

Białowieża Forest: what it used to be, what it is now and what we want it to be in the future

Jerzy Szwagrzyk

University of Agriculture in Kraków, Faculty of Forestry, Department of Forest Biodiversity, Al. 29 Listopada 46, 31–425 Kraków, Poland

Tel. +48 12 6625122, e-mail: rlszwagr@cyf-kr.edu.pl

Abstract. For many centuries, management of the Białowieża Forest has not focused on timber production. Therefore, despite hunting, grazing by domestic animals and sporadic cutting of valuable trees the forest has retained its natural character. After World War I, a small part of the Białowieża Forest was protected as a reserve that later became a national park, while the remainder was managed for timber. After World War II, the protection status of the Polish part of the Białowieża Forest was maintained with the national park at the center surrounded by managed stands.

During the last few decades, the national park was enlarged and new reserves were established. However, the majority of the Białowieża Forest is still managed for timber. The forest management has been sustainable for decades and in the last few years logging has even been strongly reduced, to a level comparable with some national parks.

In recent years the Białowieża Forest, like many areas in Central Europe, has been plagued by a high spruce mortality caused by bark beetles. In managed forests, cutting the infested spruces and removing them from the forest is a standard practice aimed at reducing the growth rate of the bark beetle population. This, however, raises the question of whether we expect the Białowieża Forest to remain a managed forest, in which case the fight against bark beetles would be justified, or whether we want it to be converted into a large national park? In the latter case, cutting trees to fight bark beetles would be inconsistent with the aim of conservation. Recent discussions concerning the Białowieża Forest have been dominated by two different ideologies for nature protection.

The first approach aims at protecting nature to make it sustainable, beautiful and healthy. In the second approach, protecting nature is achieved by removing any direct human influence, even if the resulting natural environment does not meet our expectations.

Keywords: natural processes, nature conservation, old-growth stands variability of silver fir (*Abies alba* Mill.) cones – variability of cone parameters

1. The specifics of the Białowieża Forest

In Polish language, large, extensive forests are used to be called as ‘wilderness’. These forest complexes have shrunk in time, their original stands were cut down and then replanted by foresters but they still retained the name ‘wilderness’. At present, Białowieża Forest is one of the several dozen forests in Poland that are still called by that name (Zaręba 1981). But Białowieża Forest is quite unique amongst them. Also, it’s the most recognisable forest beyond our borders. It’s also more authentic than others, closer to the original meaning of the term ‘wilderness’. Problems with Białowieża Forest are a consequence of its uniqueness.

What decides about the Białowieża Forest’s specificity? Both history and geography. The Białowieża Forest was a royal forest since Jagiełło times (Samojlik 2005). But Niepołomice Forest near Cracow was a royal forest much earlier, already since 13th century (Smólski 1981). The role of geographical location is visible here; royal forest located near then capital of the state, surrounded by densely populated areas, had strong limitations. Limitations concerned its extent and wildness. Niepołomice Forest in Jagiellonans times was not larger than it is presently; villages located on it’s outskirts came into existence in the Middle Ages (Smólski 1981). Its characteristic that a bear for hunting with the king Sigismund the Elder and the Queen Bona presence in

Submitted: 8.08.2016, reviewed: 8.09.2016, accepted after revision: 27.09.2016

1527 had to be brought from the Lithuania. The Białowieża Forest, which was located in the poorly populated area and in terms of economy was completely peripheral, was the back woods of big game, and in time, it has become the last shelter for European bison. Niepołomice Forest lasted to this day as ordinary managed forest. It has a big name and a great tradition but there is very little wildness in it. In Lipówka reserve, in the northern part of Niepołomice Forest, one might have the impression of being in a real primeval forest. Huge oaks and logs of old trees covered with mosses can be found there. But Lipówka reserve covers only 25 ha; one just have to walk 300 m from the middle of the reserve in any direction in order to be in typical managed forest where dead trees are a rarity, whilst in the area of strict protection in Białowieża National Park, one may walk for kilometers through wild forest.

