



13 gates to the forest kingdom

POLAND • THE STATE FORESTS • PROMOTIONAL FOREST COMPLEXES





to the forest **13 gates** **kingdom**

A GUIDE THROUGH THE PROMOTIONAL FOREST COMPLEXES

Text

Eugeniusz Pudlis

Editorial staff

Renata Dobrzyńska, Wawrzyniec Milewski

Designed by

Bożena Widłaszevska

Translation

Richard Biały

Photography by

Zbigniew Biliński, Paweł Fabijański,
Wojciech Gil, Krzysztof Kamiński,
Ewa Kwiecień, Grzegorz i Tomasz Kłosowscy,
Wawrzyniec Milewski, Artur Rutkowski,
Wojciech Sobociński, Sławomir Wąsik,
Andrzej Wediuk

Maps

Robert Hildebrand

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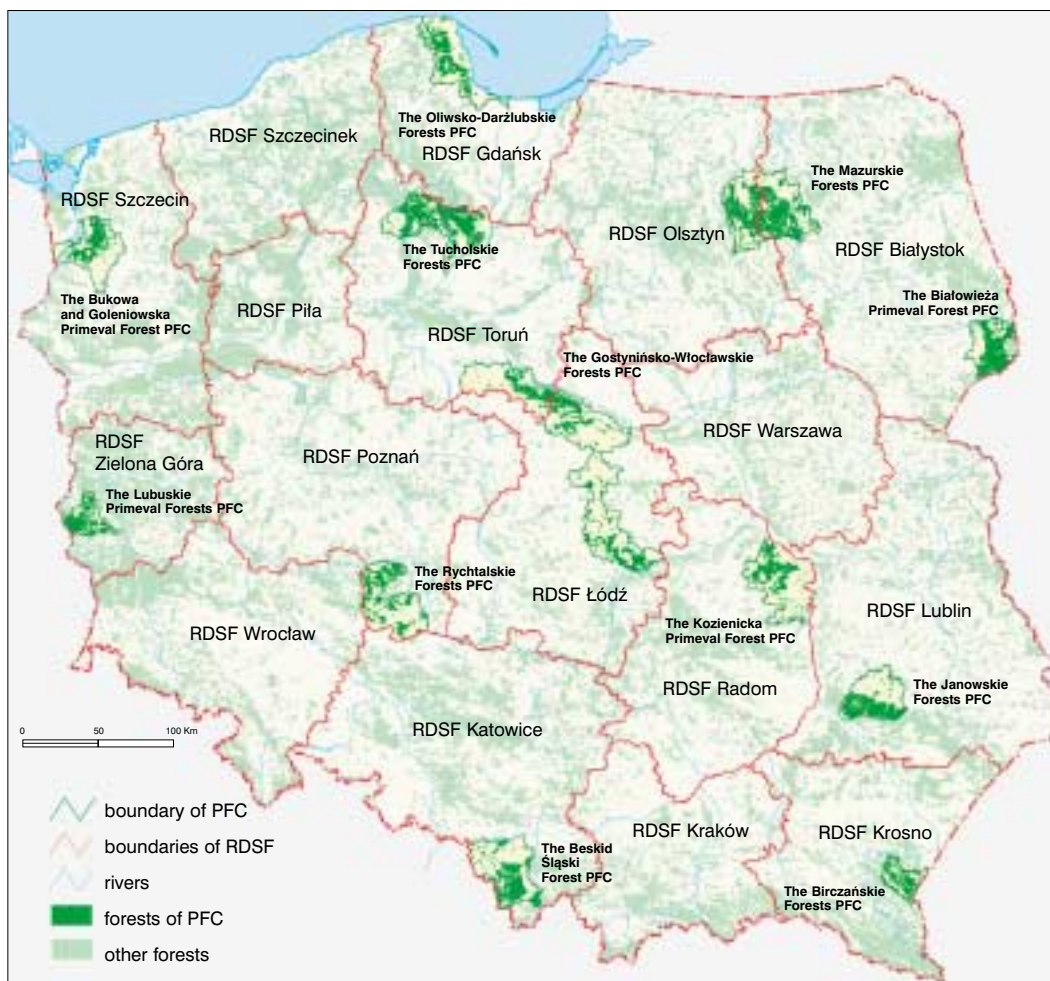
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Preface

Presenting the reader this publication, dedicated to promotional forest complexes, it must first of all be claimed with some satisfaction that in the course of the nearly ten years since it was established, this form of forestry improvement has won general approval even from far beyond the borders of our country. We must therefore express our acknowledgement and thanks to the State Forests and all their foresters, without whose efforts, the establishment, organisation and operations of the promotional forest complexes would have been impossible. The present – with the creation of additional promotional forest complexes – is a suitable moment to look back over the past ten years that have brought so many changes in our understanding of the aims of forest management and the ways these may be achieved.

As a result of two centuries of forestry development, influenced by such factors as an increasingly strong demand for timber by the mining, railway, building and chemical industries, as well as culture and learning and by many other areas of social activity, a method of forest management and economy has developed in response to such a demand – one that has been perhaps schematic, but certainly very productive. The thus simplified forest ecosystems have however lost their natural ability to maintain equilibrium. This became even more evident in the second half of the 20th century, when the negative effects, suffered by forest environments as a result of monoculture and rapid rotation of trees, were aggravated by air pollution from such sources as industry, traffic and agriculture. At the same time, a rapidly growing population, especially in the cities, brought about a change in Man's attitude to the forest, namely an increasing interest in non-wood values, perceiving it rather as the location of monuments of nature, recreation spots and aesthetic experiences.

Against this background and as forestry's answer to the challenges of civilisation, the idea of multifunctional forestry originated and was duly laid down in Polish law in the Forests Act (in 1991 and 1997), and in international agreements – such as Agenda 21 of the Earth Summit, the conventions on biological diversity and the convention on climate changes (Rio de Janeiro, 1992).

The idea of lasting and balanced development became apparent in forestry methods with the search for a compromise between timber production, the preservation of nature's values and making the forest in every respect a friendly environment for Man. The new thinking about the aims and methods of forest management was such a breakthrough that it demanded practical examples worthy of learning and imitation. In Poland, these became promotional forest complexes, propounding multifunctional forest management and responding to the idea of eco-development.

The name "promotional forest complex" officially appeared in the reasoning behind Decision No. 23 of November 8th 1994 concerning protection and management of the Białowieża Primeval Forest and issued by the Minister of Environmental Protection, Natural Resources and Forestry. Promotional forest complexes (PFCs) were formally established by Order No. 30 of the Director General of State Forests on December 19th 1994, when seven such complexes were created (the "Białowieża Primeval Forests", "Janowskie Forests", "Gostynińsko-Włocławskie Forests", "Kozienicka Primeval Forests", "Beskidu Śląskiego Forests", "Bukowa and Goleniowska Primeval Forests" and the "Lubuskie Forests"). 1996 saw the establishment of further PFCs, namely the "Tucholskie Forests", "Oliwsko-Darżlubskie Forests" and "Rychtaleskie Forests", in 2001 the "Birczańskie Forests" PFC and finally in 2002, the "Spalsko-Rogowskie Forests" PFC and the "Mazurskie Forests" PFC. In 1997, the amended law on forests qualified PFCs as an admissible organisational form of forestry in Poland – functional areas of educational and social importance, with a special and uniform, economic protection program. Promotional forest complexes thus became a tool of the Director General of State Forests in promoting a sustainable and balanced forest management and forest nature conservation.

The basic aim of promotional forest complexes is to introduce to forestry practices principles for directing its economy while totally accepting the status of and the need to fulfil nature conservation requirements. Though PFCs are sometimes perceived as "State Forests national parks", in reality they are not merely the object of conservationist protection. Rather, they are a place for implementing protection on a broad scale and, in accordance with the convention on biological diversity, for reconciling economic and conservationist goals – preserving all the organisms occurring in the forests and especially supporting those that, for different reasons, have the greatest value for Man. These include species and biocenoses along with their habitats that are protected by law or deserve legal protection.

When the woods of our promotional forest complexes gladden the visitor with their magnificent views, wealth of forms and their open access for sightseers, when professional and social education is constantly being perfected, and when at the same time the sale of timber and other products and services ensures that all or at least most of the necessary costs are covered, when all State Forest Districts finally imitate the economic and protective methods developed in the PFCs, then one will be able to claim with satisfaction that promotional forest complexes have achieved their main statutory goal.



