



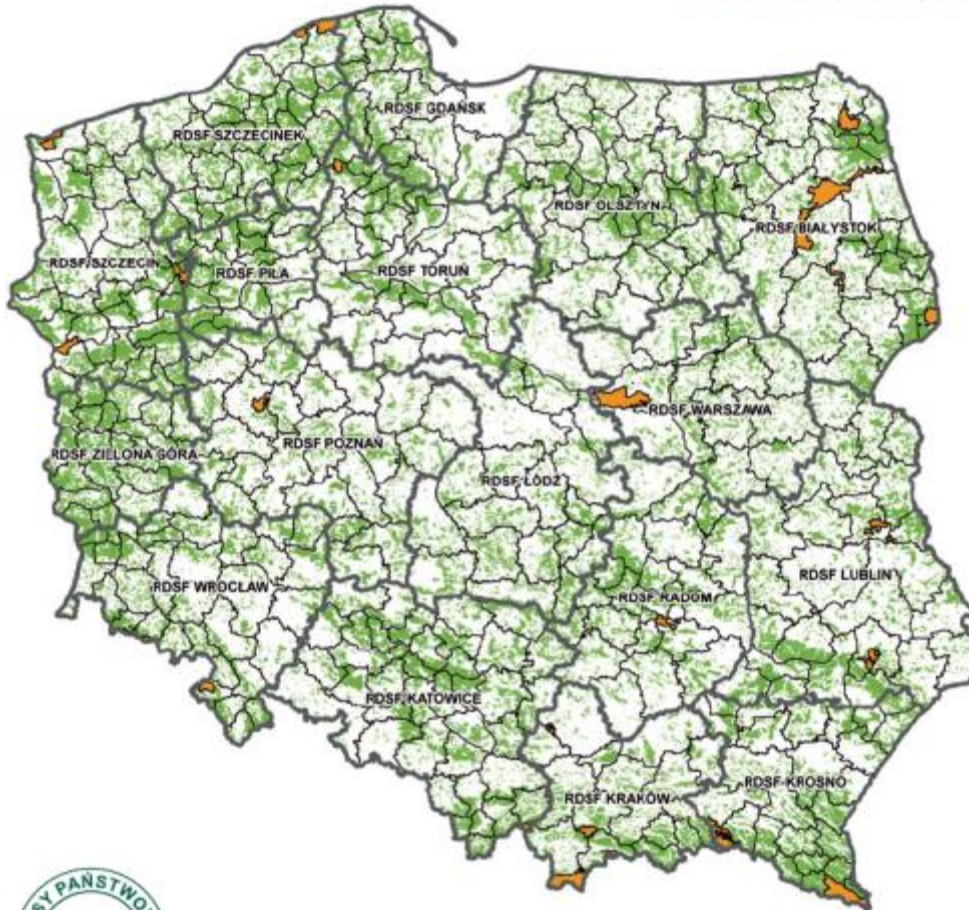
Państwowe Gospodarstwo Leśne
Lasy Państwowe

Nature and Forestry in Białowieża Forest against a background of forests in region and Poland

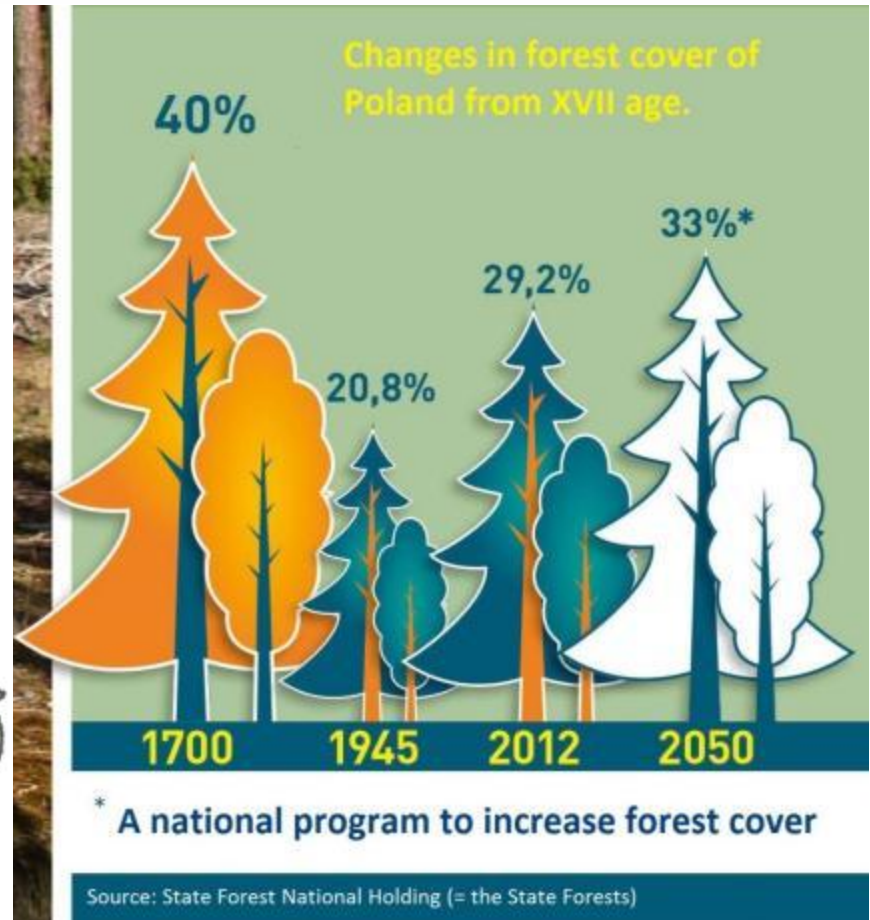
Andrzej Antczak
Nadleśnictwo Hajnówka

Białowieża, 20-21-22.04.2015

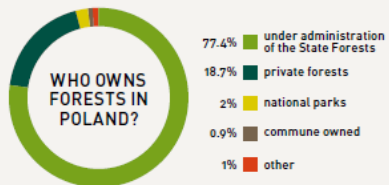
Territories of forest districts and regional directorates of the State Forests



- RDSF boundaries
- forest district boundaries
- national parks
- forests

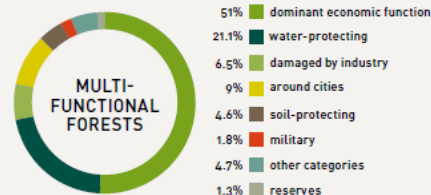


POLISH FORESTS IN FIGURES



FOREST COVER IN POLAND
29%

0.24 HECTARES OF FOREST PER PERSON

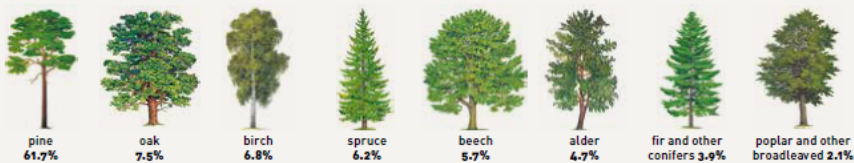


65% of species of flora fauna and fungi are associated with the forest environment

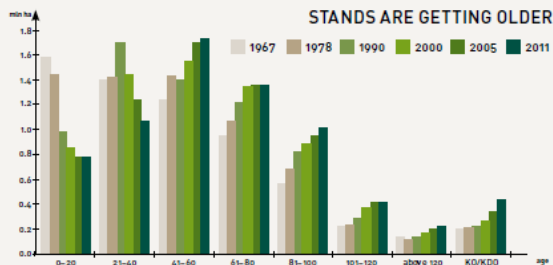
40% of forests administered by the State Forests are included in the European network Natura 2000

THE STATE FORESTS

DOMINANT TREE SPECIES IN THE STATE FORESTS



AREA
7.6
MILLION HECTARES



NATURE CONSERVATION



Nature reserves
1255



Natural monuments
11 498



Areas of ecological utility
9262

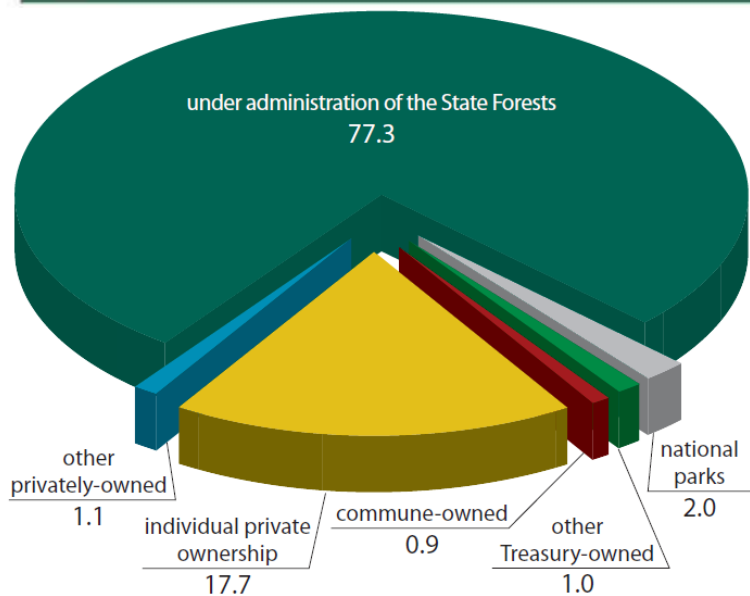


Protection zones for selected species
3091

TIMBER HARVEST IN 2012
35
million m³



EMPLOYMENT 25 THOUSAND PERSONNEL



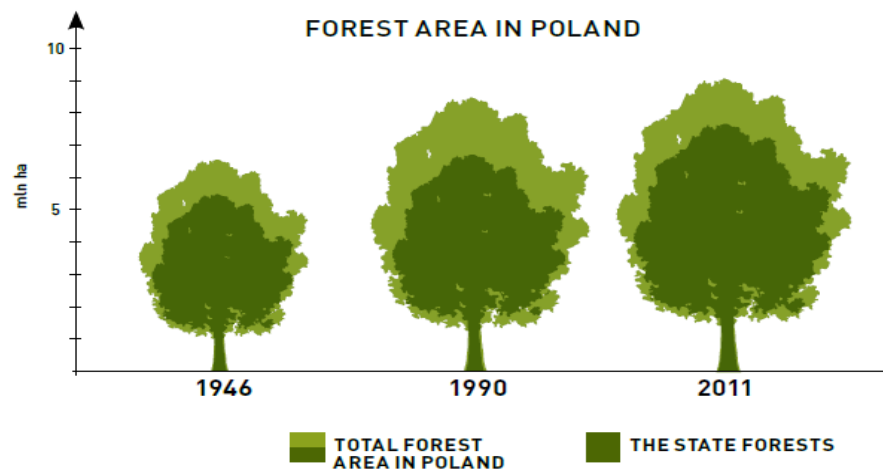
Ownership structure of forests in Poland (Central Statistical Office)

