of support for the local governments in the Białowieża Forest region, which should motivate the community in its efforts to protect the natural heritage. Those forms of support should create conditions for cooperation not only between local actors, but also national and international ones.

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,

- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border,
- **climate change and human activity:**
 - fire hazard,
 - spread of alien species.

Thanks to the implementation of the objective, the following barriers will be eliminated (Annex 5):

- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **financial, including:**
 - lack of a (special) fund for the management of the Site, education and communication, as well as support of the socio-economic development,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 5.1.** Establishment of rules for the use of the resources of the Białowieża Forest, in compliance with national and international law.
- **Measure direction 5.2.** Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site.
- **Measure direction 5.3.** Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities.
- **Measure direction 5.4.** Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services.

Measure direction 5.1. Establishment of rules for the use of the resources of the Białowieża Forest, in compliance with national and international law

Measure 5.1.1 Development of rules for sustainable use of the Site and their dissemination

Description of the measure <ul style="list-style-type: none"> – Development of rules for sustainable use of the resources of the Białowieża Forest resulting from protection regimes binding within the Site – Establishment of a contact point and consultancy on the use of the resources of the Białowieża Forest – Development of transparent educational and promotional materials with the most important information about sustainable use of the area of the Site, including permissible uses of the Site, as well as benefits offered by the Site 				
Connection to other measure directions	4.2. Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site 5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site 5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 5.4. Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	UNESCO World Heritage Centre Polish National Commission for UNESCO Minister competent for the environment Regional Directorate of State Forests in Białystok Regional Directorate for Environmental Protection in Białystok Belovezhskaya Pushcha National Park (Belarus) Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczewo, Czyże and Michałowo Local government of Podlaskie Province Armed Forces of the Republic of Poland Podlaskie Border Guard Unit District Police Headquarters in Hajnówka Entrepreneurs Governor of Hajnówka district Scientific entities NGOs, including in the field of tourism			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
	X			X

Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Budget of the Białowieża National Park, Budget of the State Forests National Forest Holding National Fund for Environmental Protection and Water Management
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Measure direction 5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site

Measure 5.2.1 Introduction of expert support for public administration in development planning and decision-making processes

Description of the measure				
<ul style="list-style-type: none"> – Organization of a system of assistance for local governments in the processes of developing plans and programs, on a mandatory and optional basis, through: <ul style="list-style-type: none"> • ensuring the participation of experts to verify the quality of the prepared documents and ensure that the requirements arising from the Site's status as a World Heritage Site are correctly incorporated into those documents • providing expert support in decision-making processes, including within the scope of the assessment procedure of the environmental impact of projects, plans and programs – Acquisition of funds to cover the cost of expert support 				
Connection to other measure directions	4.2. Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site 5.4. Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Minister competent for the environment			
Cooperating entities	Scientific entities NGOs			
Beneficiaries	Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measure 5.2.2 Consultancy on the preparation of projects for sustainable socio-economic development of municipalities and environmental protection

Description of the measure				
<ul style="list-style-type: none"> – Support for the public administration in participation in projects by organizing cooperation with other entities of public administration, science, business and NGOs, building a cooperation network – Provision of expert support in the preparation of applications for funds for projects aimed at socio-economic development of municipalities and environmental protection from EU, EEA and other programs – Consultancy on new legislative instruments and technologies which can be implemented in the municipalities of the Białowieża Forest 				
Connection to other measure directions	4.2. Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site 5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Governor of Hajnówka district			
Cooperating entities	Minister competent for the environment Scientific entities NGOs Municipal educational institutions			
Beneficiaries	Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measure direction 5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities

Measure 5.3.1 Development of an integrated strategy for sustainable development of Białowieża Forest municipalities

Description of the measure				
<ul style="list-style-type: none"> – Evaluation of the existing development policy of municipalities in the Białowieża Forest area in the context of the use of the Białowieża Forest Site for promotion and territorial development – Promotion of good practices and benefits for local development resulting from location within the area or in the vicinity of the Białowieża Forest – Development of a joint, supra-local document to record the agreed objectives of sustainable development for all municipalities of the Białowieża Forest, taking into account the objectives and rules of the functioning of the Site – Participatory development of recommendations for local development policy in the context of the Białowieża Forest (i.e., recommendations and objectives to be included in local documents) 				
Connection to other measure directions	8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities Podlaskie Regional Tourism Organization			
Cooperating entities	Management Plenipotentiary for the Białowieża Forest Site Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Białowieża National Park Regional Directorate of State Forests in Białystok Białowieża, Browsk and Hajnówka Forest Districts NGOs Entrepreneurs Country Housewives' Clubs Municipal educational institutions			
Beneficiaries	Local community Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele and Michałowo Local government of Podlaskie Province NGOs Tourism organizations			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		
Potential funding sources	National Fund for Environmental Protection and Water Management Budgets of local governments Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) European Union funds			

Measure 5.3.2 Development of a supra-local tourism development strategy for the area of the Białowieża Forest

Description of the measure <ul style="list-style-type: none"> – Application of a cooperation instrument for the implementation of the supra-local strategy of tourism development management within the area of the Białowieża Forest municipalities – Preparation of a consistent policy of tourism development in the Białowieża Forest, taking into account the directions of measures within the scope of the Supralocal Development Strategy of the municipalities of the Hajnówka district and the Hajnówka district, as well as the need to reduce pressure on nature resulting from nature conservation plans – Incorporation of legal regulations resulting from the status of the World Heritage Site and forms of nature conservation in the objectives, development directions and measures – Consideration of the benefits for socio-economic development, as well as the threat to the preservation of the outstanding value of the Białowieża Forest – Ensuring cooperation between local government authorities and associations, organizations and businesses in the tourism sector in the process of information exchange as well as development and implementation of a strategic document – Ensuring cooperation with managers of the Białowieża Forest site on the Belarusian side in the process of information exchange as well as development and implementation of a strategic document – Incorporation in the Strategy of measures implemented in cooperation with the Polish National Commission for UNESCO – Consideration of the objectives and indicators of the <i>Plan</i> in the monitoring of the strategy, including the aspect of tourism pressure 	
Connection to other measure directions	8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area
Entity responsible for the implementation of the measure	Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities
Cooperating entities	<p>UNESCO World Heritage Centre</p> <p>Polish National Commission for UNESCO</p> <p>Management Plenipotentiary for the Białowieża Forest Site</p> <p>Minister competent for the environment</p> <p>Regional Directorate of State Forests in Białystok</p> <p>Białowieża, Browsk and Hajnówka Forest Districts</p> <p>Regional Directorate for Environmental Protection in Białystok</p> <p>Białowieża National Park</p> <p>Belovezhskaya Pushcha National Park (Belarus)</p> <p>Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczcele, Czyże and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>Scientific entities</p> <p>NGOs</p>
Beneficiaries	<p>Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczcele and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>Local community</p>

Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management			

Measure direction 5.4. Supporting local communities in the area of the Białowieża Forest by ensuring accessibility to high quality public services

Measure 5.4.1 Supporting measures to improve the quality of the environment in the Białowieża Forest surroundings

Description of the measure <ul style="list-style-type: none"> – Identification of the needs and potential of the Białowieża Forest municipalities in terms of implementation of systemic solutions for environmental protection, including heat supply, water and sewage management and waste management – Consideration of climate change problems and adaptation to the effects of those changes in the identification of the needs and potential of the Białowieża Forest municipalities in terms of implementation of systemic solutions for environmental protection (including abandoning the use of solid fuels for heating purposes) – Taking steps to expand the scope of monitoring of the environment quality – Identification of priority measures to strengthen the environment protection infrastructure in the surroundings of the Białowieża Forest – Cooperation with Białowieża Forest municipalities in the implementation of zero-emission and closed-loop economy solutions – Support and expert consultancy concerning the acquisition of funds for investments in the area of environment protection 	
Connection to other measure directions	4.2. Creation of financial incentives for cooperation for the benefit of the Białowieża Forest Site 5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Minister competent for the environment Minister competent for development Provincial Inspectorate for Environmental Protection in Białystok
Cooperating entities	Local government of Podlaskie Province Chief Inspectorate for Environmental Protection Local community Scientific entities

	NGOs			
Beneficiaries	Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management Provincial Fund for Environmental Protection and Water Management			

Measure 5.4.2 Social integration and intergenerational leisure services

Description of the measure <ul style="list-style-type: none"> – Development of an offer of intergenerational workshops based on topics related to the cultural heritage of the Białowieża Forest region – Increase of the multifunctional use of educational and cultural facilities (cultural centres, day care centres) as places for intergenerational meetings concerning the Białowieża Forest, with their incorporation in the heritage tourism offer and linking them to the workshop offer (for residents and tourists) – Establishment of daytime meeting places for seniors (including the creation of spoken archives for the Białowieża Forest area) – Creation of a neighbourhood support networks based on time banks 				
Connection to other measure directions	5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 6.1. Supporting activities to strengthen local community ties, including social initiatives related to the preservation of the landscape of the Białowieża Forest area 7.1. Creation and implementation of a comprehensive strategy of environmental and cultural education in the context of the World Heritage protection objectives, including in particular the Białowieża Forest			
Entity responsible for the implementation of the measure	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Cultural institutions Scientific entities NGOs			
Cooperating entities	Local government of Podlaskie Province Podlaskie Regional Tourism Organization Council of Senior Citizens of the Marshal of Podlaskie Province Management Plenipotentiary for the Białowieża Forest Site Parishes and religious associations			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X

Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management Provincial Fund for Environmental Protection and Water Management
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Measure 5.4.3 Implementation of green public procurement

Description of the measure				
<ul style="list-style-type: none"> – Trainings for public administration and other entities applying the public procurement law on the possibility of using green and social clauses (implementation of the principles of socially responsible organization in the administration) – Gradual implementation of green clauses in public procurement – Promotion of local manufacturers and artists whose activities are based on the Białowieża Forest 				
Connection to other measure directions	8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Entrepreneurs holding environmental certificates Minister competent for the environment			
Beneficiaries	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local community, including entrepreneurs			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management Provincial Fund for Environmental Protection and Water Management			

Objective 6. Strengthening of the identity and pride of local communities on the basis of knowledge of the natural, cultural and historical values of the Białowieża Forest

Objective directed at integration of knowledge of the natural, cultural and historical values of the Białowieża Forest into the building of local social ties and the identity of residents of the Białowieża Forest region.

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,

- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border,
- **climate change and human activity:**
 - fire hazard,
 - spread of alien species.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **financial, including:**
 - lack of a (special) fund for the management of the Site, education and communication, as well as support of the socio-economic development,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 6.1.** Supporting activities to strengthen local community ties, including social initiatives related to the preservation of the landscape of the Białowieża Forest area.
- **Measure direction 6.2.** Development of competences of the public administration in terms of public participation in decision-making regarding the Białowieża Forest area.
- **Measure direction 6.3.** Promotion of economic activity, including tourism, inspired by the natural and cultural heritage of the Białowieża Forest area.
- **Measure direction 6.4.** Incorporation of world heritage protection objectives and information about the Białowieża Forest in school curricula in the Białowieża Forest region.

Measure direction 6.1. Supporting activities to strengthen local community ties, including social initiatives related to the preservation of the landscape of the Białowieża Forest area

Measure 6.1.1 Protection of the intangible heritage of the Białowieża Forest and dissemination of knowledge about it

Description of the measure <ul style="list-style-type: none"> – Identification of resources of the intangible cultural heritage of the Białowieża Forest: – Creation of knowledge resources on the intangible heritage of the Białowieża Forest by documenting traditions, customs, rituals, skills, as well as spoken history accounts of the residents of localities in the surroundings of the Białowieża Forest – Integration of the topic of the intangible heritage of the Białowieża Forest into educational activities (formal and informal education) – Popularization of local intangible heritage (among others, through projects implemented by country housewives' clubs, NGOs, cultural institutions) – Promotion of intangible heritage resources through inclusion in the national list of intangible cultural heritage or in the national register of good practices for the preservation of intangible cultural heritage – Integration of activities and support for local cultural centres, associations, individual stakeholders in efforts to protect intangible cultural heritage and maintain intergenerational transfer – Consultancy for public administration on integration of intangible heritage protection into the socio-economic development of Białowieża Forest municipalities 				
Connection to other measure directions	7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Organizational units of municipalities - educational and cultural institutions Minister competent for culture and national heritage Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Polish National Commission for UNESCO Local government of Podlaskie Province National Institute of Cultural Heritage Scientific entities NGOs Parishes and religious associations Provincial Monument Conservation Officer Country Housewives' Clubs			
Beneficiaries	Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Budget of the minister competent for culture and national heritage			

Measure 6.1.2 Protection and promotion of cultural assets and landscapes of the Białowieża Forest

Description of the measure <ul style="list-style-type: none"> – Creation of knowledge resources on the material heritage of the Białowieża Forest, carrying out inventories of cultural heritage sites, including a full archaeological survey of the Białowieża Forest – Documentation of the material heritage resources of the Białowieża Forest, including the introduction of archaeological sites on situational and overview maps of natural and cultural values and in nature conservation programs and forest management plans – Development of programs for revitalization of cultural heritage sites – Expert support for the achievement of spatial order and protection of rural arrangements, local construction and archaeological sites through respective provisions in the planning documents of the Białowieża Forest municipalities – Ensuring the protection of known archaeological sites within the area of the Białowieża Forest Site and its buffer zone in accordance with national law – Promotion of material heritage resources through the development and dissemination of educational materials and information on cultural heritage sites, conducting education aimed at preventing the penetration of the Forest areas by so-called treasure hunters – Incorporation of the topic of protection and shaping of the cultural landscape into school curricula in the Białowieża Forest municipalities – Development of a curriculum and organization of patronage classes in the area of local architecture and professions related to traditional architecture (Forestry Technical School in Białowieża) – Promotion of traditional land use in the Białowieża Forest in terms of cultivation, meadow management and grazing in open areas as well as promotion of the cultivation of old varieties of trees 	
Connection to other measure directions	<p>3.3 Maintenance of connectivity between the Białowieża Forest and other forest complexes by protecting and shaping of ecological corridors</p> <p>7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest</p>
Entity responsible for the implementation of the measure	<p>Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo</p> <p>Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities</p> <p>Minister competent for culture and national heritage</p> <p>Management Plenipotentiary for the Białowieża Forest Site</p>
Cooperating entities	<p>Polish National Commission for UNESCO</p> <p>Organizational units of municipalities - educational and cultural institutions</p> <p>Local government of Podlaskie Province</p> <p>National Institute of Cultural Heritage</p> <p>Białowieża, Browsk and Hajnówka Forest Districts</p> <p>Scientific entities</p> <p>NGOs</p> <p>Parishes and religious associations</p> <p>Provincial Monument Conservation Officer</p>
Beneficiaries	General public, including the local community

	Local governments of Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele and Michałowo			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Budget of the minister competent for culture and national heritage			

Measure direction 6.2. Development of competences of the public administration in terms of public participation in decision-making regarding the Białowieża Forest area

Measure 6.2.1 Trainings for public administration and consultancy concerning the participation of the local community in decision-making

Description of the measure <ul style="list-style-type: none"> – Preparation and conducting of trainings on public participation in decision-making regarding the Site and the Białowieża Forest region – Consideration of issues related to access to environmental information, public participation in environmental proceedings (participation in administrative proceedings and lawmaking proceedings) – Incorporation of soft skill improvement in the use of methods and techniques for conducting public consultations – Ensuring consultancy by social communication experts for the purposes of development and implementation in municipalities of the principles of participation, development planning and decision-making in the Białowieża Forest municipalities 				
Connection to other measure directions	5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Scientific entities NGOs			
Cooperating entities	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Czyże, Kleszczele and Michałowo National Institute of Cultural Heritage Polish National Commission for UNESCO Provincial Monument Conservation Officer			
Beneficiaries	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X

Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds
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Measure direction 6.3. Promotion of economic activity, including tourism, inspired by the natural and cultural heritage of the Białowieża Forest area