The Tucholskie Forests

Location and general statistics

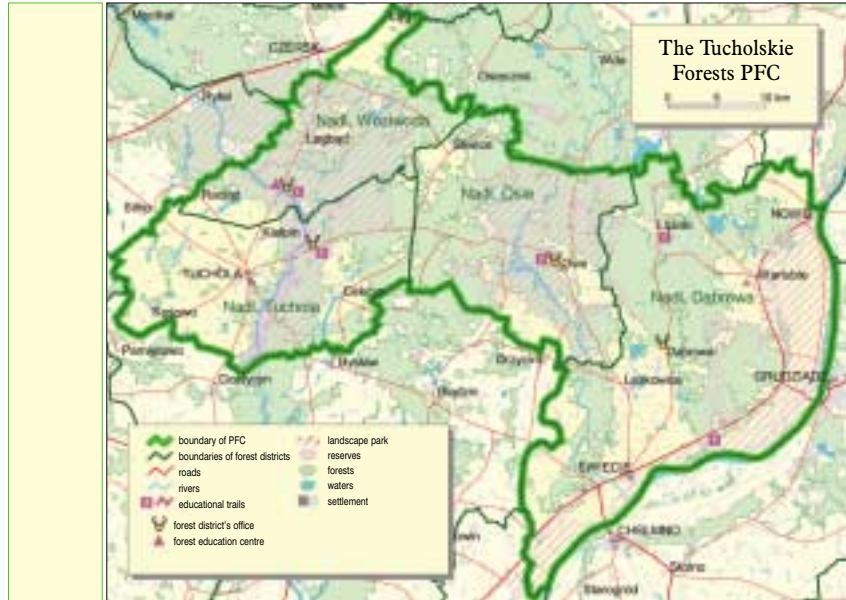
The "Tucholskie Forests" PFC occupies the south – eastern part of the Tucholskie Forests – the greatest homogeneous forest range in Poland. The acreage of this promotional complex, amounting to 84 thousand hectares, lies entirely within the borders of the Toruń Regional Directorate of State Forests and is one of the following four Forest Districts: Dąbrowa, Osie, Tuchola and Woziwoda.

Natural features and protected objects

The grounds of the "Tucholskie Forests" PFC belong to the Greater Poland and Pomerania Natural History and Forest Region. The landscape is dominated by post-glacial geological forms. These are among other things: end moraines and extensive sandy plains, also called outwashes, located on the grounds of glacial channels, whose deeper parts are filled by lakes.

The network of surface waters that constitute the numerous rivers and lakes is very extensive. The main rivers draining the Tucholskie Forests are the Brda and Wda. The central and northern section of the woods constitutes a typical lake area including approximately 50 lakes. The largest of these are: Kołębnie, Radodzież, Steklin, Wielkie Cekcyńskie, Bysławskie, Ostrowite and the artificial dam reservoir on the Wda.

Despite the predominance of poor podzolic and rusty soils, which in the southern reaches become more fertile brown and pseudopodzolic soils, the grounds of the "Tucholskie Forests" PFC woods are the habitat for all the chief types of forest that are normally met in low-lying areas. However it is only in the southern parts of the complex that one may meet forests with a more diverse composition, with the native oaks: the pendiculate and the sessile oak and more rarely beech and spruce. By far the most numerous, occupying almost 95% of the area are stands of pine, with a sporadic admixture of birch. This is the result of a certain schematic approach in the cultivation of these forests that predominated in the Tucholskie Forests in past ages. This appeared in the general application of clear fellings and the



Left:
As much as 95% of the area of the "Tucholskie Forests" PFC are covered by pine

Right:
The "Jelenia Wyspa" educational nature trail

The Tucholskie Forests



domination of coniferous species, mostly Scots pine, in the regeneration of the forest. As a result, the monoculture of pine continues to predominate today, favouring the outbreaks of pest insects, fungal diseases and exhibiting little resistance to forest fires.

This does not change the fact that the Tucholskie Forests remain one of the most beautiful and precious natural areas in Poland. This wealth lies among other things in its extensive forest complexes, lakes (among which are great rarities, the so-called lobeliaceous lakes), rivers (sometimes of a mountainous nature!), well-preserved peatbogs and numerous species of protected or rare plants and animals.

For this reason three landscape parks have been established on the grounds of the PFC – Tucholski, Wdecki and the Lower Vistula Valley, along with three areas of protected landscape – Świecki, Eastern Tucholskie Forests and Śliwicki. Of the 20 nature reserves, with a total area of nearly 27 820 hectares, the greatest number represented are – specific to this region – peatbog nature reserves (6), including the "Stążka Swamps" nature reserve, in the vicinity of which lies the "Jelenia Wyspa" forest educational nature trail and the picturesque Jeziorka Kozie, constituting a so-called educational area. Of the five forest nature reserves, particularly interesting is the "Brzęki of Zygmunt Czubiński" nature reserve, embracing a fragment of hornbeam forest with an admixture of wild service and the "Yews over Czarsk Stream" nature reserve, whose magnificent stand of yew is embraced by a protection order.

There are also over 200 protected nature monuments to be found within the borders of the "Tucholskie Forests" PFC. These are mostly single, ancient trees, groups of trees, avenues and glacial boulders. Swamps, small natural ponds, wetland enclaves deep within the forest (over 300 are recorded) are considered so-called areas of ecological utility that are priceless features contributing to the maintenance of ecological equilibrium and the biological wealth of the forest areas.

Educational features

The "Tucholskie Forests" PFC have two classrooms (at the headquarters of the Tuchola Forest District and in the grounds of the Dąbrowa Forest District, in an elementary school building in Lipinki), five educational nature trails and an education facility. This last, located at the Woziwoda Forest District, is unique in the entire country. It is composed of: a **Nature- and**

The river Brda near Woziwoda



The Nature and Forest Education Centre in the Woziwoda Forest District

Forest-related Education Centre, a Green School, an educational forest trail and several special educational areas, among them nature reserves and a green classroom beneath an ancient oak tree.

The headquarters of the Tuchola Forest District in Gołębek contains an **ecological education classroom** and a forest history classroom. In the vicinity of this Forest District, the foresters have cultivated older stand, giving it the form of a dendrology park, in which approximately 150 species and varieties of forest trees and shrubs now grow. The grounds of this park include a classroom, called the Summer Class.

After a tour of this park, one may go out for a stroll down the "**Jelenia Wyspa**" **educational nature trail**. In parts, this runs alongside the picturesque Stażki brook, close by well-preserved peatbogs as well as past sections of pine woods. At 13 different points of the 3.5 kilometre long trail, one is shown among other things the role of special bird sanctuaries, selected seed stands and a feeding area for forest game.

The grounds of the Osie Forest District include the 4-kilometre long "**Zatoki**" **educational nature trail**, leading past some particularly rich and attractive forest ranges. The visitor will learn about the

regeneration of poorer stands, the protection of forest against outbreaks of insect pests and will see the regeneration of beech and wetland habitats in the forest ranges.

The Dąbrowa Forest District has two forest educational trails. The first of these links Lipinki, a village located in a forest environment, with lake Rybno. The second, 6 kilometres from Świecie, begins at the Grabowiec forester's house and leads past a picturesque section of oak and hornbeam forest as well as maple and lime. As is self-evident, the Tucholskie Forests are dominated by pine.

The Green School in Woziwoda, situated on the Brda river, 10 kilometres from Tuchola, is located close to the headquarters of the Forest District. It has its own overnight accommodation and catering facilities, as well as a classroom with all

necessary teaching aids. It accepts groups of school children (up to 40 persons) all year round. Its education programme links natural history and forest lore with recreation: walks along the natural history and forest trails, the building of shelters in the forest, night patrols, research into the feeding grounds of beavers, laboratory research, work with microscope, aquascope, compass, binoculars, measurements of tree heights, lessons on the recreational sports trail, camp fires with roasted sausages, songs and plays and coach trips to Tucholskie Forests.

The camping site for 250 persons, located close to the Green School, is open from May to September and is equipped with a bar and all day catering, showers, a special camp-fire area, a roofed amphitheatre, a sports track and exercise equipment.