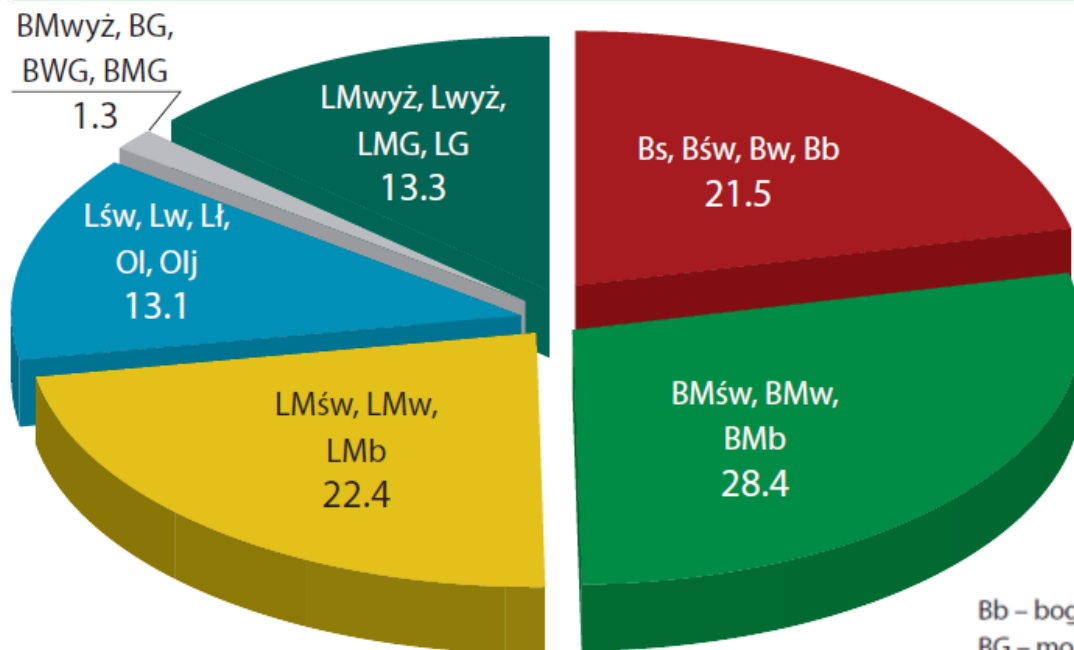


Land use structure

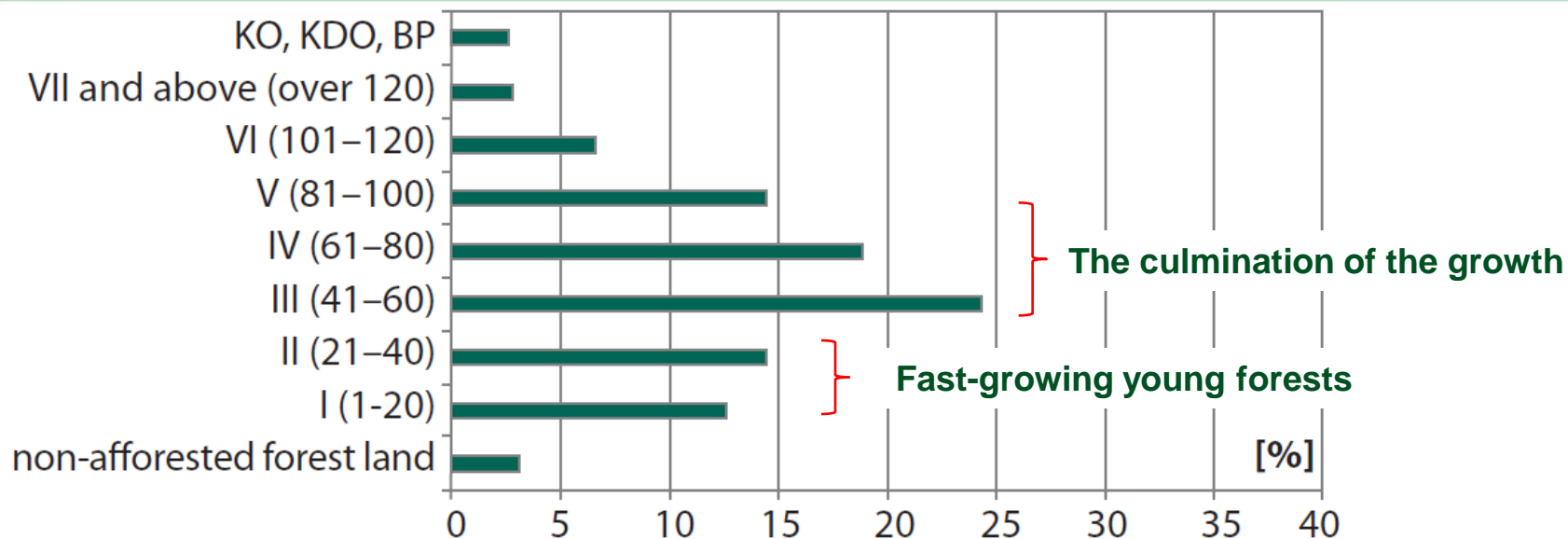
As of 31 December 2012, the total area of land administered by the State Forests amounted to 7 597 024.04 hectares and it was structured as follows:

– forests, total	7 279 653.67 ha
including: afforested land	6 975 204.02 ha
non-afforested land	104 158.13 ha
– agricultural land	145 682.94 ha
– wasteland	101 167.38 ha
– waters	9 017.59 ha
– landscape tree and shrub planting	12 146.98 ha





- | | |
|--|---|
| Bb – bog coniferous forest | Lł – riparian forest |
| BG – montane coniferous forest | LMb – bog mixed broadleaved forest |
| BMb – bog mixed coniferous forest | LMG – montane mixed broadleaved forest |
| BMG – montane mixed coniferous forest | LMśw – fresh mixed broadleaved forest |
| BMśw – fresh mixed coniferous forest | LMw – moist mixed broadleaved forest |
| BMw – moist mixed coniferous forest | LMwyż – upland mixed broadleaved forest |
| BMwyż – upland mixed coniferous forest | Lśw – fresh broadleaved forest |
| Bs – dry coniferous forest | Lw – moist broadleaved forest |
| Bśw – fresh coniferous forest | Lwyż – upland broadleaved forest |
| Bw – moist coniferous forest | Ol – alder forest |
| BWG – high-mountain coniferous forest | Olj – alder-ash forest |
| LG – montane broadleaved forest | |



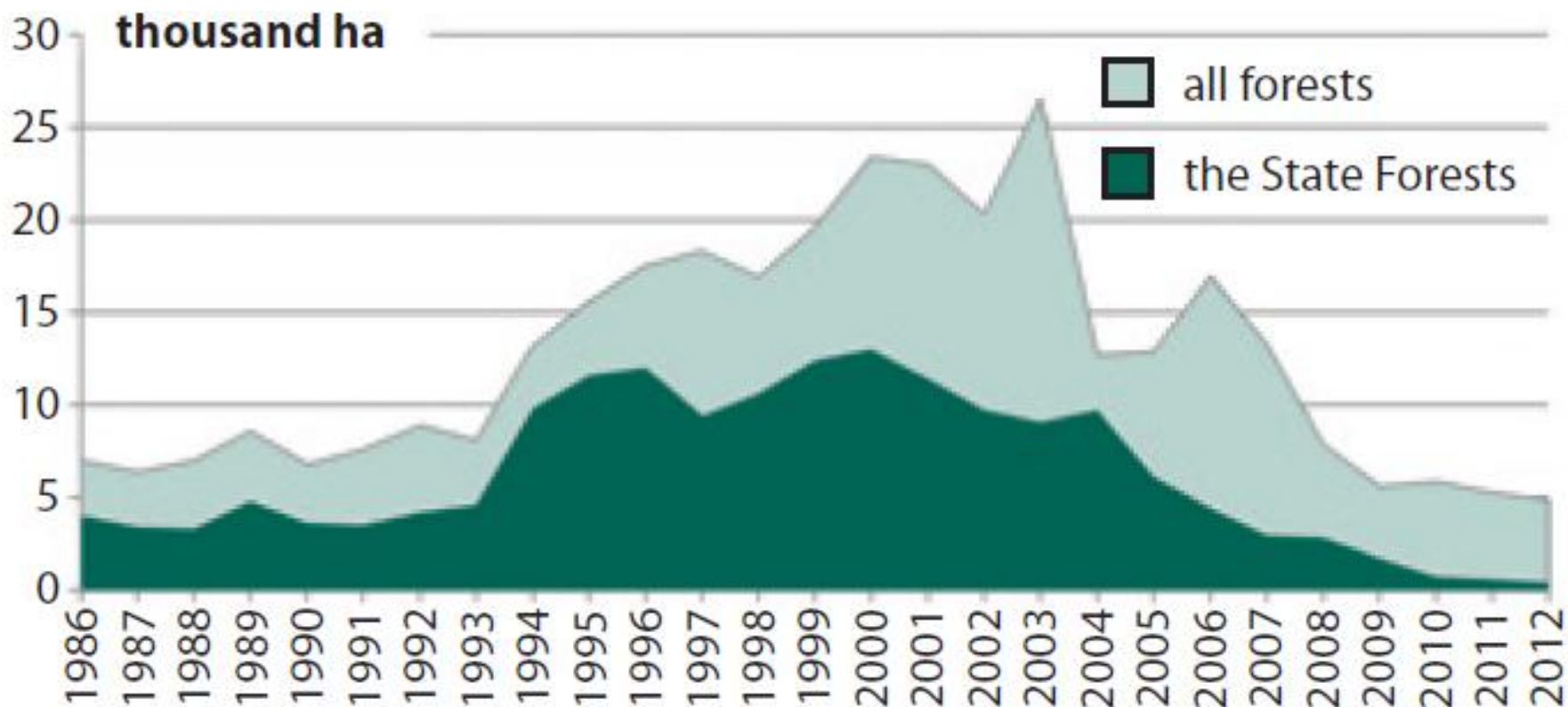
Areal share of stands by age class in the State Forests (Large-Scale Forest Inventory)

Stands aged 41-80 years (class III and IV) prevail in the age structure of forests and cover 45,1% of the forest area (ca. 3 145 817 ha)

KO = stands older than 100 years, including stands in the restocking class

KDO = stands in the class for restocking

BP = stands with selection structure



The level of artificial afforestation in Poland in the years 1986–2012 (Central Statistical Office)

...The (Kyoto) Protocol listed and evaluated various forestry-related actions aimed at increasing carbon sequestration and included them in the total balance of greenhouse gas emission and absorption. The general principles of working out this balance are based on the Kyoto Protocol and decisions taken at the subsequent Conferences of the Parties. At the last Conference in Doha (Qatar) in 2012 it was decided to extend the commitment period for the second term, until 2020.