2. What Białowieża Forest used to be?

The Białowieża Forest through the years has managed to preserve its extent and much of its wildness (Paczoski 1930). It doesn't mean that inside were no people within its area; those people were needed for realisation of main goal of royal forests' functioning, which was hunting for big game, European bison in particular. That is why there used to be wardens and hunters in the Białowieża Forest and the whole area was divided into guards (Samojlik 2005). There were also numerous bee-keepers who established forest beehives in the trunks of huge pines. Inhabitants of the Białowieża Forest clearings and villages on the outskirts of the Forest cultivated agriculture and grazed the cattle in the forest, but only in designated areas (Samojlik 2005, Jędrzejewska 2004). Firewood was also collected from the Forest, but mainly it came from dead trees (Więcko 1984). In the Forest, a lot happened over the centuries and people's activity left its mark there. Antoni Tyzenhauz at the end of the first Republic of Poland tried to recapture the productivity of the forest in order to deliver not only entertainment but also cash to the royal treasury. In the Forest, potash was produced at that time and floating of *Supraśl* pine down Narewka (Więcko 1984) took place. Therefore, cuttings, clearings and gaps occurred in many places of the Forest. Some of those places can be identified even today; it does not always require digging holes in the ground, sometimes it's enough to take a closer look to species composition and the structure of the forest stand.

The first Republic of Poland was subjected to partition by neighbouring powers, and the Forest became shortly after this event a place of Russian tsars' hunting. In comparison to endless forests of the Russian Empire, the Forest looked like a postage stamp, but already then it was the last lowland forest in which European bison lived. That's what decided about its

attractiveness as a place for hunt in tsarist time and that's what contributed to its preservation in almost unchanged condition. During tsarist times, a decision was made to organise the Forest spatially; it was cut with regular net of wide cuttings. This division to forest compartments with a system of forest roads in compartment lines is still maintained in the developed part of the Forest. In the area of the strict protection, the lines of division into compartments cannot be seen from above; but on the forest floor, marked out straight paths are still present, which are the remains of former division lines.

In the first half of 19th century, in the Białowieża Forest, huge fires were still present; at the turn of the 19th and 20th centuries, the density of big game was so great that young generations of many tree species were almost completely eaten by wild ungulates (Więcko 1984). There is a visible gap in the age distribution of the trees in Białowieża Forest's tree stands. During World War I, the Germans did the first in the history of Białowieża Forest's extensive lumbering. At the end, European bison were also exterminated. However, thanks to Polish zoologists, it was possible to save the European bison as a species, but the return of the bison to the Białowieża Forest took place in the 1950s of the 20th century. During interwar period, the Białowieża Forest became an economy forest; only in the middle of the Forest, between Narewka and Hwoźna, a nucleus of Polish national park was formed under the name of Rezerwat Forest Inspectorate. Prof. Władysław Szafer wrote about this area that in here visible will be complete and absolute leave of nature to its own rhythm or, in other words, its wildness, and Polish biologists will study and write down the history of birth of a real primeval forest from half-cultivated forest which Białowieża Forest is today (Szafer 1922). This area covered less than 5% of the total area of Białowieża Forest (Więcko 1984); the rest was supposed to deliver wood. Worth remembering is that in terms of resources of timber, second Republic of Poland was in a situation immeasurably more difficult than modern Poland.

The Białowieża Forest wasn't in the last decades and probably much earlier a forest untouched by man. But the lack of any human's presence formed in concepts such as primary forest, virgin forest or primeval forest are only a sign of our specific way of looking at nature. It is based on the assumption that between man and nature, there is a fundamental contradiction and the very appearance of a man in some place leaves a bodeful, indelible stigma on nature.

Man is, however, a part of nature. As man appeared in different ways, he influenced on forest. 'Primeval forest' as a forest where there was no man is rather a metaphysical than scientific concept. At the same time, it's a notion practically unnecessary. None of the forests where people were able to watch was a primary forest; because in order to watch it, they had to be there, and by coming into the forest, they left their trace there. Triumphant announcement of the fact that

one or another forest is not a ‘truly primeval forest’ is indeed true but, at the same time, trivial and unnecessary. Yes, none of the forests growing presently on our planet is a primeval forest; but what results from this fact?