- Nadleśnictwo Dąbrowa: ul. Leśna 25, 86-131 Jezewo, tel. (052) 331-87- 13, e-mail: n-ctwo_dabrowa@pascom.pl
- Nadleśnictwo Osie: Rynek 11, 86-150 Osie, tel. (052) 332-95-03, e-mail: n-ctwo_osie@pascom.pl
- Nadleśnictwo Tuchola: Gołębek, 89-500 Tuchola, tel. (052) 334-80-05, e-mail: n-ctwo_tuchola@pascom.pl
- Nadleśnictwo Woziwoda, 89-504 Lekbąd, tel. (052) 334-15- 24, e-mail: n-ctwo-woziwoda@poczta.onet.pl
- Ośrodek Edukacji PrzyrodniczoLeśnej w Woziwodzie, 89-504 Lekbąd, tel. (052) 334-15-24
- Zielona Szkoła w Woziwodzie: ED-EKO s.c., Woziwoda, 89-504 Lekbąd, tel./fax (052) 334-34-08, e-mail: ed-eko@tuchola.pl, www.ed-eko.tuchola.pl



The Białowieża Primeval Forest

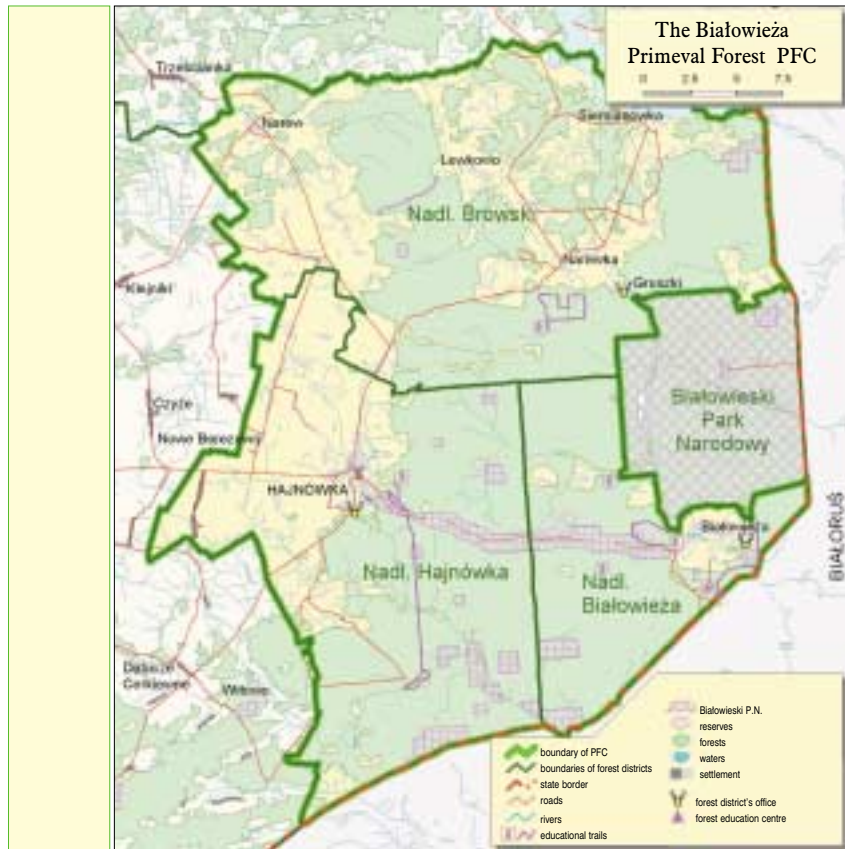
Location and general statistics

The "Białowieża Primeval Forest" PFC was established by a decision of the Director General of State Forests on the 8th of November 1994 and was the first unit of this type established in Poland. This complex embraces within its borders that section of the Białowieża Primeval Forest, whose guardians are the State Forests. Specifically, these are the three Forest Districts of the Białystok Regional Directorate of the State Forests: Białowieża, Browski and Hajnówka. PFC occupies an area of over 52 thousand hectares.

Natural features and protected objects

The "Białowieża Primeval Forest" PFC is situated in the Mazursko-Podlaski Natural Forest Region in the Białowieża Natural Forest Subregion. The geological bases of these grounds are sands laid down by retreating glaciers, often mixed with clay and in parts, moraine gravel and sand dunes. The river valleys and numerous depressions in the ground are filled with peat, boggy soils and black earth, partly silt and river sand. This unusually varied geology has resulted in a mosaic of all possible types of soil, on which rich forest habitats have established i.a. fresh broadleaved forests, mixed and moist forests, ash and alder forests with fragments of interesting bog communities, including those of a boreal nature. The stands are dominated by: pine (27.8%), spruce (24.6%), alder (19.6%), oak (11.1%) and birch (10.6%).

In spite of the many periods of intensive exploitation of the primeval forest (as early as the 15th century!), it is still one of the most precious forest complexes in the Central European Lowlands. It is home to 56 species of trees and shrubs, approximately 1,000 species of vascular plants (club-mosses, horsetails, ferns, gymno- and angiospermous plants), over 2000 species of cryptogamic plants and over 11 thousand species of animals, with the latter dominated by the world of insects (some 9 thousand species). The real pride of the forest is its bison that disappeared from this area in 1919, only to return – thanks to breeding intervention (restitution) – and roam free in 1952 (from 1929, they were raised in a special closed centre). At the



Left: Monumental oaks in the Białowieża Primeval Forest

Right: The "Jagiellonian" Forest Education Centre

The Białowieża Primeval Forest



Spruce and pine predominate among primeval forest stands

the economic activities that aim to maintain, and in places with various degrees of deformation - restore the quality of primeval forest. The silvicultural interventions that are carried out aim at protecting the biological diversity of the forest ecosystems.

Educational features

The "Jagellonian" Forest Education Centre is situated in the forest itself, 2 kilometres from the village of Podolany on Polana Białowieska. Its facilities include: a class and conference room with audio-visual equipment, a library and temporary exhibits dedicated to forestry and the work of foresters. The building also has three rooms for the accommodation of five persons.

Within a radius of several hundred metres, the Centre are includes a: "Classroom beneath the Oaks" (for conducting various open air classes), a geology educational site called the "Gravel-pit", where the student may examine a geological cross-section including a post-glacial moraine, a bird clock that shows at what hour the various "soloists" begin their forest trilling, a site for calculating the value of trees and finally a disc from an old, 250-year old oak, mute witness to many events. The Centre conducts classes popularising forestry and presents natural history documentary films about the region. It also each year organises a regional arts competition entitled "The forest as I see it".

The Forest Chamber, with its year-round overnight accommodation for 20, is located in the village of Gruszka (in the Forest District of Browsk), approximately 3 kilometres East of Narewka. It includes a classroom and an exhibition and museum room. The Forest Chamber conducts Green Classroom programs and cycle of classes entitled "Young Forester Diploma".

The Seasonal Information Point explaining the Promotional Forest Complex is located in the setting Zwierzyniec, half-way between Hajnówka and Białowieża and is open from May to September. It has been housed in the renovated carriage of a narrow-gauge railway hooked up to an antique locomotive. Here one may obtain maps, publications, folders and brochures about the forest.

Although the "**Narrow-gauge Railway Heritage Park**" (a temporary name) is in the stage of organisation it already exhibits the restored locomotives and various types of wagons for transportation of timber and people used from the World War I until 1990 and in part even today.

present moment, approximately 350 of these animals roam at liberty in three large herds in the Polish part of the Forest.

The considerable natural value of "Białowieża Primeval Forest" PFC may be seen in the fact that among other things, 20 nature reserves have been established in its grounds, with a total area of approximately 3.5 thousand hectares and the whole Białowieża Primeval Forest was embraced by the protected landscape area. There are also over 1,000 protected nature monuments and many examples of protected species of plants (i.a. orchids, club-mosses, fungi and cub-mosses) and

animals i.e. mud turtle, beaver, spotted eagle, wolf, lynx, fat dormouse).

The three Forest Districts have 43 protective zones around the nesting sites of large birds of prey and black storks, occupying altogether an area of approximately 1000 hectares. Establishing areas of ecological utility protects especially precious fragments of forest swamps and stream and river valleys – they cover an area of 671 hectares.