According to the estimates based on the available data on timber resources in Poland, the forest biomass contains 1099 million tones of carbon, of which 26 million tones occur in dead wood* (SoEF 2011). The amount of CO₂ absorbed every year by forests (including soil and taking into account utilization) is estimated at 34 million tones, which roughly equals 9.3 million tones of carbon.

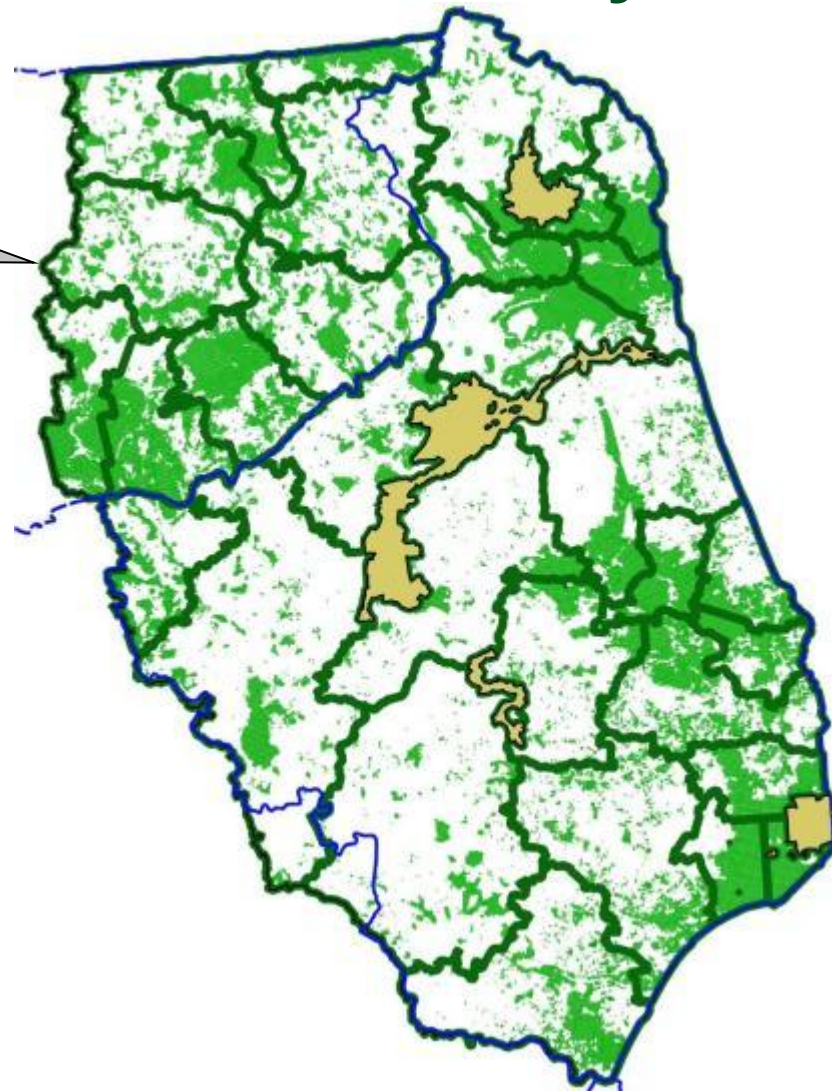
*Timber used by man in wooden buildings (etc.) stop carbon for next many years

Regional Directorate of State Forests in Białystok



Area:

Administrated by SF	— 625,000 ha
including forests	— 587,000 ha
Public forests	— 42,000 ha
Private forests	— 214,000 ha



Land of great forests in Białystok Region



Romincka 13 thous. ha

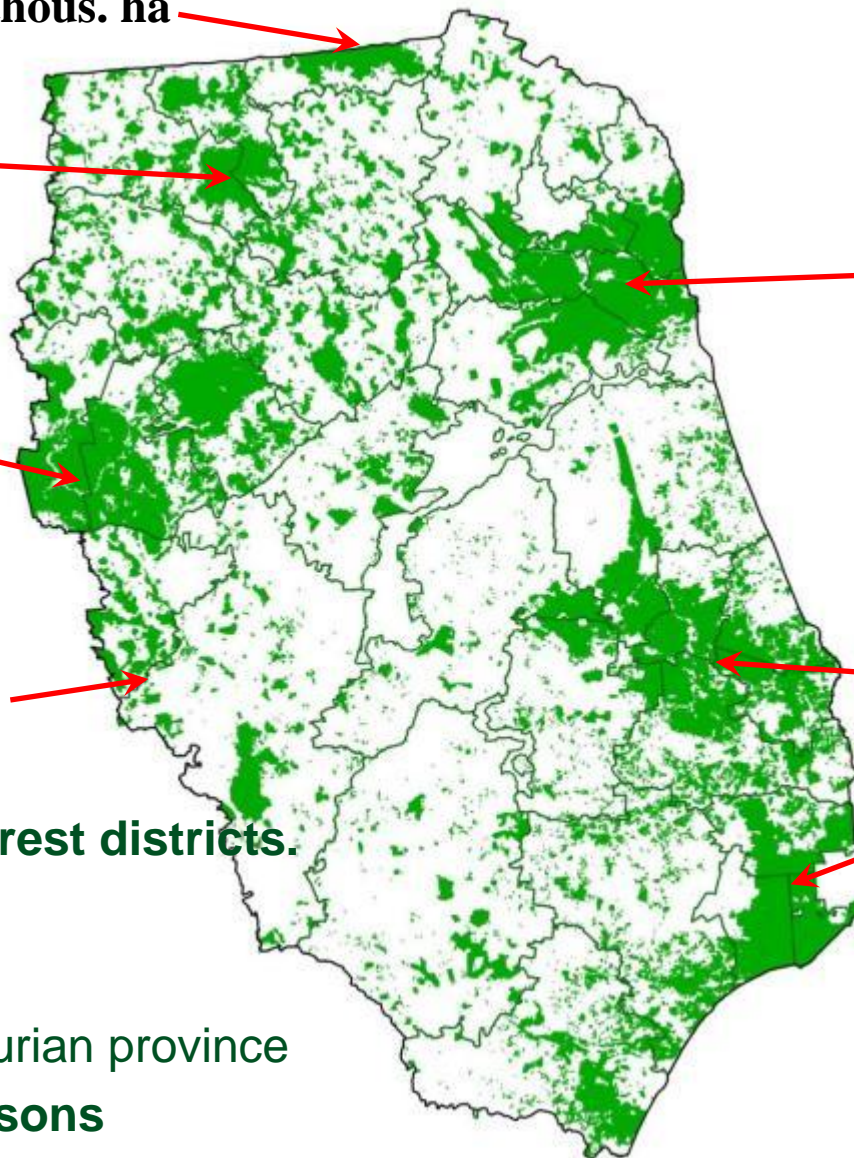
**Borecka
30 thous. ha**



**Piska
70 thous. ha**



**Kurpiowska
34 thous. ha**



**Augustowska
110 thous. ha**



**Knyszyńska
105 thous. ha**

**Białowieska
62 thous. ha**



**Forest administration: 31 forest districts.
in this:**

- 22 on Podlasie province
- 9 on Warmian and Mazurian province

Employers: ca. 2 thous. persons

Social:

- Assurance health-enhancing and recreational conditions for society and contributing to the labour market;
- Social education about forests and forestry.



Environmental:

- Nature protection;
- Regulation of water cycle;
- Prevention of floods;
- Soil protection;
- Landcape protection;
- Favourable impact on shaping of the local and global climate.



Produkcyjnej:

Primarily production of renewable biomass, including timber and non-timber products.



Nursery:

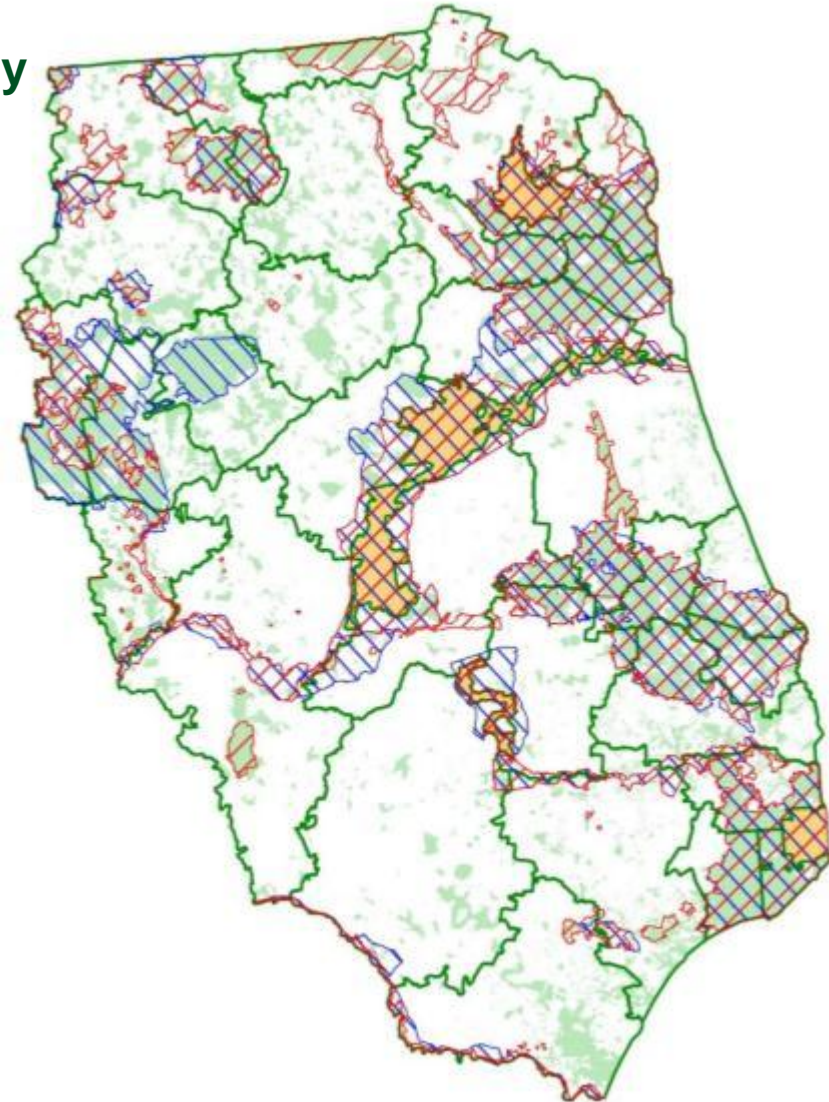
- 29 in forest districts – 151 ha, including:
 - ✓ 1 at Hajnówka Forest District (collaboration with Forestry Faculty in Hajnówka/University of Technology in Białystok,
 - ✓ 1 container at Suwałki Forest District;
- Seedlings production: ca. 25 million per year.