Measure 6.3.1 Local platform for the exchange of information on economic activity, including tourism, inspired by the natural and cultural heritage of the Białowieża Forest area

Description of the measure: <ul style="list-style-type: none"> – Ensuring close cooperation between the public and private sectors, as well as other organizations interested in the development of economic activity in the Białowieża Forest region, including tourism, through the creation of a partnership structure (ensuring appropriate coordination of promotional activities and information exchange) – Development of a set of guidelines and measures (good practices) in the area of development opportunities for economic activity related to UNESCO sites in Poland and all over the world – Development of a consistent system to promote economic activity, including tourism, for the region of the Site – Development of a system for collecting information and promotion of local products supporting the protection and promotion of the Site 				
Connection to other measure directions	4.1. Development and implementation, under the auspices of UNESCO, of a multi-year program of cooperation between local, national and international actors to preserve the natural heritage of humanity 4.3. Ensuring conditions for the strengthening of dialogue and cooperation between local and national institutions and international actors			
Entity responsible for the implementation of the measure	Podlaskie Regional Tourism Organization Local government of Podlaskie Province Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	National Institute of Cultural Heritage Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Entrepreneurs Regional Directorate of State Forests in Białystok Białowieża, Browsk and Hajnówka Forest Districts Białowieża National Park Belovezhskaya Pushcha National Park (Belarus) NGOs, Tourism organizations			
Beneficiaries	Local community, including entrepreneurs			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
	X			X

Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Funds for the development of entrepreneurship and tourism of other entities cooperating in the implementation of the measure European Union funds
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Measure 6.3.2 Establishment of an award for an entrepreneur supporting the protection and promotion of the Site

Description of the measure: <ul style="list-style-type: none"> – Commencement of cooperation with the Polish Tourism Organization (or a Regional Tourism Organization) and other organizations promoting the heritage of the Białowieża Forest to establish an award for entrepreneurs (micro and small enterprises) – Establishment of an Award Jury elected in a participatory manner (with representatives of the World Heritage Site managers and NGOs) – Promotion of the competition and the award – Development of a certification mark for the awardees (linked to the visual identification of the Białowieża Forest municipalities) 				
Connection to other measure directions	5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area			
Entity responsible for the implementation of the measure	Management Plenipotentiary for the Białowieża Forest Site Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities			
Cooperating entities	Polish Tourism Organisation and Podlaskie Regional Tourism Organization NGOs Local government of Podlaskie Province Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local entrepreneurs Minister competent for the environment Minister competent for culture and national heritage Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate of State Forests in Białystok National Institute of Cultural Heritage			
Beneficiaries	Local community, including entrepreneurs			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
	X			X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) Funds for the development of entrepreneurship and tourism of other entities cooperating in the implementation of the measure			

Measure direction 6.4. Incorporation of world heritage protection objectives and information about the Białowieża Forest in school curricula in the Białowieża Forest region

Measure 6.4.1 Incorporation of world heritage protection objectives and information about the Białowieża Forest in school curricula in the Białowieża Forest region

Description of the measure <ul style="list-style-type: none"> – Initiation of cooperation with the Podlaskie Education Board and the Ministry competent for education and science to include the topic of world heritage protection and information about the Białowieża Forest in school curricula in the Białowieża Forest municipalities – Development of educational materials about the Site to be used by primary and secondary school teachers as a starting point for discussion of the topic of protection of the Białowieża Forest World Heritage Site – Development and implementation of an e-learning platform as a supplement to the core curriculum – Creation of a database of educational materials in an electronic form, provided by the teacher during traditional lessons or in the form of tasks to be completed by students independently – Support for the establishment and organization of special interest clubs in schools in the Białowieża Forest region – Activities aimed at inclusion of educational institutions in the UNESCO Associated Schools Network 				
Connection to other measure directions	7.1. Creation and implementation of a comprehensive strategy of environmental and cultural education in the context of the World Heritage protection objectives, including in particular the Białowieża Forest 7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Podlaskie Education Board Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Minister competent for education and science Minister competent for the environment Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Local government of Podlaskie Province Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Educational institutions Scientific entities, NGOs			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Objective 7. Provision of environmental and cultural education and promotion of the World Heritage Site

The objective involves raising of public awareness of the value of the Białowieża Forest Site, the conditions necessary for its proper functioning as well as the benefits it brings to individual social groups. Adequate measures in this regard should be carried out in different age and social groups (with particular emphasis on the Managers, local government authorities and the local community).

The objective is a response to the threats caused by (Annex 4):

- **climate change, including:**
 - rate of increase in global temperature,
 - droughts and changes in snow cover,
 - extreme weather conditions related to intense precipitation and strong winds,
- **human activity, including:**
 - fragmentation and isolation of habitats and populations,
 - logging and removal of dead trees,
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - emissions of pollutants,
 - migration crisis,
 - barrier on the Polish-Belarusian border,
- **climate change and human activity:**
 - fire hazard,
 - spread of alien species.

Achievement of the objective will contribute to the elimination of barriers (Annex 5):

- **in the political and legal environment, including:**
 - geopolitical situation,
 - insufficient consideration of the UNESCO World Heritage Site status in legislation and decision-making,
- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - insufficient and ineffective education about the Site,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, the following directions of implemented measures have been established:

- **Measure direction 7.1.** Creation and implementation of a comprehensive strategy of environmental and cultural education in the context of the World Heritage protection objectives, including in particular the Białowieża Forest.
- **Measure direction 7.2.** Establishment of the Białowieża Forest World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value.
- **Measure direction 7.3.** Raising the level of knowledge of the managers and other stakeholders in the *Plan* regarding the Outstanding Universal Value of the Site.

Measure direction 7.1. Creation and implementation of a comprehensive strategy of environmental and cultural education in the context of the World Heritage protection objectives, including in particular the Białowieża Forest

Measure 7.1.1 Development of a strategy of environmental and cultural education in the context of the World Heritage protection objectives, including the Białowieża Forest

Description of the measure <ul style="list-style-type: none"> – Establishment of a cooperation network for educators and institutions interested in the topic of environmental protection, natural and cultural heritage in order to develop a common strategy of activities – Development of educational materials to broaden and supplement knowledge on the protection of world heritage, including in particular the Białowieża Forest – Development and implementation of an e-learning platform to offer a knowledge base for stakeholders – Development a concept of activities in the area of formal and non-formal environmental and cultural education – Organization of temporary exhibitions as part of the activity of the Białowieża Forest World Heritage Site Centre 	
Connection to other measure directions	7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Management Plenipotentiary for the Białowieża Forest Site Podlaskie Education Board
Cooperating entities	Polish National Commission for UNESCO Minister competent for the environment Local government of Podlaskie Province Regional Directorate of State Forests in Białystok Cultural centres Institutions of formal and non-formal education Scientific and Academic Computer Network - National Research Institute National Institute of Cultural Heritage Scientific entities NGOs Parishes and religious associations

Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Measure direction 7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest

Measures 7.2.1 Establishment of the World Heritage Site Centre

Description of the measure <ul style="list-style-type: none"> – Establishment of an educational centre within the area of the Białowieża Forest to disseminate knowledge about UNESCO world heritage – Participatory development of a program of the Centre's activities, including definition of the rules of its operation – Mapping of potential cooperating entities to broaden and disseminate knowledge about the Białowieża Forest and UNESCO world heritage, including those offering environmental education at the local level – Commencement and conducting of cooperation with other entities acting for UNESCO to share experience and good practices and to implement joint projects based on education and participation synergies – Conducting civic education on the protection of UNESCO world heritage; – Cooperation with organizational units of municipalities, including educational and cultural units – Establishment of a consultation and information point for stakeholders at the centre – Collection of knowledge resources about the Białowieża Forest and making them available in the OpenData formula – Coordination of educational initiatives at the local level – Finding and using unconventional methods to educate about the natural heritage – Conducting periodic surveys of knowledge and awareness of World Heritage Sites – Preparation of a popular-scientific publication on good practices in the management of the transboundary UNESCO site, taking into account knowledge from previous scientific research conducted on both sides of the Polish-Belarusian border – Promotion and dissemination of publications in cooperation with the Polish National Commission for UNESCO and the World Heritage Centre 	
Connection to other measure directions	1.2. Conducting scientific research at the Białowieża Forest Site 4.1. Development and implementation, under the auspices of UNESCO, of a multi-year program of cooperation between local, national and international actors to preserve the natural heritage of humanity 4.3. Ensuring conditions for the strengthening of dialogue and cooperation between local and national institutions and international actors

Entity responsible for the implementation of the measure	Minister competent for the environment Minister competent for culture and national heritage Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Polish National Commission for UNESCO Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Regional Directorate of State Forests in Białystok Local government of Podlaskie Province Cultural centres Institutions of formal and non-formal education Scientific and Academic Computer Network - National Research Institute National Institute of Cultural Heritage Scientific entities NGOs Parishes and religious associations			
Beneficiaries	General public, including the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Measure 7.2.2 Dissemination of knowledge about the Site and its importance for present and future generations

Description of the measure <ul style="list-style-type: none"> – Popularization of research results through the preparation of a textbook on UNESCO natural heritage on the example of the Białowieża Forest, including a glossary of terms in Polish, English and Belarusian language, and promotion of the publication – Cooperation with the Polish National Commission for UNESCO in promoting the results of research concerning the Białowieża Forest – Promotion of research results at international conferences and events dedicated to sustainable development – Promotion of research results in cooperation with institutions and individuals popularizing science (use of creative industries to promote research results, e.g. computer games, board games, fashion, design) 	
Connection to other measure directions	1.2. Conducting scientific research at the Białowieża Forest Site 1.3. Monitoring of abiotic and biotic factors affecting the ecological processes 7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Management Plenipotentiary for the Białowieża Forest Site
Cooperating entities	UNESCO World Heritage Centre Polish National Commission for UNESCO International Union for Conservation of Nature (IUCN)

	Minister competent for the environment Regional Directorate of State Forests in Białystok Belovezhskaya Pushcha National Park (Belarus) Scientific entities NGOs			
Beneficiaries	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts General public, primarily the local community			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Measure direction 7.3. Raising the level of knowledge of the managers and other stakeholders in the Plan regarding the Outstanding Universal Value of the Site

Measure 7.3.1 Conducting education for public administration employees about the Site

Description of the measure <ul style="list-style-type: none"> – Development of a textbook on World Heritage Sites, including the protection of the Białowieża Forest and opportunities for socio-economic development, taking into account the protection of the Outstanding Universal Value of the Site – Development and conducting of periodic trainings on the Outstanding Universal Value of the Site for public administration employees at all levels – Development and conducting of periodic trainings on the Outstanding Universal Value of the Site for Border Guard employees – Development of a toolbox for the management within the area of the Site and in its surroundings, taking into account good practices from Poland and the whole world, and its promotion 	
Connection to other measure directions	5.2. Providing support and expert assistance to local governments of Białowieża Forest municipalities in the sustainable use of the surroundings of the Białowieża Forest Site 7.2. Establishment of the Białowieża Forest World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value
Entity responsible for the implementation of the measure	Minister competent for the environment National Institute of Cultural Heritage Management Plenipotentiary for the Białowieża Forest Site
Cooperating entities	Polish National Commission for UNESCO Białowieża National Park General Directorate for Environmental Protection Regional Directorate of State Forests in Białystok Białowieża, Browsk and Hajnówka Forest Districts Scientific entities NGOs

Beneficiaries	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Kleszczele, Czeremcha, Czyże and Michałowo Local community Podlaskie Border Guard Unit			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
	X			X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site National Fund for Environmental Protection and Water Management European Union funds			

Measure 7.3.2 Establishment and maintenance of an educational path dedicated to the Outstanding Universal Value

Description of the measure <ul style="list-style-type: none"> – Setting up of an educational path within the Site presenting the Outstanding Universal Value and criteria for inscription on the UNESCO World Heritage List – Development of information boards and a mobile application about the OUV of the Site and signage of the educational path – Ensuring durability of the educational path – Cooperation with educators, including NGOs, on thematic activities – Training for guides about the OUV of the Site 				
Connection to other measure directions	5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest			
Entity responsible for the implementation of the measure	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Management Plenipotentiary for the Białowieża Forest Site			
Cooperating entities	Polish National Commission for UNESCO National Institute of Cultural Heritage NGOs Scientific entities			
Beneficiaries	Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local community Tourists			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
	X			X
Potential funding sources	Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) National Fund for Environmental Protection and Water Management European Union funds			

Objective 8. Use of the outstanding value of the World Heritage Site to promote the Białowieża Forest region

The objective involves promotion of the region, territorial marketing and use of the Białowieża Forest brand for local and regional development. An important element of promotion and information about the Białowieża Forest must be the dissemination (in a manner tailored to different groups of recipients) of the results of scientific research. The dissemination of scientific knowledge about the Białowieża Forest should ensure the recognizability of the Białowieża Forest World Heritage Site on a global, national, regional and local level. By securing UNESCO and IUCN support as well as international cooperation in the field of nature conservation, it will be possible to improve cooperation with Belarusian stakeholders.

The objective is a response to the threats caused by (Annex 4):

- **human activity, including:**
 - unsustainable tourism development,
 - development of buildings in the buffer zone,
 - unauthorized use of resources,
 - interference and disturbance caused by human activity,
 - migration crisis.

Thanks to the implementation of the objective, the following barriers will be eliminated (Annex 5):

- **organizational, including:**
 - lack of a uniform system (including structure) to manage the Site,
 - insufficient coordination of development planning systems,
- **financial, including:**
 - lack of a (special) fund for the management of the Site, education and communication as well as support of the socio-economic development,
- **related to stakeholders and users of the Białowieża Forest, including:**
 - ineffective communication of information about the objectives of protecting the World Heritage values,
 - gaps in knowledge among managers and users regarding the objectives and values of the Site,
 - limited cooperation between various interest groups.

In order to achieve the objective, one direction of implemented measures has been established:

- **Measure direction 8.1.** Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area.