The habitats of the above mentioned bison as well as beavers and stands acknowledged as natural (ca 9% of the PFC's area) have also been set aside from

The Białowieża Primeval Forest

Right:
The "Royal Oaks and Great Lithuanian Princes Trail"
in the "Old Białowieża" sacred site

Bottom right:
An excursion to the primeval forest by britzkas

The "Narrow-gauge railway from Hajnówka to Topiło" and "From Hajnówka to Lipiny nature reserve" – are the unique educational nature trails. It begins at the Hajnówka narrow-gauge railway station on the western edge of the forest. The both are operative (not counting very snowy winters) all year round. At its eight stops of the trail to Topiło, one may view some of the more characteristic elements of forest natural history: hornbeam forests, peat-covered valleys, monumental oaks, pine stands and even – left by the inglorious English firm "The Century European Corporation" that exploited the forest in the years 1924-1929 – aspen and birch stands, presently being regenerated with seedlings of oak, lime, maple and elm. The railway finally arrives at the little settlement of Topiło, where one may view the water basins on the river Perebel, in which timber was once kept sunken until the moment of its transportation out of the forest. This settlement has an area for camp-fires, an open-sided roofed picnic area for anglers and a hunting lodge.

The "Curiosities of the Primeval Forest" educational nature trail, with 11 educational stopping places, runs round the above mentioned water basins presenting, on large notice boards, illustrations of the various species of animals, their feeding areas and where they rear their young and rest.

The "Scenes of the Primeval Forest" trail begins at the headquarters of the Białowieża Forest District. Along this trail, one may view among other things the results of man's activity in the environment: farmlands, a dump for rubble, former farmland since forested several or a dozen or so years ago and forest areas planted approximately 70 years ago, when there was no prohibition against planting exotic trees. This is the reason this area boasts such exotic species as: red oak, Eastern white pine and European larch. Further on, the trail runs close by a barrow, the "High Swamp" nature reserve and the valley of the river Narewka, a habitat of beavers.

Of the remaining educational nature trails, two – mapped out and laid out in 1978 – belong to the oldest in the country. These are: the "Track of the Royal Oaks and Great Lithuanian Princes" in the sacred site of "Old Białowieża" and the "Ribs of the bison" trail, connecting Białowieża with the bison display and nature reserve.



- Nadleśnictwo Białowieża: ul. Wojciechówka 4, 17-230 Białowieża, tel.: (085) 681-24-05, fax: (085) 681-24-10, e-mail: bialowieza.biuro@bialystok.lasy.gov.pl
- Nadleśnictwo Browsk: Gruszki 10, 17-220 Narewka, tel.: (085) 685-83-44, 685 85 28, fax: (085) 685-83-44, e-mail: browsk@poczta.onet.pl
- Nadleśnictwo Hajnówka: ul. Warszawska 114, 17-200 Hajnówka, tel.: (085) 683-23-78, fax: (085) 683-24-60, e-mail: kolejkilesne@wp.pl, hajnowka.biuro@bialystok.lasy.gov.pl
- Ośrodek Edukacji Leśnej "Jagiellońskie": Nadleśnictwo Białowieża, ul. Wojciechówka 4, 17-230 Białowieża, tel.: (085) 681-29-71, fax: (085) 681-24-10, e-mail: bialowieza.biuro@bialystok.lasy.gov.pl, zamojski@op.pl
- Izba Leśna: Gruszki 10, 17-220 Narewka, tel./fax: (085) 685-83-44, tel.: 685-85-28, e-mail: browsk@poczta.onet.pl



The Oliwsko-Darżlubskie Forests

Location and general statistics

The "Oliwsko-Darżlubskie Forests" PFC was established on the 1st of July 1996 and its range entirely embraces two Forest Districts: Gdańsk and Wejherowo, which come under the authority of the Gdańsk Regional Directorate of State Forests. Within the borders of the PFC are to be found: the moraine forests surrounding the Treble city (Gdańsk, Sopot, Gdynia), the Darżlubiska Primeval Forest and the coastal belt together with the Hel Peninsula and Sobieszewska Island, a total area of approximately 40.7 thousand hectares. This large forest complex lying parallel to the coast of Gdańsk Bay, also adjoins an urban agglomeration with a population of almost 1.5 million and made up of: Gdańsk, Sopot, Gdynia, Rumia, Reda, Wejherowo and Puck.

This area is located in the Baltic Natural Forest Region, whose composition includes the Subregions: Pobrzeże Słowińskie, the Drawsko-Kaszubskie Lake District and the Coastal Belt. The ground, formed during the Baltic glaciations, is dominated by uplands, cut by numerous, deep canyons and erosion valleys and by extensive proglacial stream valleys. An extremely varied hydrographic network is created by the numerous rivers (Czarna Wda, Piaśnica and Reda) and streams (Kacza, Kolibki, Kamienny Potok), flowing directly into the Baltic.

The 15 types of forest habitat are dominated by mixed and coniferous forests. The stands of trees in the "Oliwsko-Darżlubskie Forests" PFC are characterised by a considerable species variety. The main species found here include: pine and larch (58.5%), beech (27.8%), spruce (6.9%), as well as oak, maple, ash, birch and alder. The predominant forest complex is the Darżlubiska Primeval Forest, occupying approximately 17 thousand hectares. The primeval forest, rich in forest vegetation, is first and foremost covered by oak followed by beech and pine, but also areas of pure Pomeranian beech stands. It is however far from being a true primeval forest system, having been changed as early as the 12th century, when Man first began to settle this area and cut down its most beautiful oak stands for the purpose of laying out its fields.

Natural features and protected objects

The natural qualities of the "Oliwsko-Darżlubskie Forests" PFC are best seen in the 14 nature reserves found within its bor-

Left:

Natural regeneration of pine in the Darżlubiska Primeval Forest

Right:

Thicket of dwarf mountain pines on Hel. In the distance, Hel lighthouse



The Oliwsko-Darżlubskie Forests

ders, as well as its two landscape parks (Trójmiejski and Nadmorski), four areas of protected landscape (Nadmorski, the Darżlubiska Primeval Forest, the Reda and Łeba proglacial valley and Sobieszewska Island), and finally – in the nearly 200 protected nature monuments. In these areas, there are numerous stations of protected plants, such as sea holly and woodbine and such protected animal life as: white-tailed eagle, lesser spotted eagle and crane. A natural curiosity of this region is the naturally

occurring stand of Swedish whitebeam and wild service, both under strict protection.

Virtually all eight of the nature reserves found within the borders of the Gdańsk and 6 of the Wejherowo Forest District can boast natural qualities and unrepeatable beauty. For example the "Lewice" reserve protects peatbog communities, "Pałecznicza" – forest oligotrophic lakes, "Bird's Paradise" – the lake being the breeding grounds for waterfowl at the mouth of the Vistula Śmiała River where it joins Baltic. The "Piaśnickie

Meadows" floristic reserve protects the Atlantic vegetation growing on natural peat-bogs and the "Bielawa" reserve with extensive boggy areas and marshy meadows – a habitat of crane, sandpiper and marsh harrier. The "Rozewie Cape" reserve with its cliff slopes covered by a 150-year old stand of trees, or the "Salty Meadows" the base of Hel spit, with its halophilous vegetation constitute the real pearls of this Baltic PFC.

Educational features

This area so diverse in its natural history appears considerably richer in tourist and recreational resources than in educational resources. In the whole Baltic PFC, there are over 20 forest parking spots, with 30 full-time vehicle parks, 8 rest areas and 3 camping sites. The population of the treble city also have a choice of five walking trails, almost 450 kilometres of tourist tracks, bicycle trails of approximately 84 kilometres in length, five equestrian routes (a total of 23 kilometres) and a dozen or so kilometres of forest paths that also fulfil the role of overland ski-routes.

Left:

Dunes along a coastal belt

Bottom:

The Baltic coast near Władysławowo



The Oliwsko-Darżlubskie Forests



A horseback ride along the edge of the sea

Educational features include two natural history and forest rooms, three educational nature trails and two arboreta established near the headquarters of the Forest Districts. **The "Muza" Nature and Forest Chamber** is located in the Wejherowo Forest District, in a building adapted to this purpose in the Muza Forest Sub-district, situated 6 kilometres from the centre of Wejherowo, on the road to Krokowa. This facility has permanent exhibitions of flora and fauna, forest management of the PFC, a reading-room, exercise room, educational show-cases (among other things a cone display, a collection of leafy and coniferous tree and shrub seeds, samples of woods, tree and shrub shoots).