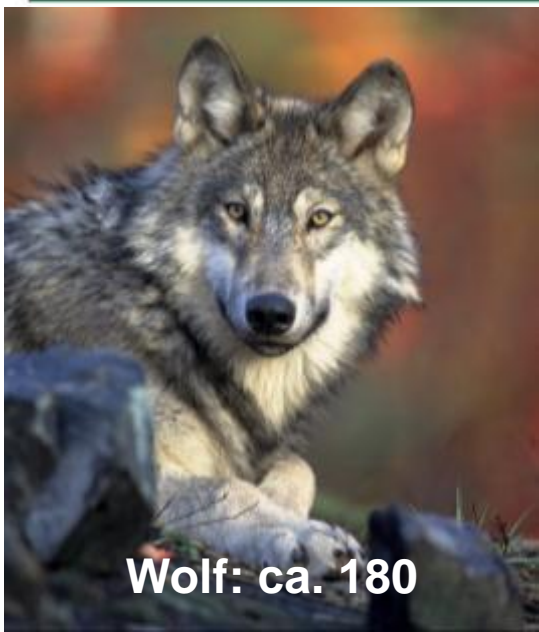
Forest restocking – ca. 3500 ha per year.

Afforestation – ca.50 ha per year.



- National parks – 4;
- Natura 2000: 63% of lands administrated by RD Of SF in Białystok;
- Nature reserves – 120 (above 30 tys. ha);
- Landscape parks – 6 ;
- Other:
 - Protected zones around nests of rare birds strefy - 358,
 - Nature monuments (trees, big stones) - 1557,
 - Area with protected landscape - 36.





Wolf: ca. 180



**White-tailed eagle:
ca. 76 zones**



Lynx: ca. 70



European bison: above 700



Elk/moose: ca 8 thous.

Animals:

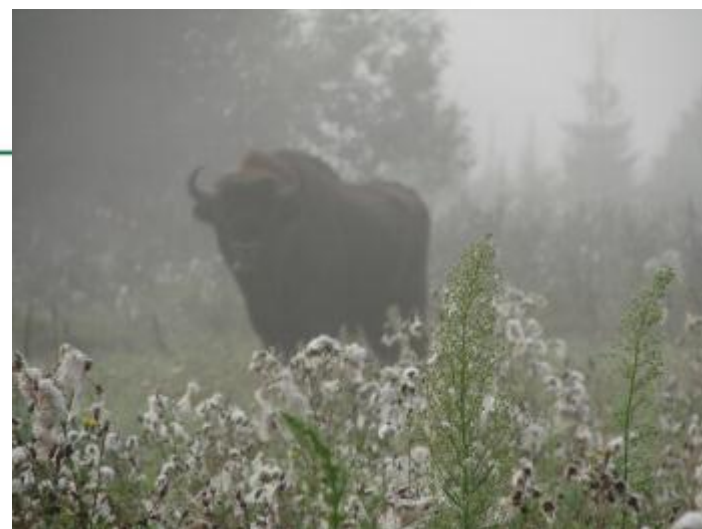
59 species of mammals,

> 250 species of birds,

13 species of amphibians,

7 species of reptiles,

> 12 000 species of invertebrates.



October 1997 - January 1998

Home range of lynx:

- Male 248 km²
- Female 133 km²

Białowieża National Park:

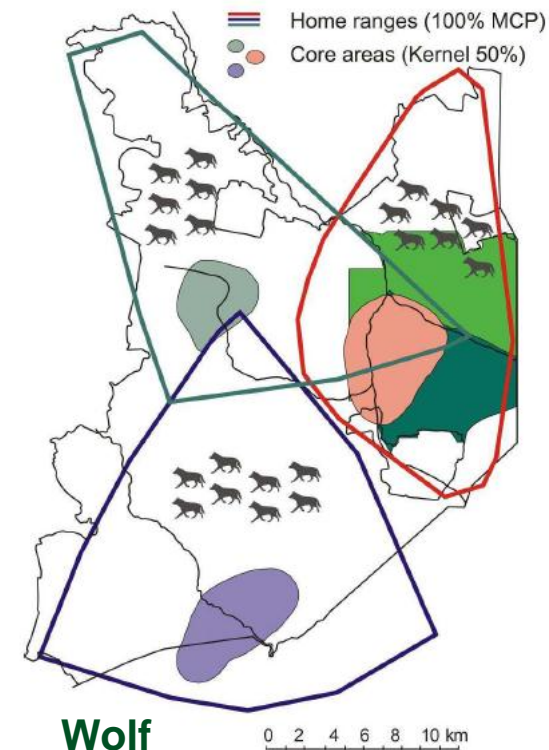
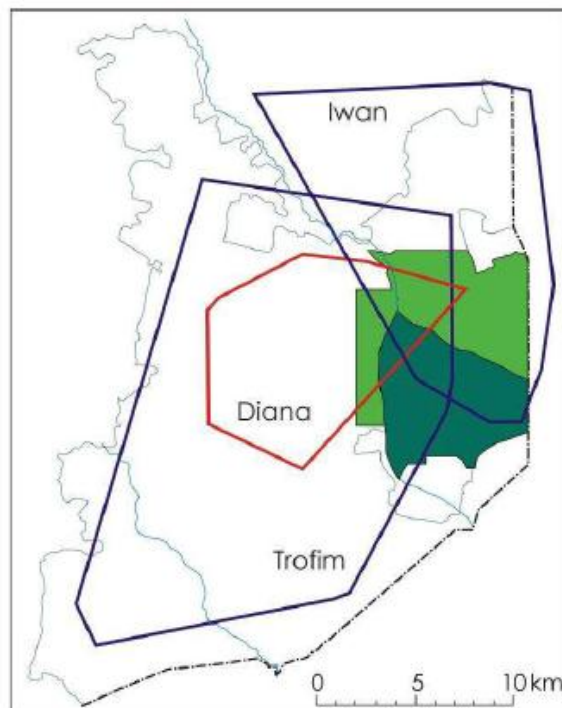
- Strict protection
- Partial protection

— borders of the Białowieża Forest

- - - state border

Lynx

Source: Schmidt et al. 1997



Wolf

**Gatunkiem o szczególnym znaczeniu w Puszczy
Białowieskiej jest żubr**

**w stadzie wolnym – 505 osobników
w hodowli zamkniętej – 40 osobników**

Żubry on-line: www.lasy.gov.pl/zubr

Ponad 1 mln odwiedzających



**Jest to największa populacja wolno
żyjących żubrów na świecie.**

**Średniorocznie obserwuje się przyrost
populacji o ok. 4%.**



Total area: 1250 km²,
Polish part: 632 km².

In this:

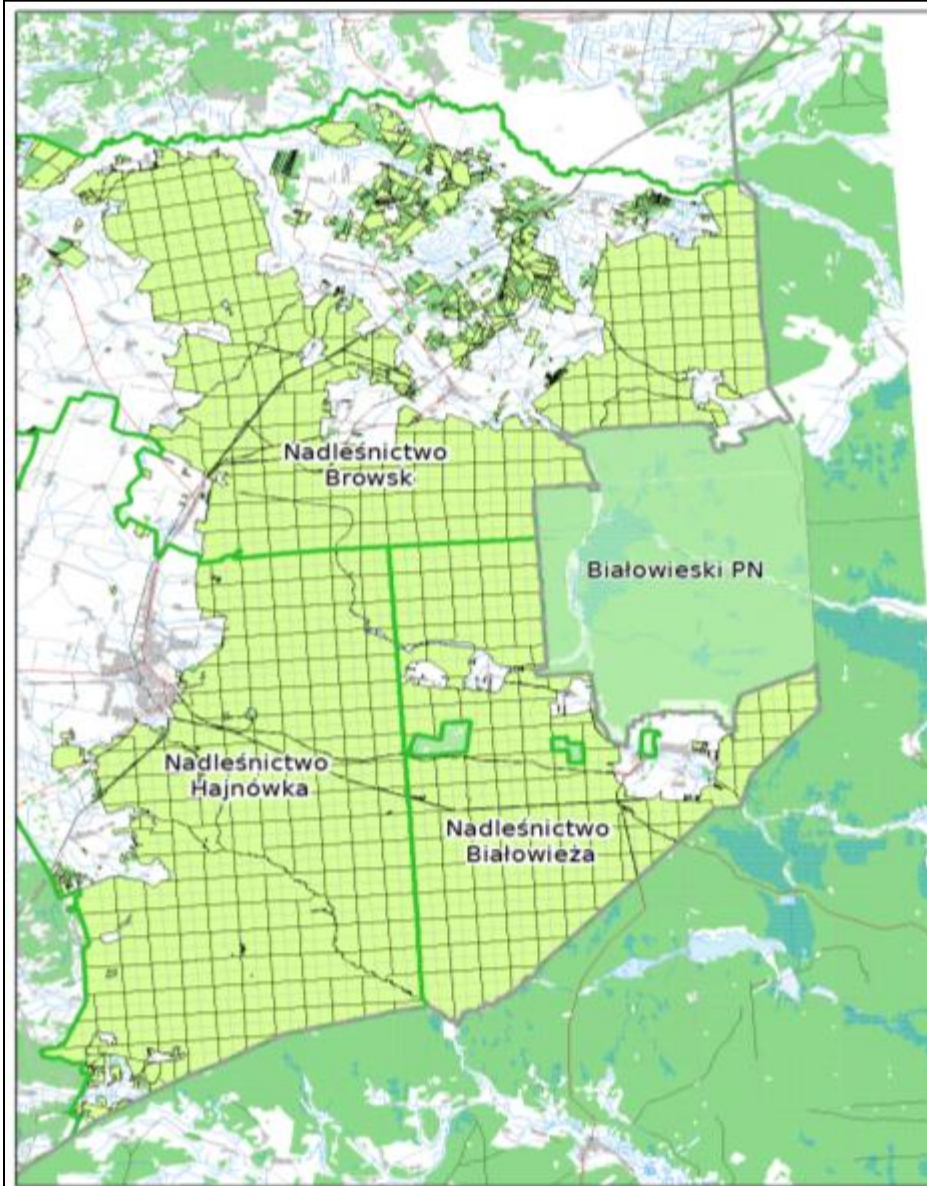
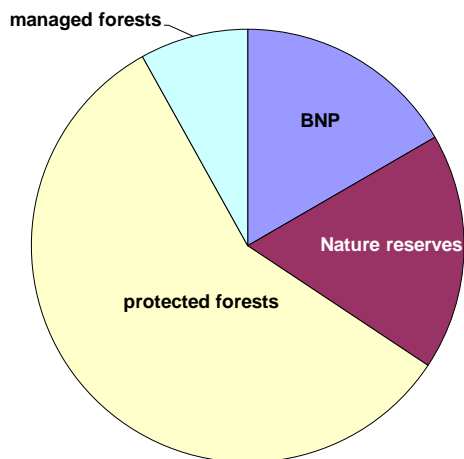
Białowieża National Park - 10 502 ha