Measure direction 8.1. Creation and management of the territorial brand of the Białowieża Forest Site, including the development and effective implementation of the visual identification of the Białowieża Forest area

Measure 8.1.1 Development of visual identification for Białowieża Forest municipalities and creation of incentives for adoption of landscape resolutions

Description of the measure	<ul style="list-style-type: none"> – Promotion of the World Heritage Site as a tourist attraction – Development of visual identification for the Site as a whole (not for individual municipalities) including: <ul style="list-style-type: none"> • A sign (equivalent to a coat of arms) for the entire Białowieża Forest region • Designation of projects implemented as elements of pro-development measures • Signage for trails and tourist attractions • Designs of small architecture (in particular tourist and recreational architecture) • Designs for signs and advertisements along with a program to support entrepreneurs (e.g., grants) who will manufacture signs and advertisements according to the requirements – Consideration of the identity of the Białowieża Forest landscape in the visual identification – Ensuring supra-municipal cooperation and joint development of solutions together with the local community – Use of visual identification to promote the region – Promotion of the development and adoption of landscape resolutions in Białowieża Forest municipalities and provision of expert support to local governments in their development
Connection to other measure directions	<p>5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities</p> <p>7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest</p>
Entity responsible for the implementation of the measure	Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities
Cooperating entities	<p>Management Plenipotentiary for the Białowieża Forest Site</p> <p>Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>Białowieża National Park</p> <p>Regional Directorate of State Forests in Białystok</p> <p>Białowieża, Browsk and Hajnówka Forest Districts</p> <p>NGOs</p> <p>Tourism organizations</p> <p>Entrepreneurs</p> <p>National Institute of Cultural Heritage</p>
Beneficiaries	<p>Local community, including entrepreneurs in the tourism sector</p> <p>Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo</p> <p>Local government of Podlaskie Province</p> <p>NGOs</p>

	Tourism organizations			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
		X		X
Potential funding sources	National Fund for Environmental Protection and Water Management Budgets of local governments European Union funds Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined)			

Measure 8.1.2 Promotion and development of tourism within the territory of Białowieża Forest municipalities with the use of visual identification

Description of the measure <ul style="list-style-type: none"> – Adoption of a joint strategy for promotion of the area, including a survey of existing local measures, with the use of visual identification – Maintenance of a joint calendar of events and attractions for the entire area (according to the principle of complementary rather than competitive offers) – Together with all stakeholders, joint development of (thematically diverse) network tourism products and their promotion – Increased use of cultural heritage (especially intangible heritage) in promotion – Incorporation of the World Heritage brand in the promotion of the Białowieża Forest area 	
Connection to other measure directions	5.3. Preparation and implementation of supra-local strategies for the development of Białowieża Forest municipalities 6.1. Supporting activities to strengthen local community ties, including social initiatives related to the preservation of the landscape of the Białowieża Forest area 7.2. Establishment of the World Heritage Site Centre dedicated to the interpretation of the Outstanding Universal Value of the Białowieża Forest
Entity responsible for the implementation of the measure	Supra-local entity - District or Structure for the Functional Area, or Union of Municipalities Management Plenipotentiary for the Białowieża Forest Site Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo Local government of Podlaskie Province
Cooperating entities	Regional Directorate of State Forests in Białystok NGOs Tourist and guide organizations Entrepreneurs National Institute of Cultural Heritage Parishes and religious associations Association of Municipalities of the Białowieża Forest Euroregion Local Action Group
Beneficiaries	Local community, including entrepreneurs in the tourism sector Local governments: Białowieża, Hajnówka, the town of Hajnówka, Narew, Narewka, Dubicze Cerkiewne, Czeremcha, Kleszczele, Czyże and Michałowo

	Local government of Podlaskie Province NGOs Tourism organizations			
Implementation date	First year	Up to five years	Up to ten years	Continuous measure
				X
Potential funding sources	Budget of the State Forests National Forest Holding Budget of the Białowieża National Park, Budgets of local governments Budget of the Management Plenipotentiary for the Białowieża Forest Site (to be determined) European Union funds Funds of tourism organizations (e.g., the regional tourism organization)			

5.2 Summary of expert recommendations

The recommendations are a synthesis of guidelines and recommendations, determined on the basis of expert knowledge, research results and general analyses related to the protection of the Outstanding Universal Value of the Site, and some of them are presented in expert reports (a list of expert reports can be found in Annex 2). The recommendations are summarized in the table below (table 6), divided into two sections devoted respectively to the preservation of the Outstanding Universal Value and to the sustainable use of the Site taking into account its buffer zone and the wider surroundings. It should be noted that the recommendations serve as guidelines, identifying important aspects to be considered in the documents specified in chapter 6.2.

Table 6. List of expert recommendations for the preservation of the Outstanding Universal Value of the Site

Reference		Recommendations
Natural habitats	Subcontinental oak-hornbeam forest (9170)	<ul style="list-style-type: none"> In zone 4a and 4b, shaping of multi-generation tree stands with a diverse structure and leaving large-size dead wood and the gradual abandoning of the active protection measures (except for Melliti-Carpinetum forests) once their natural species compositions (as proposed in forest management plans) are achieved.
	Bog woodland (91D0)	<ul style="list-style-type: none"> Reduction of the threat posed by changing water relations and ensuring that within the scope of environmental impact assessments, the impact on the habitat of road construction or modernization measures is evaluated in detail (allowed only in the buffer zone outside the forest area indicated in the renomination application).
	Willow, poplar, alder and ash alluvial forests (91E0)	<ul style="list-style-type: none"> Ensuring protection against threats occurring in river valleys and forest watercourses and in spring areas by including a detailed evaluation of the impact of road modernization and construction on the habitat as part of the environmental impact assessment (allowed only in the buffer zone outside the forest area indicated in the renomination application).
	Oak-ash-elm riparian mixed forests (91F0)	<ul style="list-style-type: none"> Not conducting silvicultural treatments in patches and ensuring conditions for the formation of a natural riparian structure with plenty of dead wood.
	Thermophilic oak forests (91I0)	<ul style="list-style-type: none"> Maintenance of habitat patches or improvement of their condition.

Reference		Recommendations
	Old river beds and natural eutrophic water reservoirs with communities of <i>Nympheion</i> , <i>Potamion</i> (3150)	<ul style="list-style-type: none"> • Preservation of the area of habitats and ensuring that their conservation status is improved by maintaining proper water relations in the drainage basins of forest watercourses (slowing down the runoff), including the protection of beavers, whose activity (especially dam construction) promotes habitat formation. • Expanding knowledge of the conservation status of existing patches and the occurrence of the habitat in new sites.
	Lowland and mountain <i>Nardus</i> grasslands (6230)	<ul style="list-style-type: none"> • Restoration of proper conservation status through livestock grazing or mechanical mowing of meadows once a year, with mowing allowed once every two years: <ul style="list-style-type: none"> – from July to August; – with partial collection of biomass to remove or deposit in a hay barrack on site; – leaving 10-20% not mowed; • Ensuring protection of habitat patches at fire department access routes and water intake points (with no works conducted within the patches).
	Lowland and mountain hay meadows used extensively (6510)	<ul style="list-style-type: none"> • Restoration of proper conservation status through mechanical mowing of meadows once a year, with mowing allowed once every two years on part of the area: <ul style="list-style-type: none"> – from June to August, with collection and removal of biomass or depositing it in a hay barrack on site; – possible local (spot) leveling of the meadow surface (by hand or mechanically, using a levelling plate); – leaving 10-20% not mowed; – mowing can be supported by animal grazing.
	Transition mires and quaking bogs (7140)	<ul style="list-style-type: none"> • Monitoring of habitat patches.
Plant species	<i>Buxbaumia viridis</i> (green shield-moss)	<ul style="list-style-type: none"> • Maintenance of passive protection. • In cases of conditional removal of trees in Zone 4a and 4b for safety reasons (in accordance with the <i>Forest Fire Protection and Prevention Plan</i>), it is proposed to each time make sure that the species is not present on the trunk.
	<i>Dicranum viride</i>	<ul style="list-style-type: none"> • Maintenance of passive protection. • In locations of the species in zone 4a and 4b, ensuring protection and limiting economic activities around the location so as not to change light and moisture conditions. • When removing trees in zone 4 for fire safety or public safety reasons, removal of only the top part of the log, leaving the highest trunk possible.
	<i>Thesium ebracteatum</i>	<ul style="list-style-type: none"> • Reduction of competition from undergrowth plants as well as trees and shrubs through grazing or mowing in zone 4a and 4b.
	<i>Pulsatilla patens</i> (Eastern pasqueflower)	<ul style="list-style-type: none"> • Conducting active protection of the species by limiting the succession of roadside vegetation in zone 4a and 4b.
	<i>Agrimonia pilosa</i> (hairy agrimony)	<ul style="list-style-type: none"> • Mowing to limit the expansion of competing plants at roadside locations in Zone 4a and 4b.
Invasive species		<ul style="list-style-type: none"> • Monitoring of alien species. • Development of consistent measures for dealing with invasive alien species, preceded by in-depth analysis and evaluation, including measures in zones 2-4 of the Site and in its buffer zone.

Reference	Recommendations
Fungi	<ul style="list-style-type: none"> • Exclusion from forest management activities of all tree stands of 100 or more years of age (according to the definition of a 100-year-old tree stand adopted in this Plan). • Ensuring protection of dead trees; in tree stands of Zone 4b and 4c and the buffer zone (forest area within the boundaries of the Hajnówka Forest District located around Hajnówka and not included in the Site), leaving all more than 100-year-old¹⁴ dead trees until their complete mineralization (except in situations posing a risk to public safety). • During management activities in Zone 4a and 4b, leaving all biocenotic trees, i.e., with defects, damage, numerous microhabitats, irrespective of their age class (except in situations posing a risk to public safety). • Broadening of the knowledge of species diversity of fungi through the development of scientific research and the creation of a regularly updated mycological database of the Białowieża Forest. • Creation of ex situ gene banks and pure cultures of fungal species.
Animal species	<ul style="list-style-type: none"> • Reduction or elimination of fencing of forest plantations, in justified cases using only fences made of perches. • In areas with active protective measures permitted, supporting tree species which recover poorly in the Forest or are underrepresented due to their past discrimination, such as elm, linden, maple. • Ensuring protection of beetles by preserving generational continuity of tree clusters in the vicinity of confirmed locations of the species (and between them), which in the long term can be colonized by subsequent generations of beetles. • Within the scope of the measures implemented in Zone 4a and 4b, reduction of tree surgery treatments for hollow trees growing outside of dense forests, near human settlements, (pruning of dying parts, filling of cavities, etc.); each time before deciding on maintenance treatments, taking an inventory of protected species (indicated in the expert report) and conducting an assessment of threats posed to the species by the planned maintenance treatments. • Minimization of the threat of protected saproxylic species falling into bark beetle traps by abandoning the use of non-selective slit traps, funnel traps, etc.; in the case of bark beetle trapping, use of pipe traps (e.g., Borregaard pipes for the European spruce bark beetle). • Implementation of measures to improve connectivity of animal populations, including, for example, the lynx of the Białowieża Forest with neighboring populations.
Water resources	<ul style="list-style-type: none"> • Ensuring the proper condition of aquatic and water-dependent ecosystems through the implementation of projects affecting the slowing down or stopping of the deterioration of those ecosystems in zones 2-4 of the Site, including: <ul style="list-style-type: none"> – conducting individual and local technical works based on nature-friendly solutions consisting in the introduction of measures which can raise the ordinates of the bottoms of the

¹⁴ Individual more than 100-year-old trees can be found in each of the zones. According to the accepted definition, in order for a tree stand to be considered more than 100 years old, at least one tree species with at least 10% share must reach an age of more than 100 years.

Reference		Recommendations
		<p>watercourses while maintaining the longitudinal continuity of their continuum (e.g., construction of rapids, reconstruction/declogging of dams), which as a result should allow to reduce the draining role of watercourses in relation to groundwater, and in the long term affect the shortening of water shortage periods in the rivers flowing through the Białowieża Forest;</p> <ul style="list-style-type: none"> – restoration of marshy buffer zones, limitation of de-silting to local activities, restoration of riverbeds, provided that modeling studies are carried out to determine the risks and likelihood of the effectiveness of the measures in terms of the need to improve water resources; – introduction of measures to increase landscape retention (including relocation, appropriate placement of tree debris resulting in local reduction of surface runoff), which should improve infiltration conditions and slow down surface runoff. Local material, such as lying tree trunks, should be used to carry out the aforementioned tasks. <ul style="list-style-type: none"> • Conducting maintenance works in accordance with <i>Katalog Dobrych Praktyk Robót Hydrotechnicznych i Prac Utrzymawczych</i> [Catalogue of Good Practices for Hydraulic Works and Maintenance Works] (KDP; Biedroń et al., 2018) in zones 2-4 of the Site, in particular limiting of works consisting in sectional de-silting and complete mowing of vegetation. • Incorporation in forest management plans of tasks aimed at restoration of the local drainage retention within the boundaries of the drainless depressions, and development of the rules for carrying out renaturalization activities when updating nature conservation plans. • Restoration of flow regimes characteristic of lowland rivers with the focus on restoration of periodic flooding of river valleys. • Development of the hydrological and hydrogeological monitoring system, including: <ul style="list-style-type: none"> – installation of sensors and taking continuous measurements of water levels in rivers flowing through the Białowieża Forest; – expansion and integration of groundwater monitoring conducted by the Białowieża National Park and in the areas of the Regional Directorate of State Forests in Białystok; – commencement of hydrological monitoring of groundwater and reference watercourses, located outside the impact range of the measures introduced to improve the quantitative and qualitative state of the water resources of the Białowieża Forest in order to allow full evaluation of the effects of the introduced measures; – conducting regular (every few years) comprehensive analyses of changes in plant ranges and river hydromorphology in order to collect reference data allowing to objectively assess the changes taking place.
Barrier on the Polish-Belarusian border	Measures to support the lynx population	<ul style="list-style-type: none"> • Until animal crossings are opened, the introduction of additional facilities should be considered to allow animals to cross the barrier (e.g., additional properly secured openings of a size appropriate for a lynx or wolf) with a diameter of about 30 cm. • Limiting hunting only to invasive alien species will allow, among

Reference		Recommendations
		<p>others, to ensure high hunting success for predators.</p> <ul style="list-style-type: none"> • Monitoring of the status of ungulate mammal populations to allow responding in advance to a decrease in the availability of lynx prey. • Discontinuation of the use of new fencing and elimination of existing fencing made of forest net serving to protect forest regeneration. • Protection of the natural diversity of the forest structure, including: <ul style="list-style-type: none"> – dead, fallen trees, – the natural, diverse age structure of tree stands, • Regular (annual) monitoring of populations of large carnivores (using trail cameras and/or tracking on snow). • Conducting research on the impact of the barrier on the spatial organization of the population and the survival rate of lynx, as well as the possibility of crossing the border zone (in swampy sections where the permanent barrier is replaced by concertina wire).
	Measures related to invasive plant species	<ul style="list-style-type: none"> • Removal of additional barriers (forest net fencing and razor wire entanglements located along the main barrier). • Regular control and mechanical removal (by pulling out together with the root mass) of invasive plant species from the border zone by the forest service (forest districts: Białowieża, Hajnówka and Browsk) and the Białowieża National Park. • Inventory of plants on transects along the border up to 50 m into the forest to detect invasive species early and prevent their further spread, and to monitor the effectiveness of the measures introduced to remove them. • Prohibition of the use of chemicals (such as glyphosate) for plant control.
	Measures related to the risk of disease transmission by medium-sized predators	<ul style="list-style-type: none"> • Prohibition of feeding (wild and domestic) animals by uniformed services and control of its observance. • Equipping border military posts with lockable containers to effectively secure food waste against access by animals and ensuring that they are emptied regularly. • Issuing orders to uniformed services requiring them to strictly observe sanitary regimes while serving in the border zone. • Education of uniformed services about the Site and the rules of staying within its area.
	Measures to reduce noise and light pollution related to the barrier	<ul style="list-style-type: none"> • No permanent lighting of the border zone. If ad hoc illumination of the barrier is required, the lighting should be activated temporarily, using motion sensors, preferably combined with automatic human-animal differentiation systems, which would activate the lighting only when people are detected. • Reduction of vehicle traffic along the border road and all forest roads, especially at night, to the necessary minimum. • Restriction of the accessibility of certain sections of forest roads within the Site. • Selection of road sections, irrelevant from the perspective of operations of border services and maintenance of the site, for possible decommissioning (leaving them without maintenance to be succeeded naturally).

Reference	Recommendations
	<ul style="list-style-type: none"> • Establishment or designation of an entity responsible for planning and conducting of monitoring, as well as data analysis and interpretation. • Securing of an adequate amount in the State budget to cover the cost of monitoring. • Establishment of permanent trail camera monitoring points throughout the Site, based on models developed by the Mammal Research Institute at the Polish Academy of Sciences and the Białowieża Geobotanical Station of the University of Warsaw, providing reliable reference material. • Drawing up a detailed monitoring plan, which should ensure data collection to allow long-term tracking of indicators of the population status of various animal species (rare and endangered species, such as lynx, European bison, elk, as well as common species, such as deer, fox, raccoon dog): relative frequency of occurrence, sex and age structure, presence of reproducing individuals, survival rate, mortality factors, genetic diversity. • Collection of data on animals appearing in the border zone and in the immediate vicinity of the barrier, and attempting to cross or otherwise use the barrier. Collecting such data on an ongoing basis would ultimately allow to minimize the impact of the barrier on the fauna within the Site. Such monitoring is not easy to organize, but it could be carried out in cooperation with the relevant agencies which operate border video surveillance and therefore also collect significant amounts of biological data. • Establishment of a central register and monitoring of mortality rates of rare and endangered mammal species to analyze the cause of their death. Tissues of dead animals (possibly feces or hair found by regional agencies) should be deposited in the tissue bank(s) to control the genetic status of individuals and later to assess the genetic diversity of the population. • Regular inventories of invasive plant species in the border zone.
Forest fire protection and fire prevention plan	<ul style="list-style-type: none"> • Educational activities aimed at making the local community and tourists aware of the fire hazard in the Białowieża Forest and popularization of the rules of safe use of the forest. • Long-term monitoring of fire hazard at the Site taking into account the occurring climate changes and their impact on the decay of spruce stands (dead wood, grass cover). • Due to safety of rescue teams on fire department access routes, it is allowed to fall dead trees in a strip of 50 m from the fire department access route (in zones 1-3 and 4c leaving them on the ground, and in zones 4a and 4b with the possibility of removal), and to mow grass cover in a strip of 2 m along fire department access routes. • In close proximity to power lines, it is recommended to fall dead trees (leaving them on the ground) in zones 2 - 3, and in zone 4 to fall (leaving them on the ground) or remove the trees, depending on the needs, and to consider the possibility of laying power transmission lines underground. • In a strip of up to 50 m along public roads, forest roads allowed for public traffic, hiking trails and elements of tourist infrastructure, according to the risk assessment procedure used by the Site Managers, it is allowed to fall dead trees (leaving them on the ground) in zones 1-3 and 4c, and in zone 4a and 4b, also to remove them due to safety reasons.