The "Muza" Chamber is at the same time the first stopping place on the **"Darżlubska Primeval Forest" educational forest trail**. This trail is 4 kilometres long. The time it takes to cover its 10 stopping places (the last is already in the Kępino Forest Sub-district) amounts to approximately 3.5 hours. On the way, sightseers will among other things learn about a plantation of Christmas trees, transformation of stands, a partitioning of forest areas, protection of the forest from insects (pheromone traps), game manage-

ment (a game feeding area, a feeding rack and a fodder cellar), as well as small-size water retention.

The "Reda Valley" educational nature trail is located 2 kilometres from Wejherowo in the Orzeł Forest Sub-district. On its 13 stopping places, sightseers have the opportunity to see among other things the Reda river valley, a forest spring, afforestation of former farmlands, a riparian forest, a meadow deep within the forest, different forest layers and the transformation of a stand – presented in the context of the forest management conducted in PFC.

The second Nature and Forest Chamber in the "Oliwsko-Darżlubskie Forests" PFC is located at the headquarters of the Gdańsk Forest District – in Gdynia, on ul., Morska 200. Among other things, this contains permanent displays connected with forest management and the history of the Forest District, of fauna and flora, as well as soil profiles from selected forest ecosystems, sections of trunks from forest trees, an

interesting collection of toys made of wood and collections of forest insects. Reservations should be made by telephone at the Forest District.

The "Lasy Chylońskie" educational forest trail is located just one kilometre from Gdynia Chylonia, on the grounds of the Cisowa Forest Sub-district. The route of this trail, with its eight stopping places, is marked out in red and is 2.5 kilometres in length. It takes approximately 3 hours to cover the trail, which passes through the most precious and most diverse forest grounds, typical for the Gdańsk Uplands ridge zone. The variation in the areas where different types of vegetation occur is due to the considerably varied sculpture of the land. The slopes of elevations in the land are occupied by lowland acidic beech stands, the slopes of knolls are covered by beech and oak forest, higher terraces over streams (among others, the Marszewska Stream) are the habitat of hornbeam forests with a mixture of oak.

- **Nadleśnictwo Wejherowo: ul. Sobieskiego 247B, 84-200 Wejherowo, tel. (058) 672-98-01 (to 06), fax (058) 672-98-01, e-mail: wejherowo@lasypanstwowe.gdansk.pl, web site: www.lasypanstwowe.gdansk.pl**
- **Nadleśnictwo Gdańsk: ul. Morska 200, 81-006 Gdynia, tel. (058) 663-23-32, fax (058) 663-14-24, e-mail: gdansk@lasypanstwowe.gdansk.pl, web site: www.gdansk.lasypanstwowe.gdansk.pl**



The Rychtalskie Forests

Location and general statistics

The "Rychtalskie Forests" PFC is situated in southern Greater Poland and stretches between Ostrów Wielkopolski, Kluczbork, Oleśnica and Wieruszowo on an area of 48 thousand hectares, within the borders of the Poznan Regional Directorate of State Forests and the Forest Experimental Station in Siemianice. Apart from the Wzgórze Ostrzeszowskie hills that reach their highest point in Kobyła Góra (284 metres above sea level), these grounds are generally quite flat. Two Forest Districts are found within the borders of this PFC: Antonin and Syców and also the entire acreage of the Forest Experimental Station in Siemianice, a department of the Agricultural Academy in Poznan.

The predominant soils here were formed from post-glacial compositions (mostly podzolic soils), but along the numerous rivers (Prosna, the river-basin of the Oder between Barycza and Widawa), the stands are very varied, thanks to the more fertile habitats. This PFC owes its name to the very well known and valuable ecotype of Scots pine growing in parts of the Syców Forest District around Rychtal. It is precisely here that

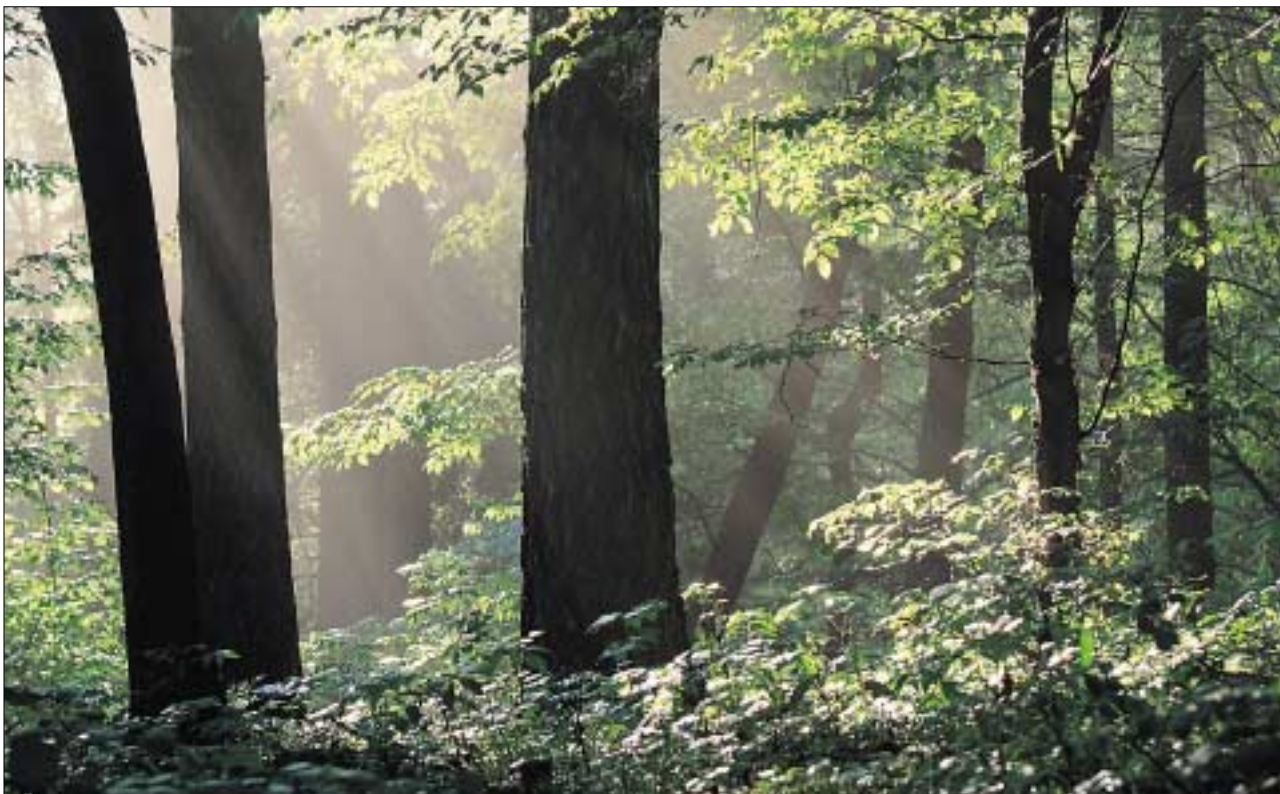


Left:

A pine stand in the Antonin Forest District

Bottom:

The stands in the Siemianice FES have the richest species composition



The Rychtalskie Forests



Top:
A common swamp in the "Black Horse" nature reserve

Left:
We all know this: best rest is in the forest

a seed zone has been established, consisting of 64 Scots pine plus trees, four black pines and one larch. The forest habitats of the Antonin Forest District are first and foremost covered in pine (93%). Stands in the Syców Forest District represent more rich species composition. The richest species composition is found in the stands in the Siemianice FES, where along with pine, the stand also includes oak (12.3%), alder (8.6%) and birch (7.5%) as well as larch, beech, hornbeam and ash.