Białowieża Forest Distr. - 12 593 ha

Browsk Forest Distr. - 20 415 ha

Hajnówka Forest Distr. - 19 666 ha

Totally managed by SFNFH - 52 674 ha

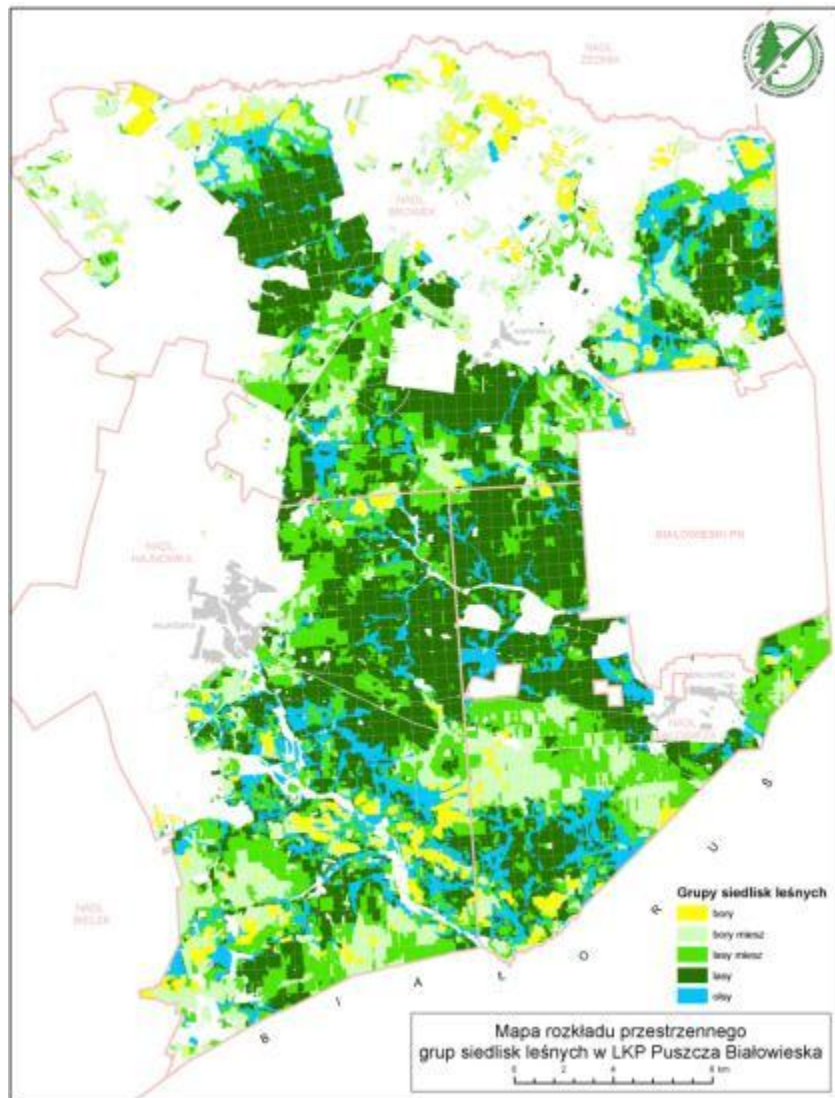


Parameters	In forests managed by forest districts in BF*	In forests managed by SFNH**
The average age of stands	85 years	62 years
The average wealth stands	335 m³/ha	261 m³/ha
The average amount of dead wood	24,8 m³/ha***	5,3 m³/ha

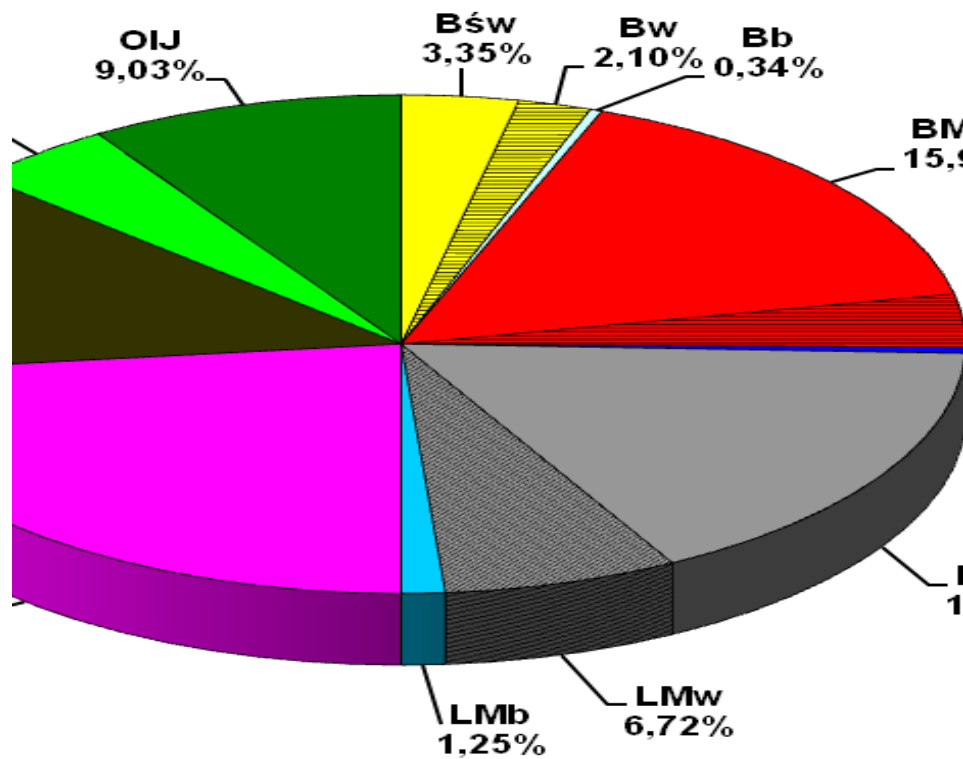
* - forest management plan: 2012 – 2021;

** - Office for Forest management and Geodesy 2014 – data on 01 January 2013;

*** - after 2014 (next year of gradation spruce bark beetle) increased about 3,5 m³/ha (sum of dead wood: 28,3 m³/ha).

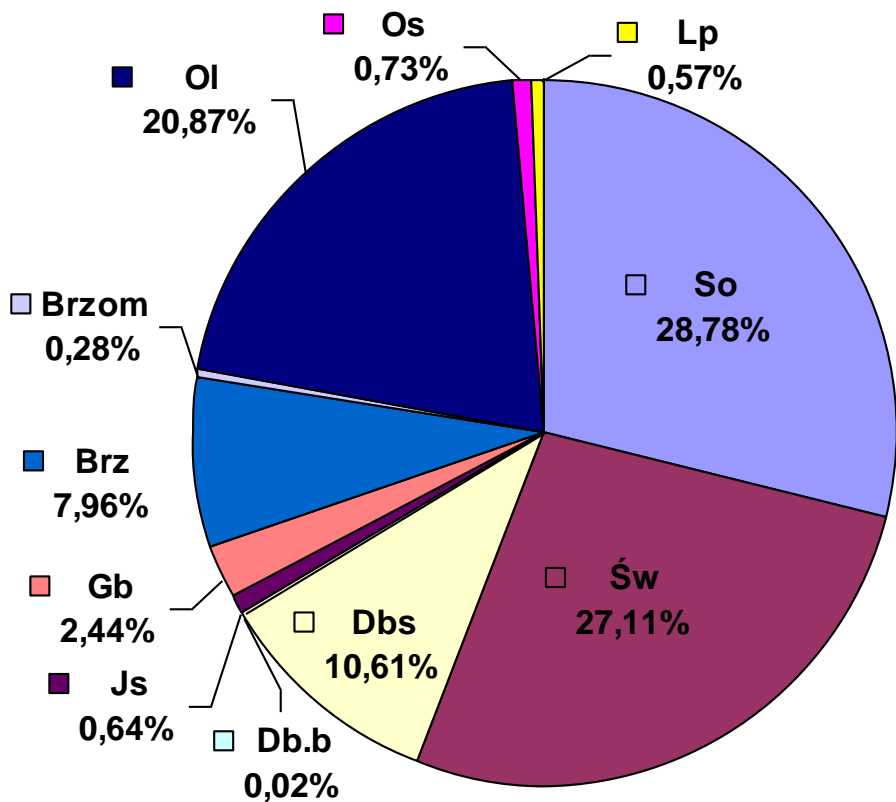


Forest types

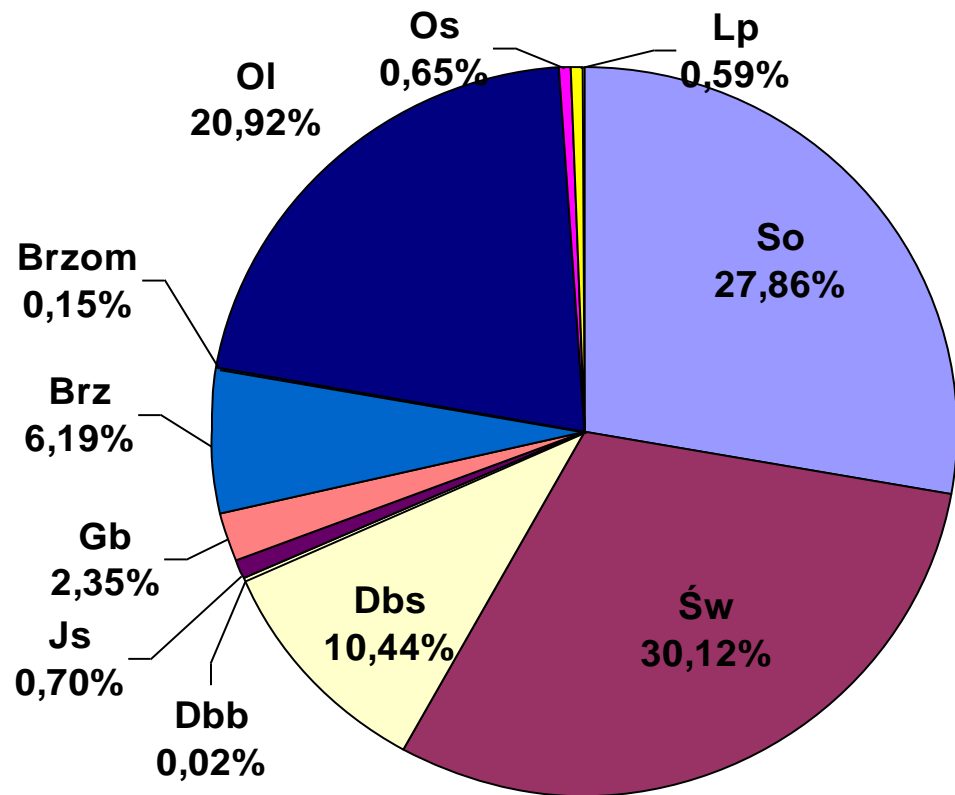


Broadleaved stands – 61,1% Swamp forests (b) – 1,97%
 Coniferous stands – 25,6% Wet forests (w) – 25,81%
 Alder stands – 13,3%