In approach to nature protection, besides tradition that is strongly marked with metaphysics, there is also scientific approach. It recognises that influence of a man on nature, also on forest, is gradable (Peterken 1996; Lindermayer, Franklin 2002; Samojlik et al. 2013). On one side of the scale, there is a plantation of fast-growing trees. It consists of genetically modified trees, planted evenly in rows, fertilised, hydrated and sprayed with herbicides and insecticides. A plantation is deprived practically of other species except the one which is an object of breeding and which after several years of growth will be cut down in order to make place for another, even faster growing plantation. On the other side of the scale, there is forest where, despite of many attempts, it is impossible to find any trace of human activity. That doesn’t mean of course that those traces once weren’t there. Insignificant traces, however, blur in time and are impossible to find (Hunter 1999). Researchers are not paying attention to them just like they don’t pay attention to other things that cannot be examined scientifically.

In the Białowieża Forest, there are still fragments of forest without any visible traces of human activity (Samojlik et al. 2013). Those fragments create a fine-grained mosaic with places where traces of human presence are visible: barrows from prehistoric times, traces after potash plant from 18th century, forest division lines created by tsarist staff in the 19th century and remains of beekeeping pines from before 100 years. It is known that some of the places where there are no visible traces of human activity used to carry such traces in the past. About preserving the naturalness of forest do not decide whether there are some fragments where human never has left its trace: didn’t cut the tree, didn’t burn the forest understory and didn’t graze the cattle. What is important is the continuity of the functioning of the mosaic structure that includes all phases of forest development cycle (Peterken 1996). This dynamic mosaic ensures continuity of natural processes and possibility of survival of all connected with natural forest species (Villard, Jonsson 2009). Even if every specific fragment of forest used to be transformed by human activity in its history, that doesn’t cancel the possibility of functioning of natural forest. Relevant is whether at the same time somewhere near were fragments not-provided with human activity. In the Białowieża Forest, such enclaves of undeveloped forest always were present though not always in the same places. Always the part of the forest stand not included in economic interventions created a possibility of spontaneous course of natural processes and was a backwoods of species connected with natural, old forests (Lindermayer, Franklin 2002). Those enclaves of wild nature never have been fully eliminated be-

cause of the fact that exploitation of forest didn’t last long or a large part of the Forest remained in given period beyond the reach of economy.

In other forests, also those called proudly ‘wilderness’, regular forest management with cutting age criterion that lasted for two centuries led to permanent elimination of half of stages from the development cycle of the forest (Peterken 1996). Species connected with those stages of forest development did not have any place to survive because of the fact that whole forest complexes were covered with forest management and it lasted long enough for natural, dynamic mosaic of development stages to be replaced by new type of mosaic created by forestry. In that type included are forest stands from cultures and thickets to impressive mature forest stands; there is no place, however, for advanced in age old-growth forests where the dead trees would decay or for the forest stands in decay phase called by many foresters as ‘tree cemeteries’.

In the Białowieża Forest, after almost 100 years of running regular forest management, there still are and function all elements of forest mosaic; some of them only in National Park and in reserves but some advanced in age development stages of forest stands still occur on the area of economy forests. That is why on a scale of intensity of human influence, on the lowlands of the middle of Europe, the Białowieża Forest is located in the farthest place from schematic tree plantation (Samojlik et al. 2013) and closest to the natural forest. There is nothing more natural in this part of Europe, and there will not be. The Białowieża Forest is priceless and one of a kind.

3. What the Białowieża Forest is presently?

The Białowieża Forest is presently divided as never before. For more than 70 years, it’s divided by border of the state: nearly 60% of the Forest’s area is localised presently within borders of Belarus. This part is ‘Bielowieżskaja Puszcza’ National Park. Polish part of the Forest, of area around 62,000 ha, has a diversified status. Białowieża National Park covers 10,000 ha. Remaining 52,000 ha is divided between three forest inspectorates of the State Forests: Białowieża, Browsk and Hajnówka. However, from 52,000 ha of area managed by the State Forests, around 13,000 ha represent nature reserves of which significant part are strict reserves. Forest may be managed on the area around 39,000 ha; however, significant part of this acreage is forest stands over 100 years old and wetlands where since few years no cuttings have been made. Nature reserves, forest stands excluded from forest management and managed forest stands create in total a very complicated mosaic.