Reference	Recommendations
	<ul style="list-style-type: none"> • Implementation of measures which take into account local conditions in terms of small-scale water retention, which may, to some extent, locally reduce fire hazard. • The use of chemical extinguishing agents should be limited only to biodegradable agents and those necessary to extinguish a fire which is difficult to extinguish with water, such as subsurface fires (sapric, peat), lying logs.

Table 7. Summary of expert recommendations (recommendations which are not legal requirements) for the sustainable use of the Site, its buffer zone and the wider surroundings.

Reference	Recommendations
Spatial development plans	<ul style="list-style-type: none"> • Update or adoption of new spatial policy documents of the municipalities of the Białowieża Forest, taking into account the Białowieża Forest Site and other environmentally valuable areas, including determination of the rules of conducting activity and management within those areas. • Taking into account the presence of valuable natural areas, protected species and the need to preserve the continuity of local ecological corridors in the development of local spatial development plans of municipalities. • Ensuring protection of open areas from investments, maintenance of their natural character and preservation of agricultural functions in the vicinity of the Białowieża Forest Site using planning documents. • Stopping of development which limits the ecological connectivity of the Białowieża Forest with its surroundings (in the localities of Istok, Orzeszkowo, Pasieczniki Duże) by establishing the ranges of permissible development in the local plans. • Stopping of extensive development of recreational buildings (in excess of the provisions of studies in the locality of Topiło) by precisely defining the zoning in the local plans. • Adjustment of the size of land allocated for development to the results of the analysis of the demographic situation, including demographic forecasts (balance of land allocated for development); • Revision of areas planned for recreational development, in terms of ensuring the ecological connectivity of the Białowieża Forest with its surroundings. • Revision of documents concerning the agricultural and non-agricultural use of agricultural land in terms of preservation the current composition and configuration (precise definition of areas for possible afforestation, abandonment of drainage improvement and intensification of use and the associated removal of individual trees and bushes). • Introduction or maintenance of a ban on the construction of wind farms (irrespective of other legal considerations) and when determining the location of photovoltaic farms, taking into account their barrier role in the movement of large and medium-sized

Reference	Recommendations
	<p>mammals, as well as limitation of the availability of natural habitats for the occurrence and feeding of plant and animal species.</p> <ul style="list-style-type: none"> • Promotion of the preservation of the characteristics of traditional wooden buildings of the Białowieża Forest region in the local spatial development plans of municipalities. • Consideration of historical and archaeological sites in the Białowieża Forest region in the existing and newly developed local spatial development plans of municipalities in order to preserve and protect those sites.
Landscape protection	<ul style="list-style-type: none"> • Ensuring protection of the traditional landscape of the Białowieża, Masiewo, Pogorzelce glades and the agrocenoses (Pogorzelce, Budy, Budy Leśne, Teremiski, Stare Masiewo) through the revitalization and maintenance of viewpoints and scenic tracts in the foreground of the park. • Promotion of traditional architecture. • Popularization of traditional cultivation forms consisting in extensive use of grasslands. • Introduction of new development in the Białowieża Glade only as a complement to the existing settlement arrangement. • Ensuring the protection of the cultural heritage of the Palace Park and the Directorate Park in Białowieża through their revitalization. • Ensuring the protection of aesthetic and cultural values of historical monuments (in localities: Białowieża, Narewka, Stoczek, Eliaszki, Michnówka, Lewkowo Stare, Lewkowo Nowe, Pasieki, Siemianówka) through adequate development of the surroundings; strict adherence to conservation recommendations, appropriate local planning and application of proper urban and architectural standards.
Agriculture	<ul style="list-style-type: none"> • It is recommended to consider developing a new paradigm of agriculture in the municipalities of the Białowieża Forest, consider the introduction of a model of "conservative agriculture" to protect the landscape of the villages of Pogorzelce, Budy, Budy Leśne, Nowe Masiewo, Stare Masiewo and Teremiski. Such a model would involve farming according to traditional methods and introduction of systemic solutions to promote such farming and its products, including through financial instruments. • Conducting assessments of agricultural policy instruments (localities of Kapitańszczyzna, Ochrymy, Podlewkowie, Planta) in terms of their effectiveness for the protection of herbaceous communities, and adaptation of those instruments to the results of the assessment so that they prevent the decline of herbaceous vegetation.
Tourism	<ul style="list-style-type: none"> • Development of a consistent system to manage and control tourist traffic in the Białowieża Forest region; development of the concept of "Gates to the Białowieża Forest" as tourist resorts (localities) with a tourist service center "Main Gate to the Białowieża Forest" and the World Heritage Site Center. • Development of a concept of tourist routes with one or more main trails forming a clear axis of the entire region, along with complementary trails in hitherto less popular parts of the Białowieża Forest and its surroundings. • Initiation and support of the establishment of tourist and

Reference	Recommendations
	<p>educational attractions and the development of sustainable forms of specialized and active tourism in the buffer zone and the wider surroundings of the Site, e.g., a bicycle path, provided that the investment is carried out in accordance with applicable regulations and with respect for existing forms of nature conservation¹⁵.</p> <ul style="list-style-type: none">• Mapping and valuation of ecosystem services provided by the Site to local communities and the general public.

¹⁵ In carrying out this type of tasks, it is necessary to consider item 172 of the Operational Guidelines, according to which: The World Heritage Committee invites states-parties to the Convention to inform the Committee, through the Secretariat, of their intention to undertake or approve major renovation work or new construction projects in an area protected under the Convention which may affect the Outstanding Universal Value of the given site. Notification should be given as soon as possible (for example, before the basic documents for specific projects are drawn up) and before any decisions are taken which would be difficult to undo, so that the Committee can help find suitable solutions to ensure full protection of the outstanding universal value of the site.

6. Management instruments

6.1 Measures coordination system

The aim of the management system is to ensure effective protection of the Białowieża Forest for present and future generations. The management should guarantee that the OUV of the Białowieża Forest is maintained and strengthened.

The system is based on strict cooperation between land managers, local authorities and other stakeholders. The coordination of the *Plan's* implementation is managed by the Management Plenipotentiary for the Białowieża Forest Site, who cooperates with the Director of the Białowieża National Park, the managers of the Hajnówka, Białowieża and Browsk Forest Districts, as well as the Steering Committee and the Scientific and Social Council. The Plenipotentiary begins their work at the time of their appointment by the Minister competent for the environment. The following diagram presents the management structure of the Site (Fig. 9) and the entities responsible for the implementation of the *Plan* (Fig. 10).

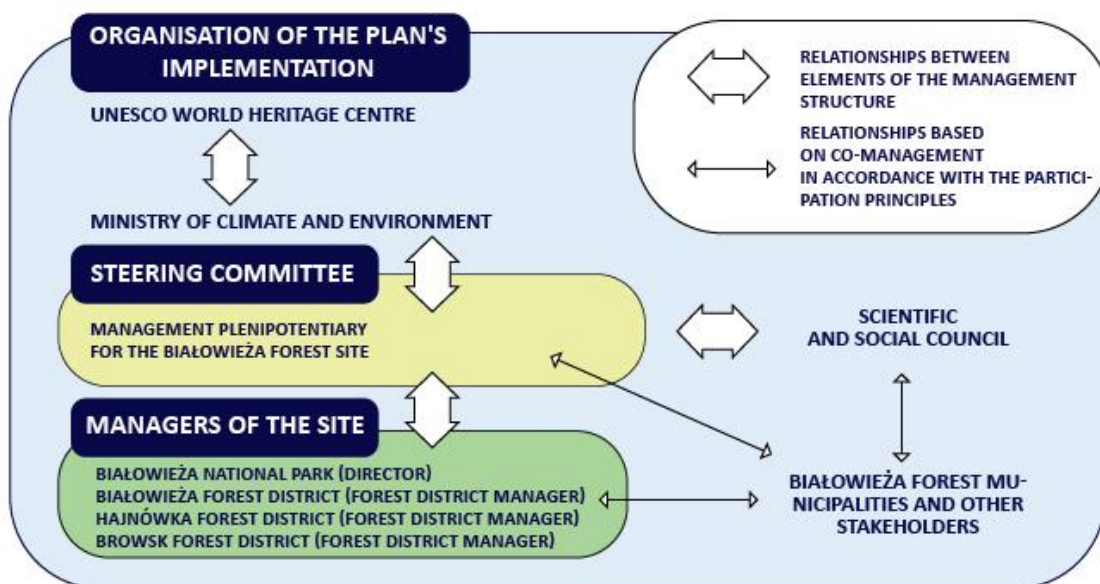


Fig. 9. Management structure of the Białowieża Forest Site



Fig. 10. Entities responsible for the implementation of the Plan

Steering Committee

A consultative and advisory team, appointed by the Minister competent for the environment after approval of the *Management Plan*, composed of:

- The Management Plenipotentiary for the Białowieża Forest Site (hereinafter Plenipotentiary),
- Director of the Białowieża National Park,
- Director of the Regional Directorate of State Forests in Białystok,
- Director of the Department competent for environment protection at the Ministry competent for the environment,
- Director of the Department competent for forestry at the Ministry competent for the environment,
- Representative of the Polish National Commission for UNESCO.
- Director of the Regional Directorate for Environmental Protection in Białystok
- General Director for Environmental Protection
- Representative of the Ministry competent for culture

The scope of activities of the Steering Committee (hereinafter SC) includes, in particular:

- control over the implementation of the *Plan*, evaluation and acceptance of reports on the *Plan's* implementation,
- decision-making in crisis situations.

Management Plenipotentiary for the Białowieża Forest Site

Appointed by the Minister competent for the environment, the Management Plenipotentiary for the Białowieża Forest Site coordinates the implementation of the *Plan*.

The scope of the Plenipotentiary's activities includes, in particular:

- coordination of the implementation of the Białowieża Forest *Management Plan*,
- preparation of reports for competent authorities and institutions in Poland and UNESCO bodies,
- ongoing monitoring and coordination of cooperation between managers and other stakeholders in mutual contacts and in contacts with international organizations, environmental authorities and institutions in Poland and abroad,
- supporting the development of plans and strategies for the Białowieża Forest in cooperation with local government units,
- participation in works aimed at developing and building public awareness of the Białowieża Forest brand and related promotional activities (such as promotion and communication strategies, licenses, educational activities),
- cooperation with the business and its environment, strengthening the proper maintenance or enhancement of the outstanding universal value of the Białowieża Forest,
- monitoring of the availability of funding from various sources for ongoing initiatives related to the Białowieża Forest, including for its stakeholders,
- taking measures to promote the resolution of disputes through mediation, without infringing on the competence of the bodies competent to resolve them,

- providing information about the Białowieża Forest and consultations concerning the Site,
- conducting dialogue with international institutions and organizations and other countries on matters related to the Białowieża Forest,
- support of the crisis management system within the scope of available resources and means (development of procedures to integrate the Management Plenipotentiary for the Białowieża Forest Site into the local crisis management system, directed at collecting, documenting and communicating information)
- development of a protection plan for the Białowieża Forest in case of an armed conflict and emergency situations for the entire area of the entry,
- taking measures to establish a consistent system to protect the ecological processes and biodiversity at the Site, including the preparation of draft amendments to existing national laws towards improvement of the Site management, and supporting the development of tools for the management of natural World Heritage sites at international level,
- taking steps to promote cross-border cooperation, including steps to establish a management committee or a similar body together with the Belarusian side to manage the entire Białowieża Forest (if the geopolitical situation allows it).

Scientific and Social Council of the Białowieża Forest Site

The Scientific and Social Council is a consultative and advisory body to the Management Plenipotentiary for the Białowieża Forest Site with regard to the protection of the Outstanding Universal Value of the Property and the implementation of the *Management Plan*, composed of (up to 21 persons):

- Heads of the municipalities Białowieża, Hajnówka, Narewka, Narew, Dubicze Cerkiewne and Mayor or the town of Hajnówka,
- Governor of the Hajnówka district council,
- 3 representatives of NGOs with national reach,
- 2 representatives of local NGOs,
- 4 representatives of science - among others, representatives of scientific institutions located in the Białowieża Forest (e.g. the Geobotanical Station of the University of Warsaw, the Mammal Research Institute of the Polish Academy of Sciences, the Forest Research Institute, Białystok University of Technology) and scientists conducting research in the Białowieża Forest.
- 1 representative of the Regional Directorate for Environmental Protection in Białystok,
- 1 representative of the National Institute of Cultural Heritage,
- 1 representative of the Polish National Commission for UNESCO,
- Provincial Border Guard Commander,
- 1 representative of the Polish Army.

The Council is appointed by the Minister competent for the environment for a five-year term, from among candidates presented by the Site Management Plenipotentiary. The competences of the Council shall be defined in the appointment act. The Scientific and Social Council of the Białowieża Forest Site cooperates with the Scientific Council of the BNP, the Scientific and Social Council of the “Białowieża Forest” Promotional Forest Complex and the Scientific Council of the Belovezhskaya Pushcha National Park (Belarus).

6.2 Legal instruments

The legal framework for the area of the Białowieża Forest is set forth in the Convention concerning the protection of the world cultural and natural heritage adopted in Paris on 16 November 1972 by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) at its seventeenth session (Journal of Laws 1976 32 item 190). It is supplemented by provisions of the Polish law, which specify the responsibilities of Site Managers and local governments in protecting and managing that area. The objectives and measures aimed at conservation or sustainable management of the Białowieża Forest area must simultaneously protect the Outstanding Universal Value of the Białowieża Forest. The provisions of the *Management Plan*, that is the objectives, measures and recommendations, should be included in and be consistent with all documents concerning the Site.

Measures introduced by Site Managers

The legal framework for the measures introduced in the Białowieża Forest area is determined by, among others:

- Act of September 28, 1991 on forests (consolidated text Journal of Laws of 2025, item 567),
- the Act of October 13, 1995 Hunting Law (consolidated text Journal of Laws of 2025, item 539),
- Act of April 27, 2001 Environmental Law (consolidated text Journal of Laws of 2024, item 54),
- Act of April 16, 2004 on nature conservation (consolidated text Journal of Laws of 2024, item 1478),
- the Act of April 13, 2007 on preventing and remedying environmental damage (consolidated text Journal of Laws of 2020, item 2187),
- the Act of October 3, 2008 on the provision of information on the environment and its protection, public participation in environment protection, and environmental impact assessments (consolidated text Journal of Laws of 2024, item 1112),
- the Act of July 20, 2017 Water Law (consolidated text Journal of Laws of 2024, item 1087),
- the Act of September 11, 2021 on alien species (consolidated text Journal of Laws of 2023, item 1589).

The aforementioned laws are implemented with regard to the Site through legal instruments - conservation plans and forest management plans.