Dominant species



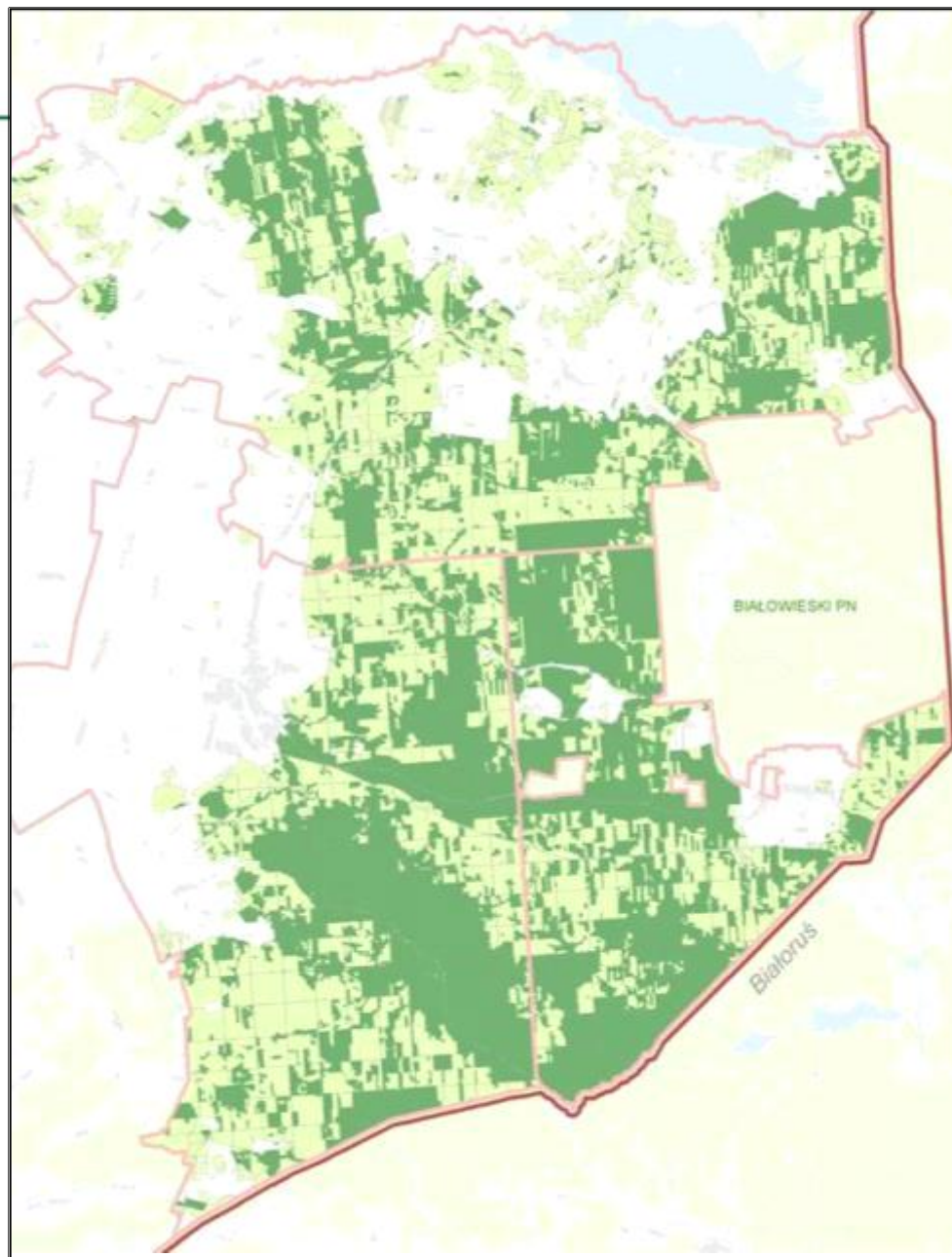
areal



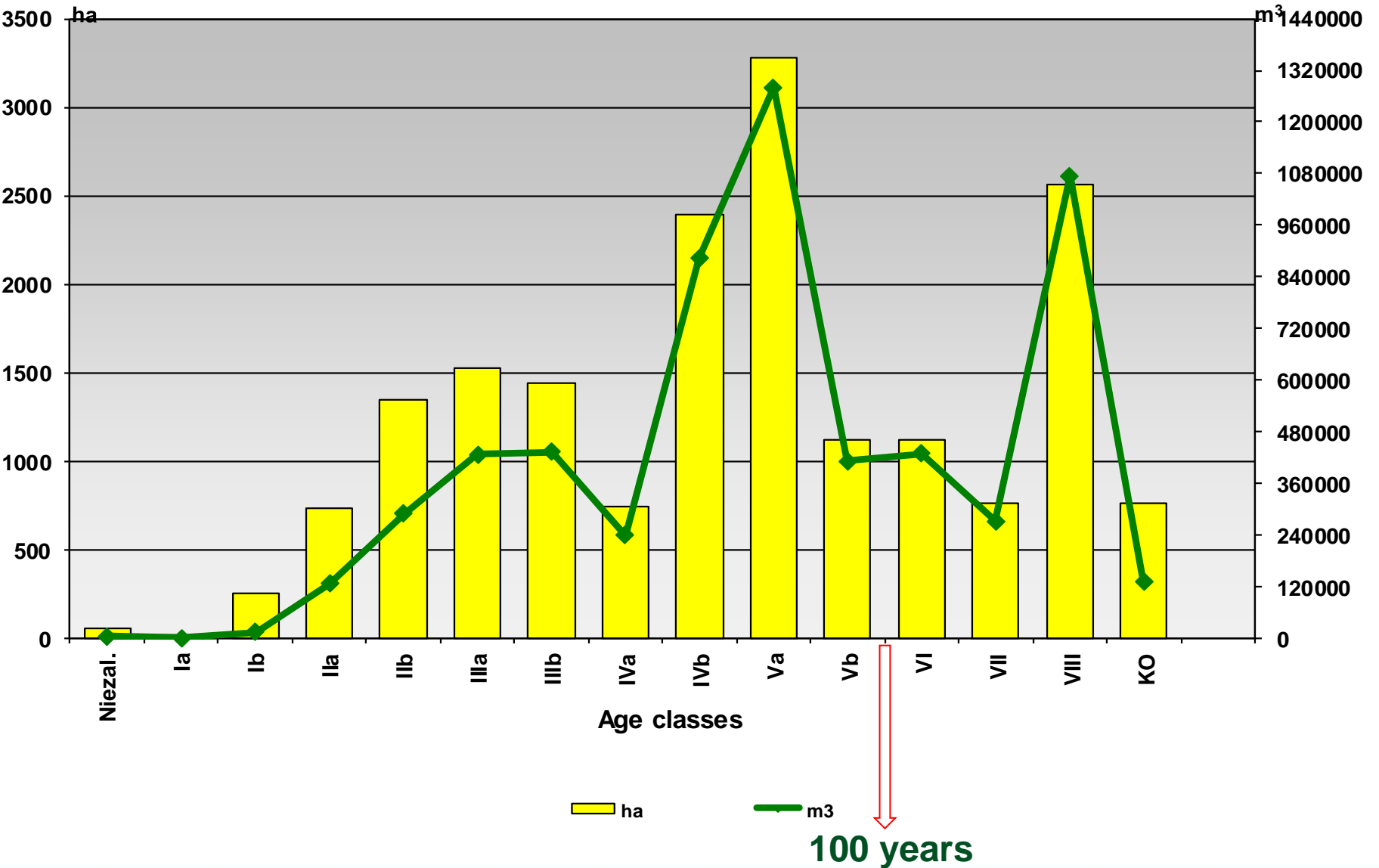
volume

So – Pine; Św – Spruce; Db – Oak; Lp – Lime; Js – Ash; Brz – Birch; Gb – Hornbeam; Os – Aspen; Ol – Alder

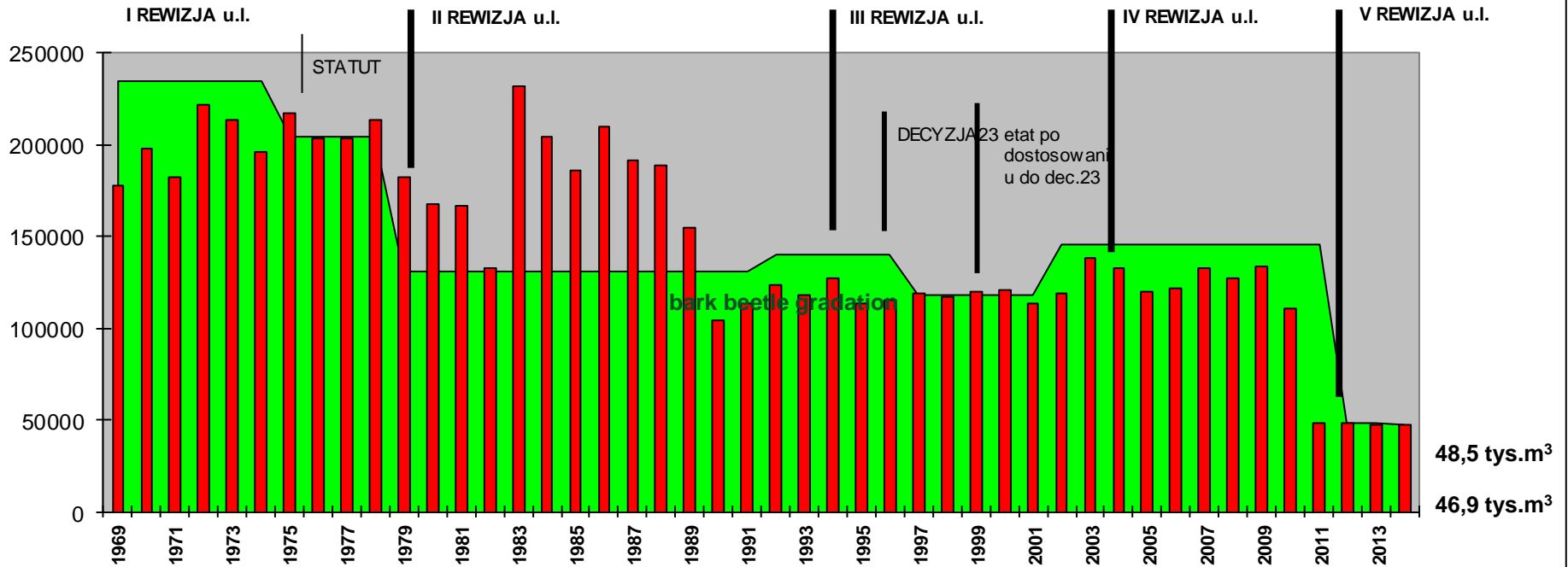
Over 100 years old stands in
Białowieża Forest takes
13,790 ha, including 8,790 ha
outside nature reserves