Natural features and protected objects

Six forest nature reserves (with an area of over 76 hectares) are located in the grounds of "Rychtalskie Forests" PFC, along with one archaeological nature reserve. 148 trees (including 63 pendiculate oaks) have been recorded as protected nature monuments; tens of other await to be embraced by this form of protection. Two further floristic reserves are in the planning phase, namely: the "Black Horse" reserve covering an area of 17.5 hectares – for maintaining occurrences

The Rychtalskie Forests

Right:
The "Rychtalskie Forests" PFC deserves its name to the precious Scots pine ecotype

Bottom:
Great spotted woodpecker

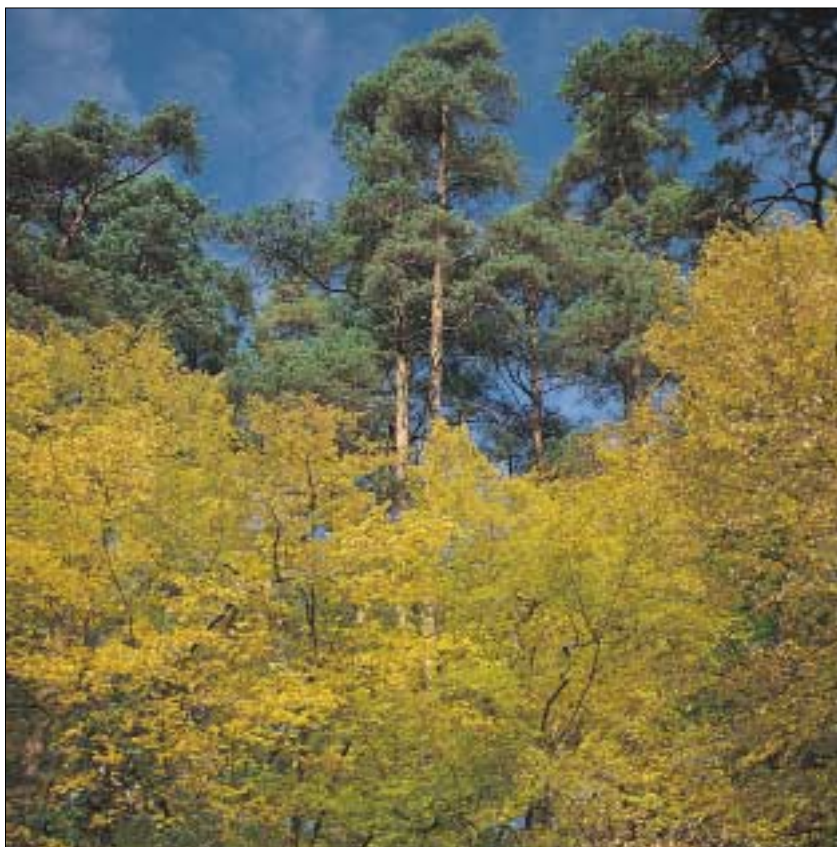
of roundleaf sundew, a transition peatbog and an old stand of pine, and secondly the "Dąbrowa" floristic and forest reserve in Sośnie Ostrowskie covering an area of 30 hectares – with a stand of blooming common ivy and a fragment of hornbeam wood.

Established in 1996 and embracing part of the Antonin Forest District's forests, the "Dolina Baryczy" Landscape Park protects spruce, fir and beech stands that grow here on the border of their natural ranges. Since 1995, parts of the Syców and Antonin Forest Districts have included an Area of Protected Landscape called the "Ostrzeszowskie Hills and Odolanowska Valley" and since 1996, they have also included the "River Proсна Valley" in the Siemianice FES.

The protected plants growing on the grounds of the "Rychtalskie Forests" PFC include royal fern, roundleaf sundew, club-mosses, stitchwort, brittle blade-fern, violet *Viola epipsila*, green reindeer lichen, Fuchsii ragwort and February daphne.

Educational features

The Forest Classroom is a facility near Laski where lessons about the forest and its inhabitants have been held since 1998, directly beneath the eaves of the trees and close to the arboretum. These classes for school children are conducted by the foresters. The nearby student's boarding-school (with overnight accommodation for one hundred students) makes it possible to conduct program during longer stays in the so-called Green School. Within a radius of 14 kilometres from the Forest Classes, there is a host of



natural attractions, including among other things a farm rearing wild ponies in Marianka Siemieńska, the "Old Beech" nature reserve in Raków, the "Alder Carr in the Pomianka Valley" nature reserve, as well as the palace and park complex at Siemianice.

The educational nature trail in the "Wydymacz" nature reserve is 3 kilometres long. The actual nature reserve, established in 1987, consists of forests occupying 35.13 hectares and a fishpond with an area of 10.80 hectares (the property of the State Treasury Fish Farm in Przygodzice). This nature reserve includes among other things: an alder-ash forest complex, many species of protected plants and monumental trees, including eastern hemlock, Lawson cypress, locust and red oak. Representatives of fauna include 17 species of breeding birds (among others: marsh harrier, greater spotted woodpecker, great reed warbler) and such ani-

mals as wild boar, hedgehog, roe deer, fox and river-crayfish. All these may be seen at the seven sites of this trail. Catering facilities are located in the Hunting Palace in Antonin and in the "Lido" recreational complex.

The "Ogrodówka" Education Chamber located in the Antonin Forest District has a permanent exhibition "Meeting the Forest" designed for children of primary and secondary schools. Educational training courses for teachers are also carried out in the Chamber to prepare them for individual work in the "Ogrodówka".

The "Forest Arboretum" of Prof. Stefan Białobok established in the Syców Forest District in November 1993 jointly with the so-called Green Classes and roofed facility can serve in conducting classes. **The "Stradomia" educational trail** established in the Syców Forest District is 4 kilometres long and contains 14 stopping places with information boards.



- Nadleśnictwo Antonin: 63- 422 Antonin, tel. (062) 734-81-24, fax (062) 734-81-28, web site under construction
- Nadleśnictwo Syców: ul. Kolejowa 14, 56-500 Syców, tel. (062) 786-21-27, fax (062) 785-29-75, web site under construction
- Arboretum Leśne im. Prof. Dr Stefana Białoboka przy Nadleśnictwie Syców, tel. (062) 785-13-25
- Leśny Zakład Doświadczalny: Siemianice 106, 63-645 Łąka Opatowska, ul. Kasztanowa 1, tel. (062) 782-64-00, fax (062) 786-90-32, e-mail: siemian@owl.au.poznan.pl
- Klasa Leśna w Laskach: tel. (062) 781-83-88



The Bukowa and Goleniowska Primeval Forests

Location and general statistics

The "Bukowa and Goleniowska Primeval Forests" PFC is situated in approximately 30 kilometres to the south-east of Szczecin and embraces the whole of the Bukowa Primeval Forest and the southern part of the Goleniowska Primeval Forest. Established on July 1st 1996 on the grounds of the Szczecin Regional Directorate of State Forests, it occupies the entire acreage of Kliniska Forest District and the limits of the Rozdoly range belonging to the Gryfino Forest District. The total area of the PFC amounts to 32.8 thousand hectares.

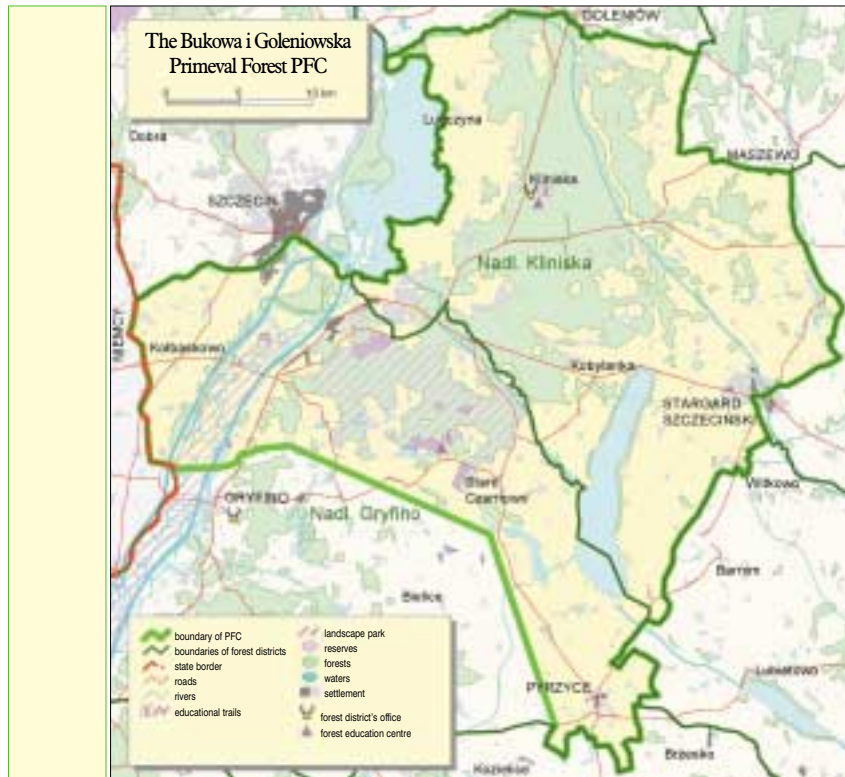
The rich hydrographical network (the river-basin of the Oder, as well as the Ina and Płona and lake Miedwie) and the fact that this is one of the warmer regions of Poland (with an average annual temperature of 8.3°C) have meant that all types of forest for lowland habitats occur here. In the Bukowa Primeval Forest over half of the stands of trees are beech (followed by oak and alder) and in the Goleniowska Primeval Forest, pine reigns supreme (89%).