Conservation plans

In accordance with the provisions of the Conservation Act, conservation plans are developed for national parks, reserves, landscape parks and Natura 2000 areas. Their content should be consistent with both the requirements of that act and the assumptions of this *Plan*, which ensures consistency of the measures implemented throughout the area, among others:

- the objectives of conservation measures indicated in the conservation plan must be consistent with those indicated in the *Management Plan*, and must allow to preserve, for present and future generations, the globally unique forest ecosystem, intact ecological processes and the biodiversity created by them (chapter 4.2),

- the threats and barriers, as identified in the *Management Plan* (chapters 3.1 and 3.2), to the preservation of the proper conservation status of natural habitats and species of plants and animals and their habitats should be reflected in the documents prepared,
- the proposed methods for minimizing those threats should be consistent with the measures and recommendations included in Chapter 5,
- conservation plans should include the elements specified in Chapter 7 concerning monitoring as a tool for data acquisition aimed at organization of effective protection of species and ecological systems.

In addition, conservation plans should include detailed conservation guidelines to be incorporated into spatial development plans. Their content should also include results of a landscape audit, in accordance with the requirements of the Spatial Planning and Land Development Act.

At present, within the area of the Białowieża Forest conservation plans have been adopted for the Białowieża National Park (effective 2015-2034) and for parts of the reserves. In the absence of such plans, the Regional Directorate for Environmental Protection (RDOŚ) determines conservation tasks by way of an order. However, some reserves have neither conservation plans nor conservation tasks. Currently, a conservation task plan is also being implemented in the Natura 2000 area Białowieża Forest PLC 200004, to be replaced by a conservation plan in the future.

Forest management plans

Each ds. district should have a forest management plan (PUL) approved by the minister competent for the environment. Forest management plans define all management measures, including forest management, nature conservation and assessment of the amount of timber which can be harvested. An integral part of a forest management plan is a nature conservation program, which includes a broad description of the condition of nature and its protection, as well as conservation tasks and methods. Similarly to nature conservation plans, the aforementioned elements should be consistent with the provisions of this *Plan*, in particular, the measures introduced within the scope of active protection as well as the conservation tasks and methods should include the provisions in the above-mentioned chapters. Guidelines for forest management plans:

- afforestation is allowed only in designated areas of Zone 4b,
- conservation programs created as part of forest management plans must comply with the guidelines for each zone of the Site (the guidelines are described in chapter 6.4),
- tasks such as timber harvesting (as a side effect of ongoing conservation activities), support of natural regeneration, forest care and protection, technical infrastructure needs must be carried out in accordance with the principles adopted in the *Management Plan*, i.e., be consistent with the indicated measures and meet the requirements of the zone in which they are planned,
- the objectives and principles of active protection must correspond to those indicated in the *Management Plan*.

Strengthening of border security

Matters of border security within the territory of Poland are regulated by:

- Act of October 12, 1990 on the protection of the state border (consolidated text Journal of Laws of 2025, item 184),
- Act of October 12, 1990 on the Border Guard (consolidated text Journal of Laws of 2024, item 915),
- the Act of October 29, 2021 on the construction of state border security (consolidated text Journal of Laws of 2023, item 1390).

The Act of October 12, 1990 on the protection of the state border regulates matters related to the location, protection and control of the border of the Republic of Poland. The Act of October 12, 1990 on the Border Guard defines the organization, tasks and authorizations of the Border Guard as a formation established to protect the state border and to control border traffic. The Act of October 29, 2021 on the construction of state border security reinforces the importance of infrastructural solutions in managing border protection in the face of threats such as the migration crisis.

Given the exceptional importance of the Site, it is necessary to pursue security objectives with respect for the unique character of the Białowieża Forest, and in the process of border protection, to ensure:

- the use of solutions which minimize interference with the Site's OUV, that is monitoring of border security with the help of non-invasive solutions,
- the exercise of caution when monitoring the security of the Site's boundaries,
- conducting of trainings on how to responsibly navigate the area of the Site and use alternative routes where possible,
- cooperation with institutions responsible for the Białowieża Forest, in order to better understand and adapt operations to conservation requirements.

Measures introduced by local governments

Pursuant to the Nature Conservation Act, the head of a municipality, the mayor of a town or president of a city, and the district governor act as authorities competent for nature conservation. The legal framework for measures introduced by local governments is defined by three laws:

- the Act of March 8, 1990 on municipal government (consolidated text Journal of Laws of 2024, item 1465),
- the Act of June 5, 1998 on district government (consolidated text Journal of Laws of 2024, item 107),
- The Act of June 5, 1998 on provincial government (consolidated text Journal of Laws of 2025, item 581).

The aforementioned legal acts regulate, among others, the matters of formulation of development policies, strategies, plans and programs developed by local governments.

A special role in the management in the buffer zone and the wider surroundings of the Site has the spatial planning system regulated by the Act of March 27, 2003 on spatial planning and land development (consolidated text Journal of Laws of 2024, item 1130), according to which:

- the competences of the provincial government bodies include the drawing up of a provincial spatial development plan, as well as a landscape audit indicating the locations and boundaries of sites inscribed on the UNESCO World Heritage lists, areas of the UNESCO Network of Biosphere Reserves (MaB), the results of which are particularly important in the context of protecting the landscape of the Białowieża Forest,
- tasks of the municipality include the adoption of a general plan and local spatial development plans. In the absence of a local spatial development plan, land use and development conditions are determined by means of a decision on land development conditions.

A recent amendment to the act introduced key changes in the preparation of planning documents. A study of land use conditions and directions was replaced by a general plan, which received the status of a local law. The general plan has an superior role with regard to local spatial development plans (MPZP), which means that its findings are binding both in the adoption of MPZPs and in the issuance of decisions on land development conditions, thus limiting development to the areas indicated in the general plan. Municipalities must adopt general plans by 30 June 2026, based on local and supra-local development strategies. According to the provisions of the act, spatial planning and development shall primarily take into account the requirements of spatial order, landscape values and environmental protection. For municipalities located within the Property, general plans should take into account the provisions of this *Plan* (including expert recommendations).

Measures in the event of a natural disaster

The legal framework for measures in the event of natural disasters is provided, among others, by:

- Act of September 24, 1991 on fire protection (consolidated text Journal of Laws of 2025, item 188),
- Act of April 18, 2002 on a state of emergency (consolidated text Journal of Laws of 2025, item 112),
- Act of April 26, 2007 on crisis management (consolidated text Journal of Laws of 2023, item 122),
- Act of December 5, 2024 on protection of civilians and civil defense (Journal of Laws 2024, item 1907).

The main natural threats to the Białowieża Forest Site are strong winds and fires. According to the provisions of the *Renomination Proposal*, strong wind can be considered a natural disaster, but also part of natural processes.

The basic document governing fire protection is the *Fire protection and forest fire extinguishing plan for the Polish part of the Białowieża Forest Transboundary World Heritage Site* (Annex 7). The indicated document is based on applicable national standards and regulations in the area of fire protection and forest fire protection.

In the forest districts of the Białowieża Forest, the matters of forest fire protection are also addressed in *Forest management plans* and *Procedures in the event of forest fire*. In the Białowieża National Park, those are the *Conservation Plan* and *Procedures in the event of forest fire for the forest areas of the Reserve conservation section*.

Based on an analysis conducted for the purposes of the *Fire protection plan*, 138 fires occurred in the Białowieża Forest in the years 2000-2024 over an area of 51.20 hectares. The main cause of most fires was anthropogenic impact. An analysis of the fire hazard for the Białowieża Forest, taking into account changes occurring in its area primarily as a result of spruce dwining due to the European spruce bark beetle gradation, showed an increase in potential risk, especially in the years 2016 - 2018 (Annex 7). Since 2020, the rate of tree stand decay has decreased significantly, and the decomposition of small parts and the emergence of natural regeneration in cleared areas have resulted in a decrease in fire hazard, although in exposed areas covered with grasses, raspberries or ferns that hazard still occurs before the start of vegetation or during prolonged droughts. It is estimated that around 2029, fire hazard in the Forest may return to the level before the European spruce bark beetle gradation, unless there are other unexpected disturbances (Annex 7).

The appointed Management Plenipotentiary for the Białowieża Forest Site should support the crisis management agencies and authorities in individual crisis management stages. The Plenipotentiary should also be notified by the Managers, crisis management agencies and authorities, as well as other stakeholders about threats which have occurred or may occur with regard to the Site. An appropriate procedure within the framework of the existing system, which will allow the Plenipotentiary to collect and document information, should be developed within one year of adoption of the *Plan*.

6.3 Financial instruments

Securing of effective funding is a prerequisite for implementation of measures to preserve the Outstanding Universal Value of the Białowieża Forest. At present, conservation measures within the area of the Site and its management are financed from the funds of the individual Managers - the Białowieża National Park and the State Forests National Forest Holding, as well as from national and European funds at the disposal of the Regional Directorate for Environmental Protection in Białystok.

The implementation cost of the measures identified in the *Plan* was evaluated based on the method of evaluation by analogy and the method of evaluating the cost of individual activities, depending on the availability of data. The calculations were conducted using data obtained on the basis of market research, consultations with experts, data of Statistics Poland and the *Guidelines for the application of uniform macroeconomic indicators* published by the Ministry of Finance. The estimates take into account, among others, labor intensity, costs of investments related to the establishment of the World Heritage Site Center, costs of expert reports and studies.

The long-term nature of the measures identified in the *Plan* leads to uncertainty as to their scope and the amount of expenditure needed to implement them. For this reason, the indicated costs should be considered estimates. It is estimated that the implementation of the measures included in the Plan in the period until 2030 will amount to about PLN 61 million, and may require expenditures of about PLN 46 million in the years 2031-2035. The most expensive part of the *Plan* is the implementation of the measures within the scope *Objective 2 Protection of biodiversity at all levels (ecosystem, species and genetic level) and its essential habitats*. The objective includes estimated costs to be incurred by the Managers in connection with the implementation of the Białowieża National Park Conservation Plan as well as estimated costs related to the implementation of nature

conservation plans for the Natura 2000 area Białowieża Forest PLC 200004 (outside the BNP area) and reserves.

The implementation of the *Plan* will continue to be financed from the funds of the individual Managers - the Białowieża National Park and the State Forests National Forest Holding, as well as from national and European funds at the disposal of the Regional Directorate for Environmental Protection in Białystok.

The implementation of the *Plan* also requires additional financial resources. There are plans to create a fund of the Plenipotentiary for the Białowieża Forest Site, which will cover the costs of management operations. It is estimated that by 2035 the total expenditure for the activities of the Plenipotentiary will amount to about PLN 9.5 million. In addition, the planned investment in the development of educational infrastructure in the form of the World Heritage Site Center located in the Białowieża Forest, is estimated to be about PLN 4 million.

The estimates presented in the *Plan* should be verified at the stage of development of detailed project specifications, since preliminary cost estimates, in particular in the case of strategies and plans covering a significant time horizon, are subject to a significant level of uncertainty.

The list of potential funding sources presented in the table (table 8) is open-ended, other additional sources may be found in the future, or the current ones may be exhausted or closed. Information on programs and competitions should be verified.

Table 8. Potential funding sources for the measures identified in the *Plan*

Type	Source name	Description
PRIMARY	Budget of the Management Plenipotentiary for the Białowieża Forest Site	<ul style="list-style-type: none"> Funds set aside as a special purpose reserve, for activities related to the performance of the tasks of the Management Plenipotentiary for the Białowieża Forest Site, included in the <i>Plan</i>
	Budget of the Białowieża National Park,	<ul style="list-style-type: none"> Funds for activities related to, among others, the implementation of the Białowieża National Park Conservation Plan
	Budget of State Forests National Forest Holding	<ul style="list-style-type: none"> Funds allocated for active protection, for example as part of the Forest Fund
	Budget of the Regional Directorate for Environmental Protection in Białystok	<ul style="list-style-type: none"> Funds for activities related to, among others, the implementation of conservation plans and conservation task plans in the Natura 2000 area Białowieża Forest (outside the BNP), nature conservation plans for the Białowieża Forest reserves
	Funds of other entities responsible for the implementation of the measures provided for in the <i>Plan</i> , including those obtained by local government units as part of subventions from the state budget (the Act of October 1, 2024 on	<ul style="list-style-type: none"> Funds of responsible entities, assigned to individual measures, primarily intended to cover labor costs of employees, funds for the fulfillment of environmental needs arising from the presence of protected areas

Type	Source name	Description
	revenues of local government units)	
EXTERNAL	European Union funds	<ul style="list-style-type: none"> Regional Operational Program of the Podlaskie Province European Funds for Eastern Poland 2021-2027 Interreg Europe 2021-2027 National Reconstruction Plan
	National Fund for Environmental Protection and Water Management	<ul style="list-style-type: none"> Funds allocated for activities related to environmental education, biodiversity and landscape diversity, as well as education of public administration personnel and dissemination of knowledge about the climate
	Provincial Fund for Environmental Protection and Water Management in Białystok	<ul style="list-style-type: none"> Funds for environmental education activities within the framework of the Regional Support Program for Environmental Education, protection of biodiversity and ecosystem functions, counteracting and eliminating environmental hazards
	National Science Center, National Center for Research and Development	<ul style="list-style-type: none"> Funds obtainable through competitions for basic research projects related to the Site and connected with the implementation of research and development projects
	Horizon Europe	<ul style="list-style-type: none"> Funds obtainable through competitions for large-scale implementation projects, e.g., innovative solutions in the area of preservation, restoration and regeneration of ecosystems, especially in degraded areas
	LIFE Program	<ul style="list-style-type: none"> Funds for activities related to the implementation of Community environmental law and policies as well as the identification and promotion of new solutions to environmental and climate problems

6.4 Zoning

The zoning of the Site is primarily intended to support the preservation of its Outstanding Universal Value. The each of the separate zones, measures adequate for the specifics of the given area have been determined, to preserve the OUV now and in the future. The criteria of division into individual zones were approved when the Site was inscribed on the World Heritage List. They also result from expert recommendations presented in the report on the UNESCO/IUCN Monitoring Mission in 2024. The document recommends, among others, the division of Zone 4 into subzones.

The Site has been divided as follows (Annex 9):

- Zone 1, i.e. the strict protection zone,
- Zone 2, i.e. the partial protection zone I,
- Zone 3, i.e. the partial protection zone II,
- Zone 4 divided into subzones:

- 4a: active protection of species and habitats,
- 4b: active conversion of tree stands,
- 4c: natural regeneration of tree stands.

Methodology for the development of zoning adjustments

Zoning is based on the latest, thoroughly analyzed ecological data and substantive criteria for designation of protection areas. The proposed zoning is integrated with the recommendations of UNESCO/IUCN experts and the assumptions of the draft Conservation Plan of the Natura 2000 area "Białowieża Forest". The basis for the development of zoning adjustments is spatial data containing a description of separated tree stands (Forest Data Bank; Bureau for Forest Management and Geodesy) as well as spatial data containing information on protection zones of selected species, made available by the RDOŚ in Białystok. The developed zoning adjustment is based on the methodological assumptions proposed by Michał Żmihorski, PhD. The characteristics of the areas included in individual zones are presented in the following table (Table 9).