Inventory - Age class system (outside NR)



Timber using in Bialowieza Forest forest districts from 1969 to 2014



Drought, wind storm and howling blizzard and bark beetle gradation

Bark beetle gradation

New definition of >100 years old stands

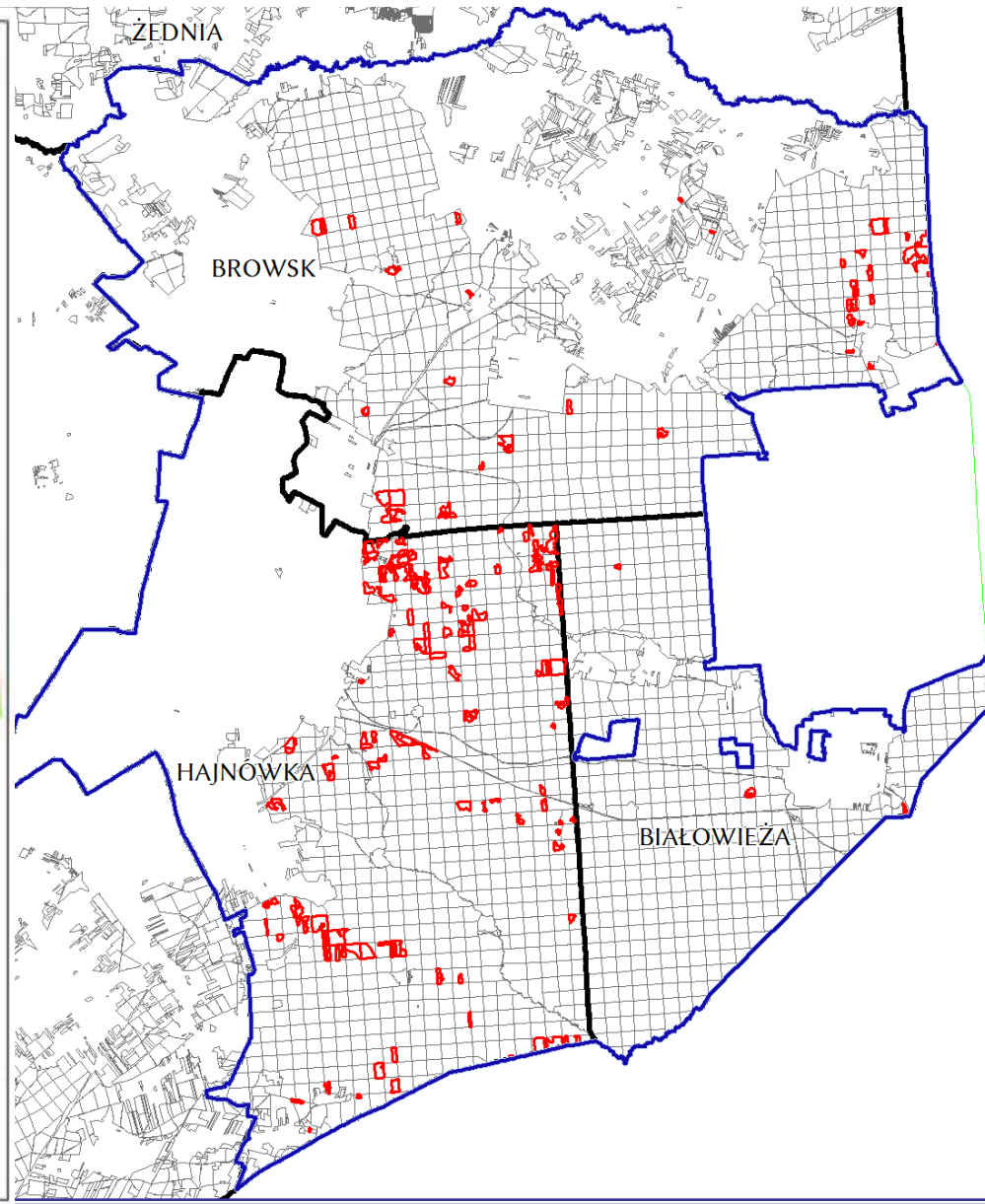
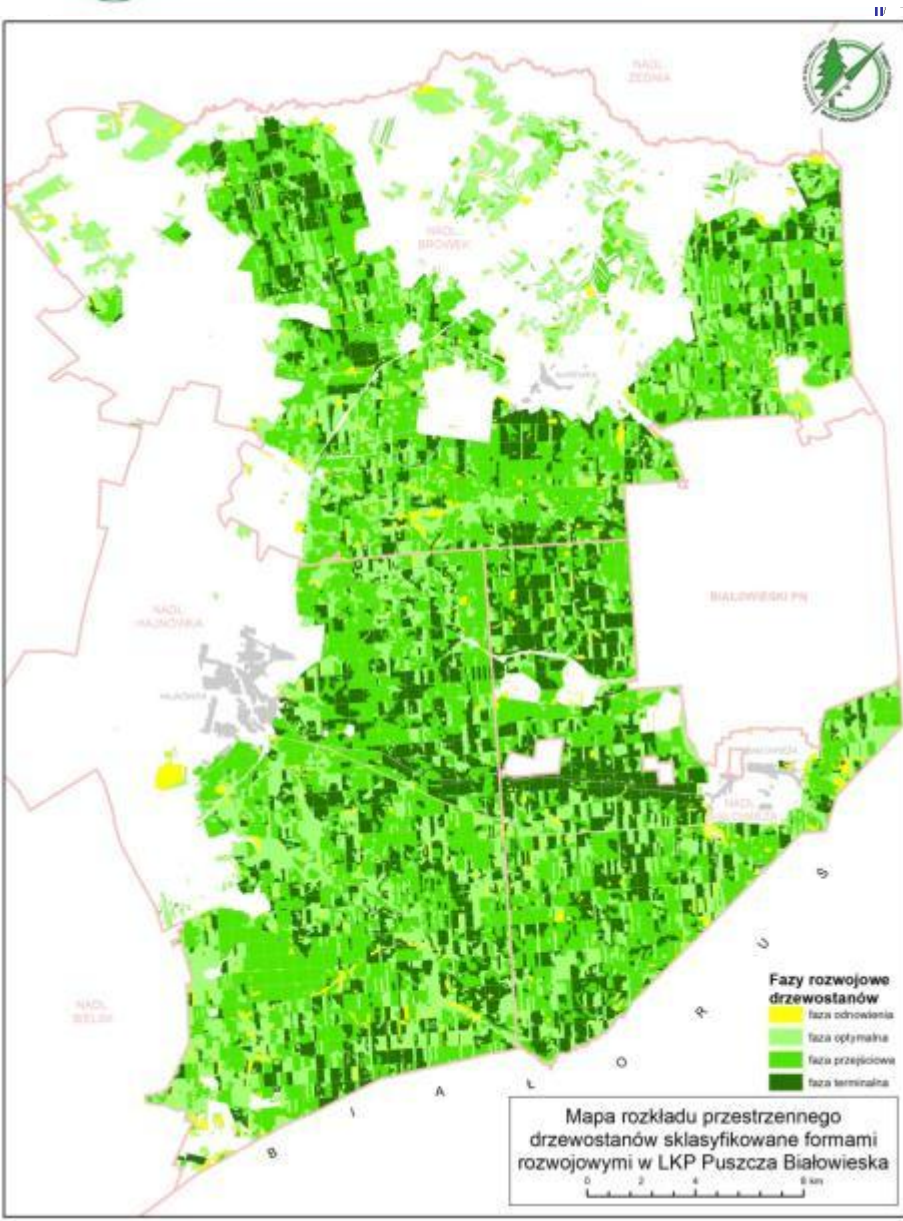
New management plan

Main timber using 2012 -2021 (cuttings for restocking and thinings)

Forest district	Potentially	Approved
Białowieża	166 594	63 471
Browsk	435 319	214 218
Hajnówka	472 231	192 291
Together	1 074 144	469 980

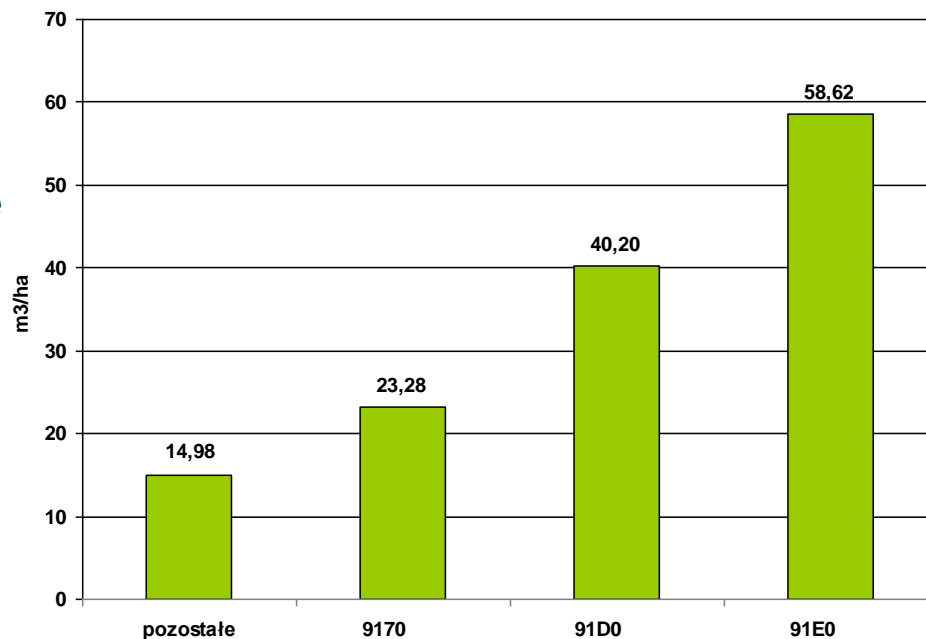
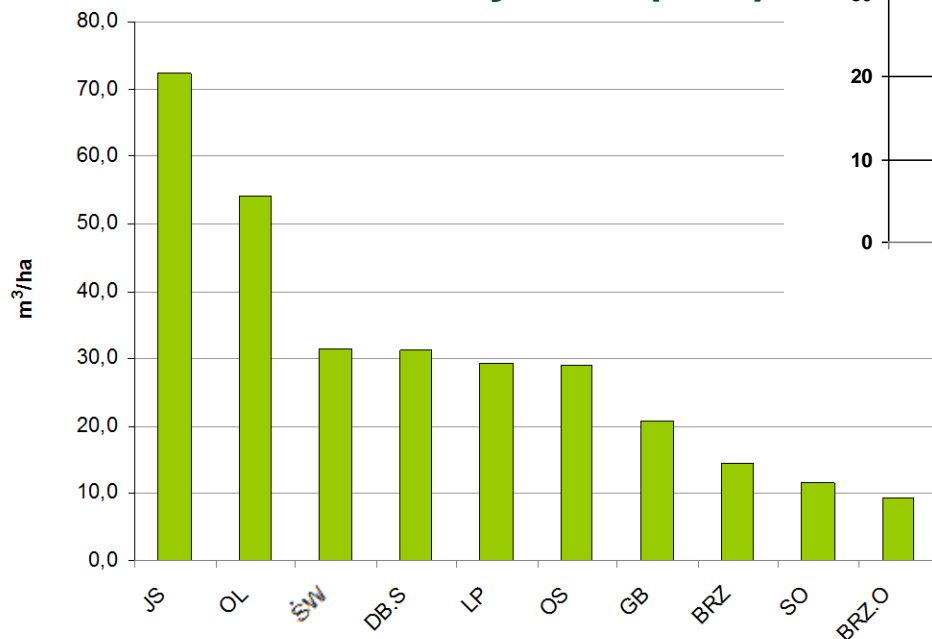
Average per year - 46 980 m³ (netto)

Approved forest management plan to minimize forest management.