The "Bukowa and Goleniowska Primeval Forests" PFC are a habitat for many rare plants and animals. Among others to nest here are: white-tailed eagle, black stork, black and red kite and lesser spotted eagle. There are also almost 30 species of protected plants, among other things wild service, Pomeranian woodbine, purple Turk's cap lily and 18 species of orchids.

Natural features and protected objects

The scenic and natural qualities of these grounds located south-east of Szczecin were the reason behind the establishment of the "Beech Forest" Szczecin Landscape Park and the "Lower Oder Valley" Landscape Park, whose northern section lies within the borders of this PFC.

Within the "Bukowa and Goleniowska Primeval Forests" PFC's borders are seven nature reserves that altogether occupy an area of over 504 hectares. Five of these are forest nature reserves, connected with stands of beech as their names testify: the "Prof. T. Dominik Beech Springs", "Beech Ravines", the "J. Jachowski Spring Beech" and the "S. Kownas Grassy Beech Wood". The fifth beech nature reserve is the "J. Lewandowski Kołowskie Parowy".



Left:
Autumn in the Bukowa Primeval Forest

Right:
Preparations for natural regeneration of pine in the Gryfino Forest District

The Bukowa and Goleniowska Primeval Forests



The two remaining nature reserves are the landscape "Wzgórze Widokowe nad Międzyodrzem" and the "Kurowskie Błota" ornithological reserves.

A place with especially precious natural history value is the Dendrological Garden in Glinna. On an area of nearly 4 hectares, it holds over 1000 specimens of trees and shrubs, amounting to 470 species and varieties originating from Europe, Africa, Asia and both Americas. The most precious trees include a 30-year old giant sequoia (unfortunately, the largest and oldest, approximately 120-year old specimen of giant sequoia in Poland has died in consequence of freezing temperatures and the activities of the honey fungus), an 180-year old big bud hickory, a 120-year old silver fir and a 30-year old dawn redwood. Among the shrubs deserving special attention is a collection of 15 species and varieties of magnolia and five species of "stewarcja" from South-east Asia.

Educational features

The Nature and Forest Education Centre of the Kliniska Forest District is situated approximately 30 kilometres from the centre of Szczecin, on the A3 international highway: Scandinavia – Poland – Germany. The Centres main operations include conducting small group and outdoor classes for children and young people, method workshops for teachers, lectures, seminars and conferences.

The facility has at its disposal a conference and teaching hall that sits 100 persons (with audio-visual equipment and a computer – with the possibility to project images onto a large screen and with access to the Internet), exhibition rooms (with interchangeable natural history exhibitions) and a library. Additional teaching resources are its botanical and entomology show-cases, herbariums, magnifying glasses, binoculars etc.

Close to the Centre is an instructional square with special visual instruction boards illustrating the functioning, threats to and protection of forest ecosystems, an umbrella roofed area with a place for a camp-fire, playgrounds, a 3 kilometre-long educational and walks trail with 14 stopping places presenting the basic rules for management and protection of coniferous stands in woodland habitats and an approximately 50 kilometre-long bicycle trail linking both forests, as well as a catering facility and a car park.

This facility is built without any so-called architectural barriers, thanks to which it is easily accessible for the handicapped.

**Pine reigns supreme (89%)
in the Goleniowska Primeval Forest**

The Bukowa and Goleniowska Primeval Forests



Left:
120-year old giant sequoia
in the Dendrological Garden in Glinna

Bottom left:
A Forest Educational Information Point in Glinna

The nature and forest information point in Glinna (at the Gryfino Forest District) is situated approximately 20 kilometres from Gryfino and 25 kilometres from Szczecin, in the village of Glinna, on the main Gryfino – Stare Czarnowo highway. This information point's chief activities are outdoor classes for children and young people, the organisation of competitions and the provision of information about the area.

The point is composed of: an open-sided umbrella roofed area for approximately 100 persons, a catering facility around a central fire-place, educational and playgrounds, parking space and a camp-fire area. Directly adjacent is a Dendrology Garden and the starting point for both an educational and bicycle trail.

The "In Search of Green Land's Mysteries" educational nature trail in Glinna introduces the visitor to some of the plant communities occurring in the Bukowa Primeval Forests. Its chief value lies in the possibility to see behind the scenes and learn about forest management in a forest serving several functions.

The trail is approximately 4 kilometres long and it takes approximately 2-3 hours to walk. The trail consists of 12 stopping places. The first of these is the Dendrology Garden, followed by the "Forest ABC...", "Functions of forest ecosystems", "Conservation of natural richness of forests", "Soil pit", "Forest protection", "Seed management", "From seed to green giant", "One step before nature", "Small-size water storage", "A chlorophyllous world of the Beech Primeval Forest", "The world of animals and management of their resources".

The facility is open all year round – from dawn to dusk. The activities are carried out from March to November. Guides are available from the guardian of the Dendrology Garden or in the Gryfino Forest District headquarters.



- **Nadleśnictwo Gryfino:**
74-100 Gryfino, ul. 1 Maja 4,
tel./fax (091) 416-20-71,
(091) 416-30-42
- **Nadleśnictwo Kliniska:**
72-123 Kliniska, Pucko 1,
tel. (091) 418-14-89, 418-14-70,
fax (091) 418-15-60,
e-mail: las@nadlesnictwo-kliniska.pl



The Gostynińsko-Włocławskie Forests

Location and general statistics

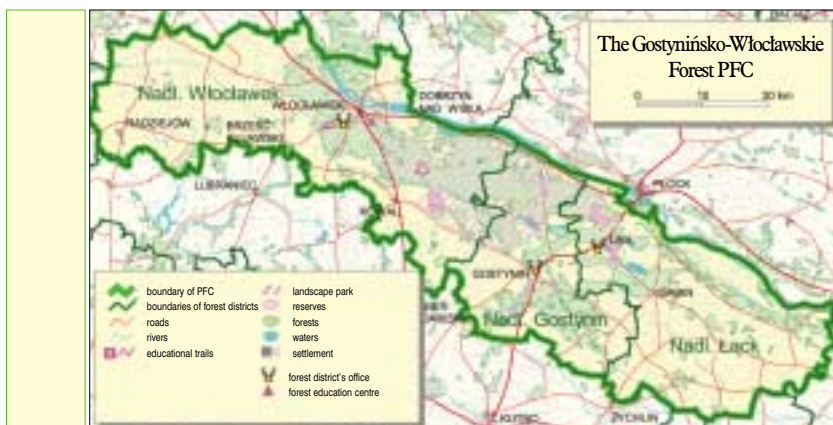
Situated on an area of dune terraces of the Vistula, the "Gostynińsko-Włocławskie Forests" PFC forms the only homogeneous forest complex in the vicinity of Kujawy and Mazowsze. Occupying an area of 52.2 thousand hectares, this PFC is composed of the three Forest Districts of two regional directorates of the State Forests: Łódź (the Gostynin and Łąck Forest Districts) and Toruń (the Włocławek Forest Districts).

The "Gostynińsko-Włocławskie Forests" PFC is situated within the limits of two Natural Forest Regions: the Wielkopolsko-Pomorski and the Mazowiecko-Podlaski. The hydrographical network is in its entirety formed by the river-basin of the Vistula, specifically the Vistula itself with the dam in Włocławek (stretching from Plock for approximately 50 kilometres) and numerous lakes, the largest of these being the: Zdvorskie, Rakutowskie, Lucieńskie, Białe and Wikaryjskie. The soils are mostly podzolic and rusty, on which the dominant vegetation is coniferous forest. The species composition of stands (with an average age of 52) is led by pine – over 89%, the remaining species being alder (4.9%), oak (2.8%) and birch (1.9%).