Table 9. Rules for assigning Białowieża Forest areas to individual zones

Zone		Areas located within the zone
Zone 1, i.e. the strict protection zone,		<ul style="list-style-type: none"> • Strict protection zone of the Białowieża National Park
Zone 2, i.e. the partial protection zone I		<ul style="list-style-type: none"> • Nature reserves; • Part of the Białowieża National Park not covered by the strict protection zone (except for the Bison Show and Breeding Reserve)
Zone 3, i.e. the partial protection zone II		<ul style="list-style-type: none"> • Tree stands of 100 years and older - understood as stands in which at least one tree species with a share of at least 10% has reached an age of more than 100 years (Annex no. 8); • Pioneer tree stands, that is stands with dominant birch and aspen (making up more than 50% of the stand) older than 60 years, • Other forests which do not require conversion, with species composition is compatible with the habitat, • Zones for the protection of lesser spotted eagle, black stork and Lobaria pulmonaria (due to the failure of the RDOŚ in Białystok to designate a zone for the protection of boreal owl, such areas were not included), • Passive protection areas according to the draft of the Natura 2000 Conservation Plan
Zone 4	4a: subzone for active protection of species and habitats,	<ul style="list-style-type: none"> • Non-forest areas (technical areas related to the maintenance and availability of the Site, such as power lines), • Active protection areas according to the draft of the Natura 2000 Conservation Plan, • Bison Show and Breeding Reserve (due to the specificity of the activities carried out in those areas), • Cultural areas not located within zone 2, • 15 m wide border strip (due to the current geopolitical situation)
	4b: subzone for active conversion of tree stands,	<ul style="list-style-type: none"> • Tree stands in which the share of coniferous trees (pine, spruce) is > 50%, growing in forest habitats (forest, mixed forest, alder forest), aged less than 100 years (tree stands, in degraded habitats)

	4c: subzone for natural regeneration of tree stands	<ul style="list-style-type: none"> Tree stands in which the share of coniferous trees (pine, spruce) is > 80%, growing in mixed forest habitats, aged less than 100 years (tree stands, in degraded habitats)
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A buffer zone is maintained around the Site, within the boundaries specified in the Renomination Application.

The zoning of the Site, except for zones 1 and 2 and the border strip, was developed in a 100 x 100 m grid. The area of the grid mesh (field) is therefore 1 hectare. This approach is intended to prevent excessive fragmentation. The adopted grid size allows to reflect the diversity of individual areas of the Białowieża Forest, and at the same time is an area larger than the area of a number of separated forest plots. A grid with a larger mesh would not allow to reflect the diverse ecosystems of the Białowieża Forest. However, the adopted grid does not define zone boundaries with geodetic accuracy. Specific ecosystems may extend slightly beyond the boundaries of a given grid mesh (due to the adopted methodology for the development of the updated zoning) - in such cases, those areas should be considered jointly.

According to the presented rules, the area of individual zones is:

- Zone 1: 6 066.64 hectares (10.74%);
- Zone 2: 15 986.20 hectares (28.29%);
- Zone 3: 32 321.60 hectares (57.20%);
- Zone 4a: 1 826.19 hectares (3.23%);
- Zone 4b: 85.87 hectares (0.15%);
- Zone 4c: 216.12 hectares (0.38%);

It should be noted that the area of the Białowieża Forest Site has not changed as result of the development of this Plan. Differences in data, for some sources, result from, among others, the use of different cartographic reference systems and the correction of the course of the Site boundaries on the State border (adjustment of the boundaries to the State Border Register). In addition, a slight reduction in the area of Zone 1 and Zone 2 is related to the separation of a 15-meter-wide border strip, which is due to the current geopolitical situation and the related overriding regulations (e.g., the Act of October 12, 1990 on the protection of the state border, Journal of Laws 2025.184 consolidated text).

Measures permitted in individual zones

As stated above, rules for the functioning of individual zones have been defined, concerning permitted activities and certain restrictions. They should contribute to the preservation of the OUV now and in the future. The information presented below is supplemented by a description of the permitted conservation measures included in the catalog attached as Annex no. 6 to the *Plan*.

Zone 1. Strict protection

According to the definition, the principle of strict protection is to leave a specific area completely in the power of natural forces, with no possibility of direct human interference (Table 10). Strict protection allows free, undisturbed occurrence of ecological processes and changes in the species composition and the structure of forest communities as a result of the natural development of tree

stands and succession processes. Research and education activities in that zone is performed in accordance with the rules of scientific exploration in the Białowieża National Park. Only maintenance of existing roads is allowed. Entry to this most valuable zone is possible only when accompanied by a licensed guide (Table 10). An exception is granted for persons conducting scientific research or carrying out work for the Białowieża National Park. In such cases, it is possible to stay in Zone 1 without a guide. However, this requires a consent issued by the Director of the Białowieża National Park.

Zone 2. Partial protection I

In the area of Zone 2 it is allowed to pick mushrooms, berries and herbs (as long as this is allowed by the regulations of the respective reserve, national park and no restriction is applicable based on the Act of April 16, 2004 on nature conservation) for individual purposes and carry out recreational activities (Table 10). As in Zone 1, road maintenance is also allowed. Research and educational activities are allowed in the area, but they must be carried out in accordance with the rules established for individual reserves. The rules of Zone 2 set forth in this document do not change the provisions of the binding plans for the protection of the Białowieża National Park and nature reserves. However, recommendations resulting from the *Management Plan* should be taken into account when updating those documents.

Zone 3. Partial protection II

In this zone, it is allowed to pick berries, mushrooms and herbs (unless it is restricted based on the Act on nature conservation) and to carry out recreational and educational activities. Public access is limited only in species protection zones (Table 10). In this zone, hunting and countermeasures are possible only for invasive alien species.

Zone 4a. for active protection of species and habitats

In this area, active measures are necessary to protect species and habitats or landscapes. Permitted activities include timber harvesting (as a side effect of ongoing conservation activities), berry, mushroom and herb picking (unless respective restrictions are imposed based on the Act on nature conservation), as well as recreation, research and education (Table 10). Hunting and countermeasures are possible only for invasive alien species. In this area, there are no public access restrictions. Exceptions are the Bison Show Reserve and the Breeding Reserve. In those areas, the rules specified in separate regulations apply. An important exception is also the border strip. Restrictions on access to the area closest to the border result from overriding regulations and depend primarily on the current geopolitical situation.

Zone 4 for active conversion of tree stands

Timber harvesting (as a side effect of ongoing conservation activities), berry, mushroom and herb picking (unless respective restrictions are imposed based on the Act on nature conservation), recreation, research and educational activities are allowed in the area (Table 10). Access for the public is not restricted. Hunting and countermeasures are possible only for invasive alien species.

Zone 4c for natural regeneration of tree stands

Timber harvesting is prohibited within the subzone. There are not restrictions for picking of berries, mushrooms and herbs (unless respective restrictions are imposed based on the Act on nature conservation), recreational activities or educational and research activities (Table 10). Public access to the areas of the aforementioned zone is not subject to any restrictions. Hunting and countermeasures are possible only for invasive alien species.

Buffer zone including forest habitats¹⁶ (area outside the Białowieża Forest Site)

Management of the area, with the exception of the military part, is regulated by the Act of March 27, 2003 on spatial planning and land development (consolidated text Journal of Laws 2024 item 1130) and the relevant spatial development plans drawn up pursuant to it, as indicated in chapter 6.2. In this zone, picking mushrooms, berries and herbs is allowed (unless respective restrictions are imposed based on the Act on nature conservation), as well as recreation, hunting, logging (only as a side effect related to, for example, conservation activities), research and education. However, it is not allowed to build new roads (Table 10).

Buffer zone outside the forest (area outside the Białowieża Forest Site)

The functioning and management of the area is regulated by the Act of March 27, 2003 on spatial planning and land development (consolidated text Journal of Laws 2024 item 1130) and the relevant spatial development plans drawn up pursuant to it, as indicated in chapter 6.2. In the buffer zone outside the forest, just like in the buffer zone covering forest habitats, no additional restrictions on use have been imposed (Table 10). Road construction is also permitted, in accordance with local spatial development plans. Privately owned forest areas are also included in this part of the buffer zone, in accordance with the renomination application (2014).

¹⁶ The restrictions on the buffer zone apply only to the area specified in the renomination application, i.e. the part of the Białowieża Forest managed by the Hajnówka Forest District, located around Hajnówka, which is not part of the World Heritage Site.

Table 10. Measures permitted in individual zones

Zone		Description of the zone	Timber harvesting	Hunting	Picking of berries, mushrooms and herbs	Recreational activities	Public access	Road construction	Other
Zones within the Białowieża Forest Site									
1		Strict protection	Not permitted	Not permitted	Not permitted	Not permitted	Restricted	Not permitted, maintenance permitted	Restricted research and education
2		Partial protection I	Not permitted	Not permitted	Permitted**	Permitted	Restricted	Not permitted, maintenance permitted	Restricted research and education, removal of alien species, maintenance of open habitats
3		Partial protection II	Not permitted	Hunting and countermeasures possible for invasive alien species.	Permitted**	Permitted	Restricted	Not permitted, maintenance permitted	Research and education permitted
4	4a	Active protection of species and habitats	Permitted*	Hunting and countermeasures possible for invasive alien species.	Permitted**	Permitted	Permitted	Not permitted, maintenance permitted	Research and education permitted
	4b	Active conversion of tree stands,	Permitted*	Hunting and countermeasures possible for invasive alien species.	Permitted**	Permitted	Permitted	Not permitted, maintenance permitted	Research and education permitted
	4c	Natural regeneration of tree stands,	Not permitted	Hunting and countermeasures possible for invasive alien species.	Permitted**	Permitted	Permitted	Not permitted, maintenance permitted	Research and education permitted

Zone	Description of the zone	Timber harvesting	Hunting	Picking of berries, mushrooms and herbs	Recreational activities	Public access	Road construction	Other
Buffer zone (area outside the Białowieża Forest Site)								
Buffer zone ***	Forest areas	Permitted*	Permitted	Permitted**	Permitted	Permitted	Not permitted, maintenance permitted	Research and education permitted
	Areas outside the forest	Permitted	Permitted	Permitted**	Permitted	Permitted	Permitted in accordance with local spatial development plans	Research and education permitted; Development in accordance with local spatial development plans

*Timber harvesting is allowed only as a side effect of ongoing conservation activities.

** Picking berries, mushrooms and herbs is allowed as long as Polish law does not impose restrictions in that regard.

*** The restrictions on the buffer zone, resulting from the Plan, apply only to the area specified in the renomination application, i.e. the part of the Białowieża Forest located around Hajnówka, managed by the Hajnówka Forest District, which is not part of the World Heritage Site

7. Monitoring

7.1 Long-term monitoring program

One of the key challenges identified during the works on the *Plan* is the lack of a consistent monitoring program for the Site to comprehensively assess the effectiveness of the management. This is considered a barrier to achievement of the objective of permanent preservation of the Site (chapter 3.2).

In response to this challenge, the need to implement measure 1.3.1 should be emphasized, the purpose of which is to develop and implement a monitoring program for the Białowieża Forest Site, taking into account all the factors identified in its description. A key element in achieving the objectives of this measure is the cooperation of all entities responsible for its implementation as well as collaborating entities. In addition, important assumptions for effective monitoring are included in measures 4.1.1 and 5.4.1. Also, recommendations for the protection of the OUV can be found in the expert report on the impact of the barrier on the Polish-Belarusian border on the Białowieża Forest World Heritage Site, as presented in chapter 5.2.

Regular collection of data on the condition of the environment, concerning both abiotic and biotic elements, including the features of the Site as specified in the Declaration of the OUV as well as other factors indicated above, requires the establishment of an entity responsible for planning and conducting of monitoring as well as data analysis and interpretation. The multi-year monitoring program for the Białowieża Forest provides for systematic collection and analysis of data on key indicators such as climate change, tourist pressure, species migration and habitat fragmentation, among others. It is necessary to designate permanent research plots, such as trail camera monitoring points, distributed throughout the Site, thus providing reliable reference material. Monitoring of tourist pressure should also include systematic estimation of the number of visitors and identification of the main routes and areas with increased traffic, which will allow to assess the impact of tourism on the fragile ecosystems of the Białowieża Forest. In the area of research on species migration, modern technologies such as GPS devices and photo traps should be used to map migration corridors and identify barriers affecting the movement of animals between parts of habitats. Analysis of habitat fragmentation, performed with the use of GIS systems and satellite imagery, allows to assess landscape changes, indicating areas where environment degradation leads to population isolation and loss of biodiversity. Emphasis should be placed on measures aimed at improvement of wildlife management based on the latest research results. An example is a new scientific assessment of the ecological carrying capacity of European bison, red deer or lynx.

Thanks to the multi-year program, decisions on the management of the Białowieża Forest will be made on the basis of up-to-date and comprehensive data, which will contribute to better protection of the unique ecosystems and allow to implement corrective measures adapted to changing environmental conditions.

7.2 Supervision of the implementation of the Plan

An important element of adaptive management to oversee the effectiveness of the implemented measures and monitoring results is the evaluation system of the objectives and measures indicated in the *Management Plan*.

Evaluation indicators have been assigned to management objectives, taking into account both measure directions and individual measures. The evaluation system for the implementation and execution of the Plan is consistent with the management structure for the implementation of the *Plan* (chapter 6.1). The Management Plenipotentiary for the Białowieża Forest Site plays the key role in coordination of that process. The Plenipotentiary's tasks include data collection, coordination of cooperation between entities providing information, and preparation of evaluation reports (chapter 6.1). Those reports will be developed on the basis of monitoring indicators (table 11).

In the process of supervising the implementation of the Management Plan, it is also recommended to use international tools to facilitate evaluation of management effectiveness. Especially useful can be the guidebook "Enhancing Our Heritage. Toolkit 2.0. Assessing management effectiveness of World Heritage properties and other heritage places", issued in 2024 by UNESCO (United Nations Educational, Scientific and Cultural Organization), ICCROM (International Centre for the Study of the Preservation and Conservation of Cultural Heritage), ICOMOS (International Council for the Conservation of Monuments and Historic Sites), IUCN (International Union for Conservation of Nature) and the National Institute of Cultural Heritage. The publication offers a set of 12 tools to self-assess the effectiveness of the management of heritage sites, identify the strengths and weaknesses of the management system and indicate areas for improvement. Toolkit 2.0 can be particularly helpful in preparation of evaluation reports, review or updates of the Management Plan, as well as in the process of adaptive management of the Site.

Schedule

The first year after the adoption of the *Management Plan* will be devoted to development of an organizational structure and the rules for collecting information and data (including measure 1.3.1). Many of the measures provided for in the *Plan* will be implemented in cooperation with various groups of stakeholders, and the Plenipotentiary will serve as a coordinator for the collection of data from various sources. The planned Białowieża Forest World Heritage Site Centre (measure 7.2.1) should offer organizational and technical facilities for collecting and processing data necessary for monitoring and evaluation of the implementation of the *Plan*.

The first evaluation report on the implementation and realization of the *Plan's* objectives should be prepared 3 years after its adoption. A key element of the report will be to indicate which measures, planned as one-time measures, have already been implemented (indicators are summarized in table 11, with one-time measures highlighted). After the implementation of those measures, it will be possible to replace indicators for one-time measures with new ones, related to further measures as resulting from the development of, for example, strategies, plans, expert opinions, guidelines, etc.