In our climate zone wood breaks up 10-50 years (C. Okołów, J.B. Faliński) or 10-100 years (J. Gutowski)

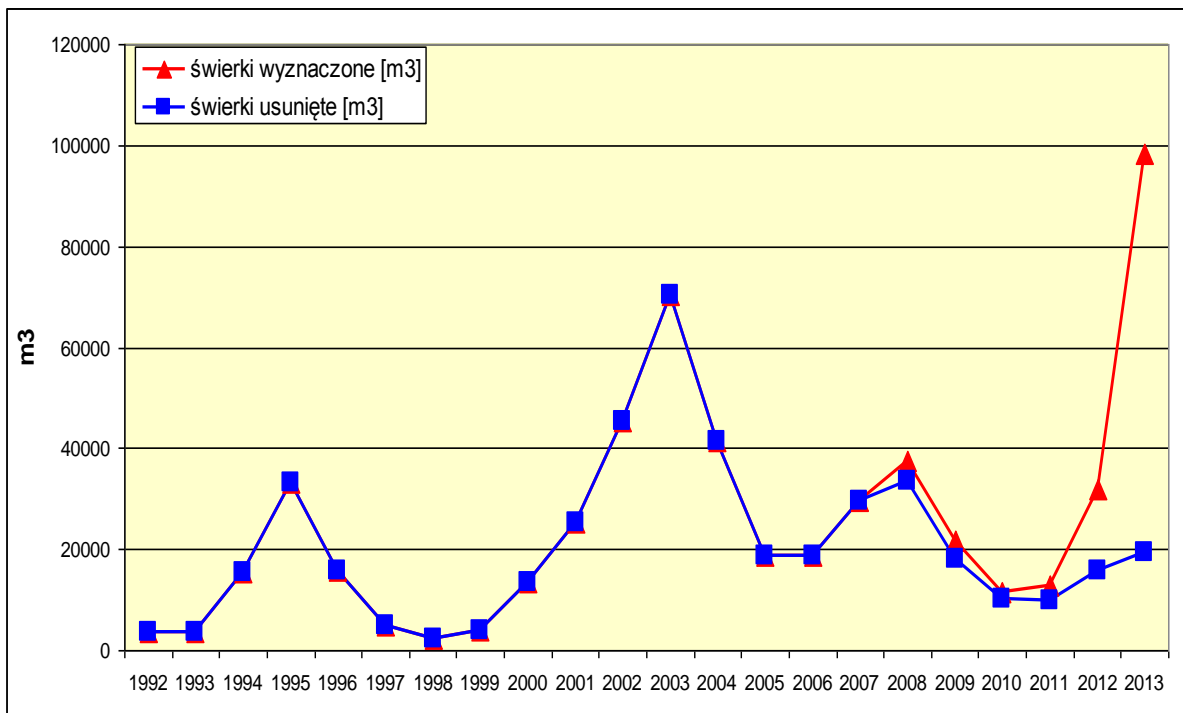
Wooden buildings and furniture accumulate CO₂ minimum 20 and more than 100 years (*sic!*)



Investigations: „Functional importance of biodiversity in European forests”
(FunDivEurope)

Results/conclusion:

1. Mixed forests of Białowieża Forest are more resistant to drought,
2. Timber production of ground part of the trees is more stable in the mixed stands



From 2012 takes gradation spruce bark beetle (in XXI age it is second one):

- 2012 – found 17 871 attacked trees (23 289 m³), cut out: 6 412 m³ (we not cut out trees in nature reserves, in the swamp forests and stands aged 100 years or more)
- 2013 – found 62 255 attacked trees (98 355 m³), cut out 19 308 m³
- 2014 – found 126 756 attacked trees (198 123m³), cut out 25 448 m³ (12,84%)

20 thousand. hectares of forest is threatened by bark beetle



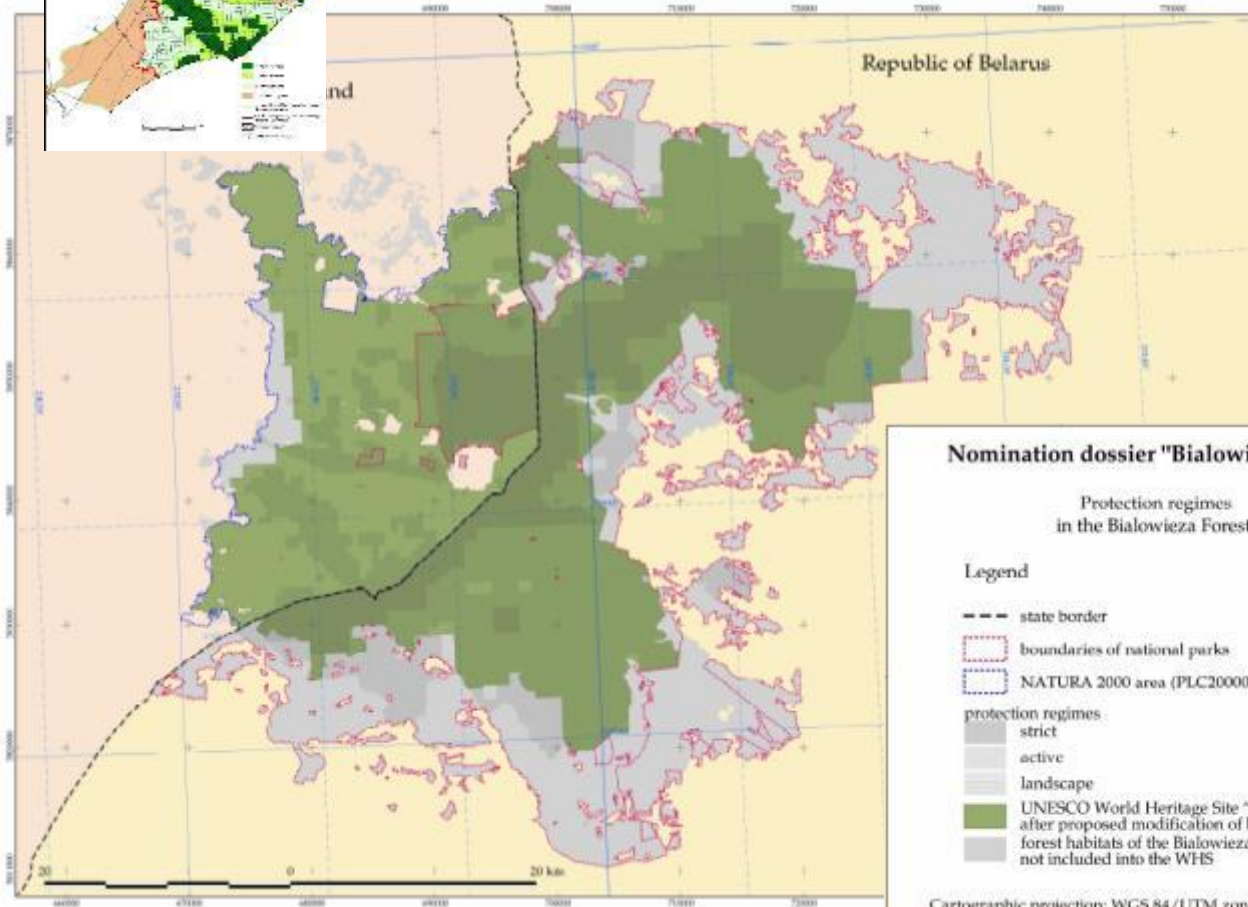
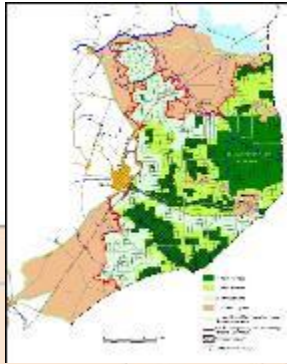
Biosfere Reserve

Transboundary World Heritage Site “Białowieża Forest”

Nominated area: **141 885** ha

Buffer zone: **166 708** ha

Total: **308 593** ha



Nomination dossier "Białowieża Forest"

Protection regimes
in the Białowieża Forest

Legend

- state border
- boundaries of national parks
- NATURA 2000 area (PLC200004)

protection regimes

- strict
- active
- landscape
- UNESCO World Heritage Site "Białowieża Forest" after proposed modification of boundaries
- forest habitats of the Białowieża Forest not included into the WHS

Cartographic projection: WGS 84/UTM zone 34N (EPSG:32634)





Educational path



Educational point



Educational path



- ca. 400 km touristic pathes and roads: (*walking, bicycles, equestrian trails, nordic-walking, ski*),
- 9 educational trails,
- 15 km narrow-gauge railway.



Tourism and social education

- Educational Center „Jagiellońskie” – Białowieża Forest District,
- Educational classroom with z Herbarium – Browsk Forest District,
- Educational classroom and points – Hajnówka Forest District.



Conclusions

Research:

- 1) wood decomposition in the forest (wood-type of stand-time),
- 2) minimal and a sufficient amount of dead wood (impact on biodiversity),
- 3) circulation of carbon in forests after gradation spruce bark beetle.





Thank you

Used materials from Hajnówka
Forest District RDSF in Białymstok ,
GDSFNH in Warsaw and
<http://www.bdl.lasy.gov.pl/porta/>