Situation in the Białowieża Forest looks differently from local perspective and differently from wider, national or international perspective. It’s the contrast between local and

global perspective what's the base of current conflict. From local economy point of view, the Forest is important as a place for harvesting and then processing of wood. This applies to Białowieża to a small extent because its inhabitants are making a living from providing tourist services. But for many locations on the outskirts of the Forest, the work in the forest or in sawmill is an important source of income. It looks differently from national perspective: managed forests of the Białowieża Forest constitute less than half percent of whole area of forests belonging to the State Forests National Forest Holding. From the State Forest perspective, the Białowieża Forest has no important meaning for wood production, regardless of how impressive sound, quoted at various occasions, number of dead trees rotting in the Forest. But for three forest inspectorates localised in the Forest, those numbers can be very essential. It's hard to assess the authenticity of arguments used in discussion because of the lack of reference to scale – local or national. From the State Forest authorities perspective, Białowieża Forest it's not about the wood nor the money that results from it. But from local perspective, things may look differently.

Concept of protection zoning of Polish part of the Białowieża Forest was included in document submitting it as a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Natural Heritage Site. This conception was a base for including whole area of the Forest on a list of World Natural Heritage Site. It's an important obligation and a serious argument in a discussion. The Białowieża Forest is a unified entity in social awareness; in reality, it's a forest divided between countries and institutions. Status of individual parts is very diversified, and the course of the borders is complicated. It favours conflict escalation because proposed solutions for a part of the Forest are perceived and commented like it would refer to the entire Forest. This results in the appearance of information that somebody wants to 'cut down the Białowieża Forest' and somebody else wants to forbid any human activity in it. What it is really about, is the change in proportion between strict protection and different forms of management.

If one wants to discuss the subject of the Forest with a foreigner who knows the case from the media, then usually, after hearing that the case concerns only part of the Forest that is a managed forest with an outbreak of spruce bark beetle, he loses the whole interest in the matter. He thought earlier that foresters in Poland want to cut down the forest in famous national park. On the other hand, when heard of the declarations of some foresters who intent to 'save' the existence of the Białowieża Forest by fighting bark beetle, one can just smile with compassion. After all, on 70% of the Forest's area, there will be no 'fight with a bark beetle'. There will be no such fight in Belarusian part of the Forest, in Białowieża National Park or in strict reserves scattered densely amongst econo-

my forests. Discussion on the Forest present in the media was dominated by two extreme and false narrations; not only foreigners are lost in it but also many of the locals. Most of all, lost is the essential content of the dispute.

What the Białowieża Forest is suppose to be in the future ?

The fundamental question regards the vision of the Forests' future: should the Polish part be still, like it was since 1920, managed forest with protection enclave in the form of national park and nature reserves or should it be a national park as a whole? This second possibility is the only real solution that would bring the Białowieża Forest somehow homogeneous status. The entire Belarusian part of the Forest is already a national park; after including whole Polish part of the Forest to a national park, the last line of division would be the border of the state. It would be – though imperfect – reintegration of the Białowieża Forest.

The plan of including whole Polish part of the Forest into a national park was elaborated in 2006 by the team appointed by the President Lech Kaczyński. This plan included diversification of protection regime for different parts of the Forest; strict protection would cover the national park within its present borders and substantial part of Leśna valley. In total, the area of strict protection would be, in terms of size, comparable with current state, if included are existing currently strict reserves within borders of the forest inspectorates. A large area would be covered with the so-called 'use value preservation' that allows for cutting directed at forming of species composition and the structure of forest stands. It would be a continuation, in great measure, of what had been done in three forest inspectorates of the Białowieża Forest until the prohibition of cutting in over 100 years old forest stands prevented enlarging the existing canopy gaps and releasing of regeneration that appeared on them. Regeneration which in conditions of strict protection at large pressure of herbivores appears in very small numbers.