Table 11. Monitoring indicators for the *Plan*

Proposed indicators	Data sources	Comment
Objective 1. Preservation of undisturbed ecological processes		
Ensuring passive protection of ecological processes within the Białowieża Forest Site	Managers of the Site	Share of the area under strict protection and passive protection in the total area of the Site
Development of the document Rules of Scientific Exploration within the area of the entire Site	Scientific and Social Council of the Site, Scientific Council of the Białowieża National Park, Scientific and Social Council of the Białowieża Forest Promotional Forest Complex Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (Rules of Scientific Exploration have been developed YES, NO)
Number of scientific projects reviewed in accordance with the developed rules of scientific exploration/year	Scientific and Social Council of the Site, Scientific Council of the Białowieża National Park, Scientific and Social Council of the Białowieża Forest Promotional Forest Complex, Management Plenipotentiary for the Białowieża Forest Site	Data sources depend on the location of the planned research
Development of a monitoring program for the Białowieża Forest Site	Scientific and Social Council of the Site, Scientific Council of the Białowieża National Park, Scientific and Social Council of the Białowieża Forest Promotional Forest Complex, Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the program has been developed YES, NO)
Objective 2. Protection of biodiversity at all levels (ecosystem, species and genetic level) and its essential habitats		
Percentage of nature conservation forms functioning within the Site with updated nature conservation plans	Managers of the various nature conservation forms	The value of the indicator should be 100%
Number of newly developed management documents reviewed for compliance with Poland's obligations under Polish and international law and ensuring protection of the Outstanding Universal Value of the Białowieża Forest.	Scientific and Social Council of the Site Management Plenipotentiary for the Białowieża Forest Site	Size of the indicator depending indirectly on the number of management documents developed / updated
Development of a plan of measures for the protection of water resources in the Białowieża Forest	Scientific and Social Council of the Site Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the <i>Plan</i> has been developed YES, NO)
Development of a plan for the protection of wild pollinators	Scientific and Social Council of the Site Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the <i>Plan</i> has been developed YES, NO)

Proposed indicators	Data sources	Comment
Objective 3. Preservation of the integrity of the Site as a whole		
Number of proposed amendments to national legislation, ensuring the effectiveness of the Plenipotentiary's actions in matters concerning the Site.	Minister competent for the environment	The indicator should be monitored in the first 2 years, after this period the competences of the Plenipotentiary should already be fully established in the national law
Percentage of nature conservation plans and forest management plans with nature conservation programs which incorporate the objectives and indicators of the <i>Management Plan</i>	Białowieża National Park Białowieża, Browsk and Hajnówka Forest Districts, Regional Directorate for Environment Protection in Białystok	
Development of guidelines indicating methods to minimize or completely reduce the impact of existing and planned barriers contributing to fragmentation and isolation of habitats within the area of the Site	Scientific and Social Council of the Site, Scientific Council of the Białowieża National Park, Scientific and Social Council of the Białowieża Forest Promotional Forest Complex, Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the guidelines have been developed YES, NO) In subsequent years of the <i>Plan's</i> implementation, this indicator may be replaced by the following indicator: Number of implemented guidelines
Development and publication of guidelines for the designation, protection and proper functioning of ecological corridors within the area of the Site	Scientific and Social Council of the Site, Scientific Council of the Białowieża National Park, Scientific and Social Council of the Białowieża Forest Promotional Forest Complex, Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the guidelines have been developed YES, NO)
Number of spatial planning documents which incorporate the assumptions and indicators of the <i>Management Plan</i> of the Site	Local governments	
Number of educational and promotional materials developed, discussing the need to create and preserve diverse natural structures	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the Site managers	
Number of educational and informational activities focusing on the need to create and preserve diverse natural structures	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the Site managers	The indicator should be generated annually
Objective 4. Promotion of and support for the cooperation between of international, national and local actors		
Development of a program of a transparent and participatory cooperation, together with key stakeholders	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	One-time indicator (the program has been developed YES, NO).
Development of a financial support mechanism for initiatives involving cooperation for the benefit of the Site	Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the mechanism has been developed YES, NO). In subsequent years, this indicator should be replaced by the indicator Number of initiatives/projects supported financially within the scope of the developed support mechanism

Proposed indicators	Data sources	Comment
Number of seminars (conferences) to strengthen cooperation and sharing of experience in terms of cooperation between local and national institutions and international actors	Management Plenipotentiary for the Białowieża Forest Site	The indicator should specify periodic seminars (conferences)
Establishment (appointment) of a forum for the Białowieża Forest	Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the forum has been established YES, NO). In subsequent years, this indicator should be replaced by the indicator Number of initiatives implemented at the forum.
Objective 5. Creation of conditions for sustainable development of the Białowieża Forest municipalities		
Development of rules for sustainable use of the resources of the Białowieża Forest resulting from protection regimes binding within the Site	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	One-time indicator (the rules have been developed YES, NO).
Number of educational and promotional materials with the most important information about sustainable use of the area of the Site, including permissible uses of the Site, as well as compensation for losses incurred due to the presence of protected areas and objects in the Białowieża Forest as well as benefits offered by the Site <i>as an additional indicator</i> : Number of people and entities which have used the consultancy on the use of the Białowieża Forest resources	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	
Number of prepared applications for funds for projects aimed at socio-economic development of municipalities and environmental protection	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	
Development of an integrated strategy for sustainable development of Białowieża Forest municipalities	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	One-time indicator (the strategy has been developed YES, NO). In subsequent years, this indicator should be replaced by the indicator Number of recommendations resulting from the strategy implemented in local programming documents
Development of a supra-local tourism development strategy for the area of the Białowieża Forest	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	One-time indicator (the strategy has been developed YES, NO). In subsequent years, this indicator should be replaced by the indicator Number of projects / initiatives implemented based on the strategy
Number of intergenerational workshops offered by various educational and cultural entities	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the	

Proposed indicators	Data sources	Comment
based on topics related to the cultural heritage of the Białowieża Forest region	stakeholders	
Number of recipients of trainings for public administration and other entities applying the public procurement law on the possibility of using green and social clauses	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	
Objective 6. Strengthening of the identity and pride of local communities on the basis of knowledge of the natural, cultural and historical values of the Białowieża Forest		
Number of measures identifying and documenting the local tangible and intangible heritage of the Białowieża Forest	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the scientific community, craftsmen and folk artists	
Number of recipients of the measures promoting the cultural heritage of the Białowieża Forest	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	
Number of educational materials and information on cultural heritage sites and intangible heritage within the Białowieża Forest area	Management Plenipotentiary for the Białowieża Forest Site in cooperation with cultural and educational institutions as well as stakeholders implementing measures related to the cultural heritage	
Number of trainings (and number of participants of those trainings) on public participation in decision-making	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	
Number of measures/initiatives (or recipients of the measures/initiatives) promoting economic activity, including tourism, in the region of the Site	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	
Number of informational and promotional measures concerning local products which support the protection of the Site	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	
Establishment of an award for an entrepreneur supporting the protection and promotion of the Site	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the stakeholders	One-time indicator (the award has been established YES, NO). In subsequent years, this indicator should be replaced by the indicator Number of winners (divided into economic sectors)
Percentage of schools in the Białowieża Forest region implementing education about protection objectives of the Białowieża Forest's world heritage in their curricula	Podlaskie Education Board Management Plenipotentiary for the Białowieża Forest Site	
Objective 7. Provision of environmental and cultural education and promotion of the World Heritage Site		
Development of a strategy of environmental and cultural education in the context of the	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the	One-time indicator (the strategy has been developed YES, NO). In subsequent years, this indicator

Proposed indicators	Data sources	Comment
World Heritage protection objectives, including the Białowieża Forest	stakeholders	should be replaced by the following indicators: Number of educational materials (in various forms and used in different educational schemes) to broaden and supplement knowledge on the protection of world heritage, including in particular the Białowieża Forest
Establishment of the Białowieża Forest World Heritage Site Centre	Management Plenipotentiary for the Białowieża Forest Site	One-time indicator (the Centre has been established YES, NO). In subsequent years, this indicator should be replaced by the following indicators: Number of entities cooperating with the Centre; Forms of sharing knowledge resources about the Białowieża Forest (including resources available in the OpenData formula); Number of conducted surveys of knowledge and awareness of World Heritage Sites; Number of popular science publications about World Heritage Sites
Number of trainings (and number of participants) for public administration employees about the Site	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local government units	
Setting up of an educational path within the Site presenting the Outstanding Universal Value and criteria for inscription on the World Heritage List	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the Białowieża National Park, Białowieża, Browsk and Hajnówka Forest Districts and local governments	One-time indicator (the educational path has been created YES, NO). In subsequent years, this indicator should be replaced by the following indicator: Number of guides and educators using the educational path
Objective 8. Use of the outstanding value of the World Heritage Site to promote the Białowieża Forest region		
Development of visual identification for Białowieża Forest municipalities	Management Plenipotentiary for the Białowieża Forest Site in cooperation with the local governments	One-time indicator (the visual identification has been developed YES, NO). In subsequent years, this indicator should be replaced by the following indicators: Number of facilities marked with visual identification signs; Number of initiatives / measures to promote the Białowieża Forest region using visual identification

In subsequent years, evaluation reports on the implementation of the *Management Plan* will be prepared every three years. The Plenipotentiary will submit them to the Scientific and Social Council of the Site, and after receiving a positive opinion, the reports will be disseminated.

An important element will be to ensure that the results of the evaluation are disseminated as widely as possible, and to allow discussion with various stakeholder groups about possible changes to the *Plan* resulting from monitoring, evaluation or other circumstances. The forum planned for the Białowieża Forest (measure 3.1.2) can be used for that purpose.

After 10 years of implementation of the *Management Plan*, an *on-going* evaluation should be conducted to answer questions and draw conclusions:

- To what extent are the objectives and measures included in the *Plan* pertinent and relevant to the changes which have occurred in the Site and its environment?
- How do different stakeholder groups evaluate the effectiveness of the implementation of the objectives and measures included in the *Plan*?
- Is the consistency and alignment of the *Plan's* content with other documents related to nature conservation and strategic documents ensured, especially those developed after the adoption of the *Plan*?
- Have new previously undiagnosed threats and barriers to the management of the Site emerged which the *Plan* does not address?
- Has the international situation changed, and if so, is there a possibility of international cooperation with Belarus?

Apart from an independent group of experts, the Management Plenipotentiary for the Białowieża Forest Site and a representative of the expert team developing the *Management Plan* should participate in the works on the evaluation report. In the year in which the evaluation is conducted, its results will be disseminated as part of the Plenipotentiary's report. This approach will allow to take into account the specifics of the document and the management system of the Site in the process of adaptive management.

8. Literature and materials used

8.1 Literature

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Portal of European Funds <https://www.funduszeuropejskie.gov.pl>

Białystok District <https://samorzad.gov.pl/web/powiat-bialostocki>

Hajnówka district <https://samorząd.gov.pl/web/powiat-hajnowski>

Regional Directorate of State Forests in Białystok <https://www.bialystok.lasy.gov.pl/>

Regional Directorate for Environmental Protection in Białystok <https://www.gov.pl/web/rdos-bialystok/regionalna-dyrekcja-ochrony-srodowiska-w-bialymstoku>

The International Union for Conservation of Nature <https://www.iucn.org/>

Office of the Marshal of Podlaskie Province https://bip.wrotapodlasia.pl/wojewodztwo/urząd_mar/

World Heritage Convention <https://whc.unesco.org/>

9. List of tables and figures

9.1 List of tables

Table 1. Map of the <i>Plan's</i> stakeholders	17
Table 2. Contribution of the Białowieża Forest Site to local communities (own compilation based on Vasseur and Siron 2019).....	35
Table 3. Categories of protection forests in the forest districts of the Białowieża Forest.....	43
Table 4. Threats to the Białowieża Forest.....	50
Table 5. Management barriers for the Białowieża Forest.....	56
Table 6. List of expert recommendations for the preservation of the Outstanding Universal Value of the Site	118
Table 7. Summary of expert recommendations (recommendations which are not legal requirements) for the sustainable use of the Site, its buffer zone and the wider surroundings.....	124
Table 8. Potential funding sources for the measures identified in the <i>Plan</i>	135
Table 9. Rules for assigning Białowieża Forest areas to individual zones	137
Table 10. Measures permitted in individual zones	141
Table 11. Monitoring indicators for the <i>Plan</i>	145

9.2 List of figures

Fig. 1. Schematic of the adaptive management approach developed based on EU Guidelines on climate change and Natura 2000 (European Commission, 2013).....	14
Fig. 2. The process of the Plan development: stages, objectives, methods, results.....	16
Fig. 3. Location of the Białowieża Forest transboundary site (own compilation based on data from GUGiK, BPN, OpenStreetMap)	21
Fig. 4. Location of nature conservation forms of the national system of protected areas (KSOCh) in relation to the Białowieża Forest Site (own compilation based on GDOŚ data).....	37
Fig. 5. Location of Natura 2000 areas in relation to the Białowieża Forest Site (own compilation based on GDOŚ data).....	40
Fig. 6. Assessment of the impact of threats on the Outstanding Universal Value.....	54
Fig. 7. Assessment of the importance (weight) of the barrier to the Site management	58
Fig. 8. Site Management objectives	61
Fig. 9. Management structure of the Białowieża Forest Site	127
Fig. 10. Entities responsible for the implementation of the Plan	127

10. List of annexes

- Annex 1 – Statement of Outstanding Universal Value of the Białowieża Forest property - Original text
- Annex 2 - List of persons, members of the IOŚ-PIB Project Team and a list of expert opinions prepared for the purposes of the Management Plan of the Białowieża Forest World Heritage Site Management Plan (Polish part)
- Annex 3 - List of workshops for stakeholders concerning the provisions of the Białowieża Forest World Heritage Site Management Plan (Polish part)
- Annex 4 - Matrix of threats and measures
- Annex 5 - Matrix of barriers and measures
- Annex 6 - Catalogue of protective measures in individual zones of the Site
- Annex 7 - Forest fire protection and firefighting plan for the Polish part of the Białowieża Forest Transboundary World Heritage Site
- Annex 8 – Map of over 100-year-old tree stands in the Białowieża Forest
- Annex 9 – Zoning of the Białowieża Forest Site
- Annex 10 – Location of the thermophilous oak forest in the Białowieża Forest Site

11. Glossary

The glossary of terms has been developed to ensure a uniform and complete understanding of the content of the Białowieża Forest *Management Plan*. It offers a support tool for the proper interpretation of the terms irrespective of the professional profile or education of the recipient.

The Management Plan document covers a wide range of issues, which makes it necessary to use specialized terminology. This glossary aims to standardize the understanding of the terms used and to eliminate possible ambiguities in their interpretation.

The glossary has been developed to ensure consistency and transparency of the document and to facilitate its implementation and use by all stakeholders involved in the protection and use of the resources of the Białowieża Forest.

Agrocenosis	A complex of plant and animal organisms interacting with each other, formed as a result of human agricultural activity.
Active management	Refers to the deliberate introduction of measures to maintain, improve or optimize the functioning of ecosystems, forestry, agriculture or other land use.
Anthropophyte	A plant species alien to the natural flora of a given area.
Attributes	Aspects of the site related to or expressing the Outstanding Universal Value. Attributes can be tangible or intangible. For natural objects, the term "features" is more commonly used. Examples of attributes for natural objects may include: visual or aesthetic significance, range of physical features or natural habitats, integrity of physical or ecological processes, naturalness and integrity of natural systems, vitality, rarity.
Management barriers	Elements of the management system which make it difficult or impossible to achieve the objective of preservation of the Property, they refer to the organizational framework, (legislative and financial) implementation instruments, cooperation with stakeholders, as well as the legal and political environment. The definition has been adopted for the purposes of development of the <i>Management Plan</i> , taking into account the approach expressed in the UNESCO Operational Guidelines and referring to the IUCN approach - criteria for the evaluation of World Heritage Sites.
Biogen	An organic substance necessary for plant and animal growth.
Rooting	Disturbance of the ground by wild boars in search of food, such as insects and larvae. Rooting is important for forest management and the entire ecosystem. It loosens the soil, allowing many plants to germinate, and accelerates the circulation of matter.
Tree surgery	A field of knowledge involving the treatment of wounds, as well as repairing cavities in the trunks of trees attacked by fungi by forming of wounds and allowing water to drain from the wound surface; it also includes maintenance treatments consisting in arboriculture treatments, crown pruning, replanting older of trees, etc., aimed at increasing the vitality and prolonging the life of old trees.
Thinning cut	Pruning of trees of various sizes to ensure the initiation of regeneration and growth and also to maintain older trees and preserve the vertical compactness of the tree stand.
Concertina	Blade wire entanglements in the form of a double loop.
Abiotic factor	Impact of inanimate matter, such as temperature, humidity, atmospheric oxygen.
Biotic factor	Impact of animate matter, living organisms.
Anthropogenic factor	Impact as a result of human activity or due to human involvement.
Declaration of the Outstanding Universal Value	A description, prepared by the State Party, of the Outstanding Universal Value of a site, adopted by the World Heritage Committee when a site is inscribed on the World Heritage List. The declaration is intended to provide a clear, shared understanding of

	the reasons for inscribing the site on the List and what needs to be managed to preserve the Outstanding Universal Value in the long term. The declaration is the basis for future protection and management of the site.
Tree stand	A group of trees with a specific species composition, age, structure and dependence on habitat conditions, growing close to one another and affecting one another. Depending on their origin, distinguished are natural tree stands, formed spontaneously without human intervention, and artificial tree stands, created by sowing or planting. In terms of the age of the trees, they are divided into single-aged and different-aged tree stands. Tree stands play a key role in the structure and functioning of the forest ecosystem.
Intangible heritage	Practices, perceptions, messages, knowledge and skills - as well as the associated instruments, objects, artifacts and cultural space - which communities, groups and in some cases, individuals recognize as part of their own cultural heritage. That intangible cultural heritage, passed over from generation to generation, is constantly reproduced by communities and groups in relation to the environment, the impact of nature and their history, and provides them with a sense of identity and continuity, thus contributing to the growth of respect for cultural diversity and human creativity. It is also called "living cultural heritage." Intangible heritage is manifested through, among others: oral traditions and storytelling, including language as a medium of intangible heritage; performing arts and musical traditions; customs, rituals and ceremonies; knowledge and practices concerning nature and the universe; skills related to crafts and traditional professions.
Natural heritage	Includes natural objects consisting of physical and biological formations or groups of such formations, presenting an Outstanding Universal Value from an aesthetic or scientific point of view; geological and physiographic formations and precisely identified areas which provide habitat for endangered animal and plant species of Outstanding Universal Value from the point of view of science or conservation; natural objects or precisely identified natural areas of Outstanding Universal Value from the point of view of science, conservation or natural beauty.
Edge effect	Interaction of two habitats in their area where they meet.
Entomofauna	All species of insects living in a given area or environment.
Eutrophication	The process of enrichment of water reservoirs with nutrients, causing excessive growth of algae.
Phenology	Dependencies between the timing of periodic phenomena in the life of organisms and seasonal changes in weather and climate, and the science which studies those dependencies.
Fluctuation	Irregular variation in the severity of a process or phenomenon.
Nature conservation forms	Forms of nature conservation established under the Nature Conservation Act, such as national parks, nature reserves, landscape parks, protected landscape areas, Natura 2000 areas, usable ecological areas, documentary sites, nature monuments and species protection.
Invasive species	Alien species the introduction or spread of which threatens the local biodiversity or affects it in an undesirable way.
Alien species	Individuals of a species, subspecies or a lower taxon of animals, plants, fungi or microorganisms introduced outside its natural range; the term includes any parts, gametes, seeds, eggs or diaspores of those species, as well as hybrids, varieties or races capable of survival and reproduction.
Native species	A species which occurs naturally in a given geographic region or ecosystem, without human involvement in its introduction. Native species are part of local ecosystems.
Saproxyllic species	Invertebrate species associated with dead wood. They include species which require dead wood as habitat or as food (saproxylbionts), as well as species which prefer dead wood (saproxyllophiles). Saproxyllic species live also in aquatic environments (dead wood submerged in water).
Georeferencing	The process of assigning geographic coordinates to objects, maps or images so that

	they can be located on the Earth's surface. This allows, for example, a map scan to be matched to an actual location in the GIS system.
GIS	Geographic Information System, that is an information system used for the input, collection, processing and visualization of spatial data, meaning data with a reference to a location on a map. It allows, for example, mapmaking, land analysis or spatial planning.
Glyphosate	An active substance commonly used in agriculture as a herbicide.
Białowieża Forest municipalities	The municipalities of the Hajnówka district, that is the municipality of Białowieża, the municipality of Hajnówka, the town of Hajnówka, the municipality of Narew, the municipality of Narewka, the municipality of Dubicze Cerkiewne, the municipality of Czeremcha, the municipality of Kleszczele, the municipality of Czyże and the municipality of Michałowo, located in the Białystok district.
Forest management	Active protection of habitats and species through breeding and conservation measures listed as a catalog of measures allowed in specific zones of the Site. It should be noted that in the context of the Białowieża Forest, the purpose of forest management is not timber production or harvesting.
Ectomycorrhizal fungus	A fungus which lives in symbiosis (see: plant symbiont) with the roots of a plant without penetrating the cells of those roots.
Polyporoid fungi	Mushrooms which grown mainly on living or dead wood of trees and shrubs, hence characterized as arboreal fungi. Most species of polyporoid fungi decompose wood, and a large number of them are parasites which attack healthy and weakened trees.
Lichenized fungi	Also known as lichens. A specific group of organisms which developed based on a permanent symbiosis between fungi and algae. Until recently, they were treated in systematics as a separate division <i>Lichenes</i> within the plant kingdom. They are now classified as fungi.
Hybridization	A phenomenon of crossbreeding of species, resulting in cross-species hybrids.
Integrity	Integrity is a measure of the completeness and intactness of natural or cultural heritage and its attributes. Examination of integrity involves assessment to what extent the property: <ul style="list-style-type: none"> a) includes all the elements necessary to express its Outstanding Universal Value; b) is of the right size to provide a full representation of the features and processes which demonstrate its significance; c) is exposed to adverse effects of development or neglect.
Stakeholder	Any person or organization that has or may have impact on the <i>Plan</i> as well as contribute to its success or failure.
Interpretation	Explanation of the site and its value to the public (visitors and residents) based on established, reliable sources of information; includes the full range of potential measures to increase public awareness and improve the understanding of the property.
Natural capital	Real and potential resources, forces, processes and structural elements of nature, as well as the composition and interrelationship between the various components of the environment through which life processes on Earth are sustained. Natural capital includes all forms of ecosystems and natural resources which take part in the creation of human wealth, but are not the product of human labour.
UNESCO Convention	Convention concerning the protection of the world cultural and natural heritage adopted in Paris on 16 November 1972 by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) at its seventeenth session.
Cultural landscape	Space historically shaped as a result of human activity, containing anthropogenic and natural elements. In that space, meanings created and assigned by successive generations are superimposed. Cultural landscape is a spatial record of lasting identification of a given community with a particular area (with the created set of tangible landscape components and intangible values, including ideas, opinions, views, beliefs, historical affiliations, ethnicity, cultivation of

	customs).
Criteria for inscription on the World Heritage List	Ten criteria decisive for the inscription of a site on the World Heritage List. A site can be inscribed on the List if it meets at least one of the ten criteria and also provides proper conditions for integrity and authenticity, and complies with requirements concerning conservation and management. The World Heritage criteria are explained in UNESCO's Operational Guidelines and are regularly reviewed by the World Heritage Committee to reflect the evolution of the World Heritage concept.
Criterion IX	The criterion for inscribing a site on the World Heritage List, according to which the site should provide outstanding examples representative of ongoing ecological and biological processes relevant to the evolution and development of ecosystems as well as terrestrial, freshwater, coastal and marine communities of animals and plants.
Criterion X	The criterion for inscribing a site on the World Heritage List, according to which the site should include the most representative and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.
Boreal forest	A plant formation characteristic of the cool temperate climate zone, consisting of coniferous forests with a poorly developed shrub layer and a well-developed undergrowth layer.
Boreo-nemoral forest	Forest of the transition zone between coniferous boreal forest (that is beyond deciduous forest).
Forest of primary character	A forest complex which is shaped mainly by natural processes and for decades, human activity has not significantly affected the functioning of the ecosystems. The Białowieża Forest exhibits features of a forest of primary character thanks to: the presence of representative ecosystems and forest communities, typical of this part of Europe; the natural composition and distribution of species, the complex vertical structure of tree stands and the mosaic arrangement, consistent with developmental stages; the diversity of tree sizes and ages; and the presence of dead wood (standing or fallen) in various stages of decomposition.
Woody debris	Dead or dying trees which have fallen over as a result of wood decay and loss of mechanical properties.
Dead wood	Trees and their parts and dead parts of living trees. It provides habitat or a food source for numerous species, including saprotrophic fungi, lichenized fungi, saproxylic invertebrates, vertebrates, bryophytes, and herbaceous plants.
Monitoring	The process of observation of the World Heritage site and analysis of the information collected to determine whether the site's condition is improving, stabilizing, or degrading over time or in reaction to a specific event or threat. Monitoring allows the World Heritage Committee to accurately evaluate conditions at the site level and decide on possible measures to guarantee the preservation of the Outstanding Universal Value.
Folivore organism	An organism which feeds on leaves.
Cambivore organism	An organism which feeds on phloem and cambium, that is the vascular tissue and the meristem of plants.
Saprotrophic organism	An organism which feeds on dead organic matter, breaking it down into simpler chemical compounds. Examples include fungi and some bacteria.
Pathogen (pathogenic organism)	An agent which causes disease in a human, animal or plant.
Nature conservation plans	A generalized term covering conservation plans for area-related forms of nature and landscape protection, developed mandatorily based on the Nature Conservation Act, including conservation plans for national parks and reserves, landscape parks, plans of conservation tasks, and conservation tasks. Nature conservation plans are instruments for the implementation of the <i>Management Plan</i> .
Spatial development plans	A generalized concept that which studies of spatial development conditions and directions for municipalities, local spatial development plans, general plans and spatial development plans of provinces.
Participation	Public participation in decision-making, including cooperation between institutions

	and the public and between institutions (e.g., public administration at different levels). Participation also includes collaboration during the implementation of strategies, plans, programs and projects. Participation in the development and implementation of the <i>Management Plan</i> is of key importance, also in the context of the subsequent implementation of management objectives and the long-term approach to the management of the World Heritage Site.
Timber harvesting	Measures aimed at ensuring safety in the area of the Site and active protection of habitats, species and reconstruction of tree stands as allowed in specific zones. In the Białowieża Forest, timber harvesting may only be a by-product of conservation activities. No activities aimed at timber harvesting are carried out in this area.
Relic	A plant or animal species, preserved in a limited, usually small area, a remnant from past climatic periods or geological epochs.
Biodiversity	A term used to collectively describe the diversity and variability of nature, encompassing three basic organization levels of living systems: the genetic, species and ecosystem level. Species of plants, fungi and animals are the most widely recognized units of biodiversity, therefore public efforts are directed mainly at the preservation of species diversity.
Natural habitat	A land or water area, natural or semi-natural, distinguished on the basis of its geographical, abiotic and biotic characteristics.
Hydrogenic habitat	A highly hydrated place with specific flora and fauna adapted to excess water.
Developmental stages of a tree stand	The successive stages which a tree stand (not used economically) goes through during its life, from the moment of its formation until its natural decay. Each of those stages is characterized by specific structural and functional features, affecting biodiversity and ecological processes in the forest ecosystem.
Old-growth forest/ Tree stand of more than one hundred years (100-years) old	A tree stand in which at least one tree species with a share of at least 10% is more than 100 years old.
Buffer zone	A clearly defined area outside the World Heritage Site and adjacent to its boundaries, contributing to the protection, preservation, management, integrity, authenticity and sustainability of the Outstanding Universal Value of the Site. Although buffer zones are not considered part of an inscribed site, their boundaries and suitable management methods should be evaluated, approved and formally recorded when proposed by the State Party. Where buffer zones are defined, they should be considered an integral component of the State Party's commitment to the protection, preservation and management of the World Heritage site. The functions of the buffer zone should reflect the different types and levels of protection, preservation and management required to protect the Outstanding Universal Value of the World Heritage Site.
Zoning	Division of the Site area into zones, adopted for the purpose of its management and approved during the inscription of the Site on the World Heritage List. In the Polish part, the following zones are distinguished: strict protection zone (1), partial protection zone covering part of the national park and nature reserves (2), partial protection zone covering old-growth forests and other forests excluded from economic use (3), active protection zone (4) and buffer zone. The zones differ in their protective regime and the measures allowed in them.
Vertical structure of a tree stand	Height arrangement of the tree stand, taking into account the distinct growth zones. Distinguished are single-zone, two-zone, multi-zone, regenerated, to be regenerated and thinned stands.
Plant symbiont	An organism living in cooperation with a plant, benefiting both parties. It may help the plant take up nutrients, protect it from pests or diseases, and in return receive nutrients from the plant.
Management system	Refers to the <i>Management Plan</i> or other documented management system which must specify how the Outstanding Universal Value of the property should be preserved, preferably through participatory measures. The aim of the management system is to ensure effective protection of the site for present and future

	generations. An effective management system depends on the type, characteristics and needs of the nominated site and its cultural and natural context. Management systems may vary depending on different cultural perspectives, available resources and other factors. They may include traditional practices, existing urban or regional planning instruments, as well as other planning control mechanisms, both formal and informal.
Local identity	A spatial record of the special and distinctive features of the cultural landscape, which shapes not only the space but also the local community. Identity, also called self-awareness, is the identification of residents with the area where they live and function. Local identity is a special case of social (collective) identity which is based on a local tradition related to a clearly determined and defined territory inhabited by a given community. Identity is a record of enduring identification of the community with the area or the landscape.
Transect	A trail set in the forest for measuring purposes, monitoring of natural phenomena and collecting of predictive data.
Sustainable tourism	A type of tourism aimed at minimization of the negative impact of tourist traffic on the environment and local culture, while helping to generate employment opportunities for local residents. Its aim is to provide positive experiences and benefits to local communities, tourism companies and tourists.
Mosaic arrangement of a tree stand	Horizontal arrangement of a tree stand of heterogeneous nature, in which locations of different species and with different characteristics are adjacent to each other.
Ecosystem services	The benefits people derive from ecosystems. They include supply services, such as food and water supply; regulatory services, such as regulation of floods, droughts, land degradation and disease; support services, such as soil formation and nutrient circulation; and cultural services, such as recreational, spiritual, religious and other intangible benefits.
Tree removal	Measures aimed at ensuring safety in the area of the Site and active protection of habitats, species and reconstruction of tree stands as allowed in specific zones. In the Białowieża Forest, timber harvesting may only be a by-product of conservation activities. No activities aimed at timber harvesting are carried out in this area.
Outstanding Universal Value	Cultural or natural significance that is so unique that it transcends national boundaries and is of universal importance to the present and future generations of all mankind.
UNESCO Operational Guidelines	Regulations on the implementation of the UNESCO Convention, included in updated UNESCO documents, describing procedures for, among others, inscription on the World Heritage List as well as protection, management and monitoring of sites. The currently applicable Guidelines are: <i>Operational Guidelines for the Implementation of the World Heritage Convention</i> (WHC.21/01 31 July 2021).
Active protection measures	Breeding and conservation measures listed in the catalogue of measures allowed in specific zones of the Site. Implemented as needed and within the allowed scope as resulting from the need for active management.
Threats	Factors which may cause adverse changes in the physical, chemical or biological characteristics of resources, formations and components of protected nature, landscape values and the course of natural processes, resulting from natural causes or from human activity. They include factors the source of which is within the Property (internal threats) and in its surroundings (external threats), as well as existing and potential threats. Definition based on the Nature Conservation Act, taking into account the approach expressed in the UNESCO Operational Guidelines.
Managers of the area	Institutions required by law to manage the Białowieża Forest area, that is Białowieża National Park, State Forests National Forest Holding (Białowieża Forest District, Hajnówka Forest District, Browsk Forest District). In view of the current geopolitical situation, based on overriding regulations, the Border Guard and the Polish Army decide on activities carried out in parts of the Białowieża Forest,

	particularly in the border strip.
Adaptive management	A flexible approach to the management of natural resources, which takes into account uncertainty and changing environmental conditions. It is based on the <i>learning by doing</i> principle, which means that management decisions are made on the basis of the best information available, and their effectiveness is regularly monitored, analysed and, if necessary, adjusted. Adaptive management is the process of acquiring knowledge about the given area and systematic modeling of that knowledge to identify key management uncertainties, which are then openly explored through the application of management measures, the results of which are used to guide future management.
Climate change	Climate change refers to long-term changes in the average atmospheric conditions on Earth, which may include changes in temperature, precipitation, wind and other elements of the climate. The phenomenon may occur as a result of natural processes or human activity.
Sustainable	Whenever the text of the <i>Plan</i> refers to "sustainable" measures, it indicates the need to maintain natural balance, including the sustainability of basic natural processes, in order to ensure the ability to meet the basic needs of individual communities or citizens of both the present and future generations.
Sustainable development	Development which meets current human needs without compromising the ability of future generations to meet their needs.