None of the existing currently serious plans concerning the future of the Białowieża Forest includes covering its whole area with strict protection. None of the plans includes liquidation of the national park and nature reserves present currently in the Forest. The dispute refers mainly to general form of protection of the Forest and proportions between strict protection, which is ceasing any interference in natural processes, and active protection, which is aimed at preserving certain species of communities. Those problems, however important and requiring substantive decision, are not problems of essential matter. Regardless of what decisions will be taken in the nearest future, changes will only apply to a part of the Białowieża Forest. Arguable is whether

those changes will be inevitable and irreversible. During past century, the Białowieża Forest was subjected to many more radical changes; however, always, the forest had the possibility of regenerating. This mechanism isn't threatened, fundamentally, by planned increase of cutting.

Worth noting is, however, that in the past decades, the changes in the Forest were directed at the reduction of forest stands' utilization and increase of protected area. Faster or slower with bigger or smaller resistance but this process kept proceeding. The Białowieża Forest has become famous in the world. As a place where bison were saved from the extinction and, at the same time, preserved was different, more wild forest. We have already managed to forget about the times when the nature of the Forest was threatened by wasteful exploitation of forest stands, and the bison has disappeared from the Forest for a while. Expectances towards nature protection are presently bigger than they used to be once. The meaning of the Białowieża Forest as a source of raw material from national perspective is marginal; the demand for wood may be fully covered without a need for removal of any tree from Forest's area. It's an important element of context to the current dispute. Supplement to forest management plan in the Białowieża Forest Inspectorate is a first from a few decades attempt of reversing long-lasting trend of increasing the area subjected to different forms of nature protection. Currently proposed changes are perceived as a step back. After many decades in the Białowieża Forest, which was and is a flagship of nature protection in Poland, a regress may occur. It will be a decision extremely difficult to justify and defend.

Conflict of interest

The author declares lack of potential conflicts.

Acknowledgements and source of funding

The study was elaborated from author's own resource

References

- Hunter M.L. (red.) 1999. Maintaining Biodiversity in Forest Ecosystems. Cambridge University Press, Cambridge.
- Lindenmayer D.B., Franklin J.F. 2002. Conserving Forest Biodiversity. A Comprehensive Multiscaled Approach. Island Press, Washington-Covelo-London.
- Paczoski J. 1930. Lasy Białowieży. Wyd. Państwowej Rady Ochrony Przyrody, Poznań.
- Peterken G.F. 1996. Natural Woodland. Cambridge University Press, Cambridge.
- Samojlik T. (ed.) 2005. Conservation and Hunting. Białowieża Forest in the Time of Kings. Instytut Biologii Ssaków, Białowieża.
- Samojlik T., Jędrzejewska B. 2004. Użytkowanie Puszczy Białowieżkiej w czasach Jagiellonów i jego ślady we współczesnym środowisku leśnym. *Sylwan* 148(11): 37–50.
- Samojlik T., Rotherham I.D., Jędrzejewska B. 2013. Quantifying Historic Human Impacts on Forest Environments: A Case Study in Białowieża Forest, Poland. *Environmental History*. DOI 10.1093/envhis/emt039.
- Smólski S. 1981. Zarys przeszłości Puszczy Niepołomickiej, w: Wartości Środowiska przyrodniczego Puszczy Niepołomickiej i zagadnienia jej ochrony, *Studia ODF*. (ed. A.S. Kleczkowski). T. IX. PAN, Kraków, 9–24.
- Szafer W. 1922. Uwagi o celach i organizacji badań naukowych w polskich parkach natury. *Ochrona Przyrody* 3: 10–15.
- Villard M.-A., Jonsson B.G. (ed.) 2009. Setting Conservation Targets for Managed Forest Landscapes. Cambridge University Press, Cambridge.
- Więcko E. 1984. Puszcza Białowieża. PWN, Warszawa.
- Zaręba R. 1981. Puszcze, bory i lasy Polski. PWRiL, Warszawa.