Natural features and protected objects

Perhaps the greatest wealth of the "Gostynińsko-Włocławskie Forests" PFC is the varied and picturesque forms of scenery. These are formed by among other things: the Vistula valley in the region of Włocławek, the northern section of the Jedwabno and Czarne forest range, the depression in the landscape in the region of lake Rakutowskie, the valleys of the rivers Skrwa and Osetnica and most of the lakes in the area.

Within the borders of the PFC are 16 nature reserves with a total area of over 1,5 thousand hectares. 11 of these are forest nature reserves, five (the "Komory", "Lucień" and "Lubaty" in the Gostynin Forest District and the "Dąbrowa Łącka" and "Jastrzębek" in the Łąck Forest District) – nature reserves made up of lakes and forest. Approximately 60% of the area of the Włocławek, Gostynin and Łąck Forest Districts are taken up by the Włocławski Landscape Park. The grounds of this PFC also enclose the Gostynin and Gąbin Area of Protected



Landscape. Within the borders of the above mentioned facilities are 60 marked out protected nature monuments. This special protection embraces: 16 nests and breeding grounds of black stork, crane, white-tailed eagle, peregrine falcon and other birds of prey as well as three beaver habitats and flora sites with 50 species of protected and rare plants.

Nearly half of the forest (49.8%) lying within the borders of the "Gostynińsko-Włocławskie Forests" PFC is in the form of forest complexes carrying out various protective functions.

Educational features

The grounds of the Promotional Forest Complex contain one forest chamber and four educational trails.

The Łąck Forest District educational trail begins at the headquarters of the Forest

District. On this 5 kilometre route, the first of the 12 stopping places is a forest and ecological education chamber (with numerous exhibits including: samples of wood, herbariums, insects and fungi), the Natural History Museum and an antique seed extracting machine. Special signposts assist the visitor along the route, on which he may meet among other things: an oak wood, a fragment of a spruce stand and a mixed forest (a dense impenetrable forest made up of many layers). The next stopping places present among other things the manner of managing mature trees, a swamp deep within the forest and the expansion of oak in a pine stand. The seventh stopping place is the "Łąck" sanctuary, where almost twenty-year old pine and oak create the climate of the forest that still grew all over the Mazovia region in the middle of the 19th century. The trail ends in the village of Grabina on lake Górski, the

Left:
no-year-old pines
in the Łąck Forest District

Right:
Avisit of foresters in the Gostynin Forest District



The Gostynińsko-Włocławskie Forests



The Gostynińsko-Włocławskie Forests

twelfth stopping place entitled "Man's various attitudes to nature", in a place where one may see among other things an oil pipeline, an asphalt road, holiday centres, a beach on the lake and the highway between Gostynin and Płock.

The "Lucień" educational forest trail (in the Gostynin Forest District) begins at the village of Lucień, situated on the river Skrwa, between the lakes Białe and Lucień. The route is 3 kilometres long and leads along the south-west bank of lake Lucień, next to rich stands of trees, some of which are of natural origin. Each of the seven stopping places has an information board describing the surrounding environment. Stopping place No 1 is a park founded in the 19th century in a scenic style. After the war, this went unattended and became transformed into a forest, but traces of the former spatial arrangement of the park are still visible down its hornbeam avenue. There are also: handsome specimens of red beech, eleven protected nature monuments and an official's building. The next stopping places are the "Komory" nature reserve (this protects part of lake Lucień, an adjacent belt of alder swamps and marshy meadows), the "Jan" oak – a monumental tree with an estimated age of 300, a height of 20 metres and a girth of 500 cm. The trail ends at the stopping place called "Man and nature", where discussion centres on the threats to the Gostynin forests, among other things the emissions of sulphur dioxide, the fluctuation in ground water, the outbreaks of insects and pathogenic fungi, namely the honey fungus and the root-rot fungus.

The "Kukawy" educational trail (the Włocławek Forest District) is situated in the grounds of the Przyborowo Forest Sub-district, 5.5 kilometres from Kowal. There are nine nature education stopping places on the route of this 3.5 kilometre-long trail, intended exclusively for walkers. This walk (depending on its purpose) takes from 3 to 5 hours.

The first stopping place on the trail is the Kukawy forest nursery, with a car park located close-by. The next stopping places present forest cultivation on land previously destroyed by fire, various types of stands, the different phases of development in pine stands and an area of ecological utility. These last two are connected with lake



Dzilno, a small, overgrown reservoir of post-glacial origin. On the lake itself, one may trace the zoned arrangement of vegetation that passes from water-level vegetation through rush-type vegetation, osier thicket, to alder carr and marshy meadows; these last create typical forest communities and are the last stopping place of the trail.

The "Łuba" educational forest trail (the Włocławek Forest District), is situated in the Brześć Kujawski Forest Sub-district, a short distance from the borders of Włocławek. The route is 5 kilometres long. It consists of 12 stopping places. The trail may be joined at the headquarters of the Forest Sub-district – a stylised landowner's palace on ul. Ziębia 13, in the vicinity of which information boards, wooden tables and benches have been installed. One can stop here to have a rest and listen to a lecture about the natural history and about the history of the forests around Włocławek in particular.

The first stopping place is a culvert on a small stream – an example of small-scale water storage. The next stopping places are among other: a so-called point of biological resistance (an empty space in a pine stand, sown with leguminous plants and attracting beneficial insects), the valley of Zgłowiączka brook, regeneration of forest after a fire and an area for providing game with additional food. Further along are found: lake Łuba – a 12 hectare water reservoir with no outlet, maximum depth 25 m, a camping site (with wooden roofed areas and a camp-fire area), a pine old-growth with traces of resin tapping – an example of the way forests were used in the past. This interesting and varied trail finishes at a forest refuge – grounds planted with shrubs that provide berries and nectar, where feeding troughs, nesting boxes and a water supply have been installed for the animals.

Top left:

Pine is the main species in stand composition (more than 89%)

Left:

A stopping place on the educational nature trail in the Łąck Forest District

Top right:

„Little and large”.

- Nadleśnictwo Gostynin: 09-500 Gostynin, ul. Bierzewicka 55, tel. (024) 235-30-56, fax (024) 235-30-56, e-mail: gostynin@lasy.com.pl
- Nadleśnictwo Łąck: 09-520 Łąck, ul. Lipowa 4, tel. (024) 261-40-01, fax (024) 262-88-84, e-mail: lack@lasy.com.pl
- Nadleśnictwo Włocławek: 87-800 Włocławek, ul. Ziębia 13, tel. (054) 234-98-00, fax (054) 234-92-81, wloclawek@rdlp.torun.pl



The Kozienicka Primeval Forest

Location and general statistics

The "Kozienicka Primeval Forest" PFC was established within the borders of three Forest Districts belonging to the Radom Regional Directorate of State Forests: Radom, Kozienice and Zwolen. It occupies an area of 34 thousand hectares. The Kozienicka Primeval Forest constitutes a section of the former Radom Primeval Forest that once stretched between the Vistula, Pilica and Kamienna rivers and is still one of the largest forest complexes to have retained to a considerable degree its natural state, in all of central Poland. The greater part of the PFC is situated in the Natural-Forest Region of the Central Polish Uplands. Its whole area lies in the Vistula basin, into which flow the numerous rivers that criss-cross the forest, including the: Ostrownica, Brzezniczka, Zagozdzonka, Pacynka and Zwolenka.

The composition of the stands is dominated by pine (almost 84%). Pine as the prevalent species, mostly forms mixed stands with pendiculate and sessile oak. The proportion of oak in the forest stands amounts to 5.5%, alder – 4.7%, silver fir that occurs here on the border of its range – 3.2% and birch – 1.9%. The numerous other admixture species include: larch, spruce, hornbeam, aspen, sycamore, maple, linden-tree, beech, ash and elms. The understorey includes the species: hazel, alder buckthorn, juniper, spindle tree, barberry and others.



Natural features and protected objects

The herbaceous layer of the forest floor includes over 40 protected species, among such as February daphne, common ivy, common club moss, columbine, anemone, sundew, numerous species of orchids as well as the strictly protected fungi: common morel, *Morchella conica*, crested sparassis and stinkhorn.

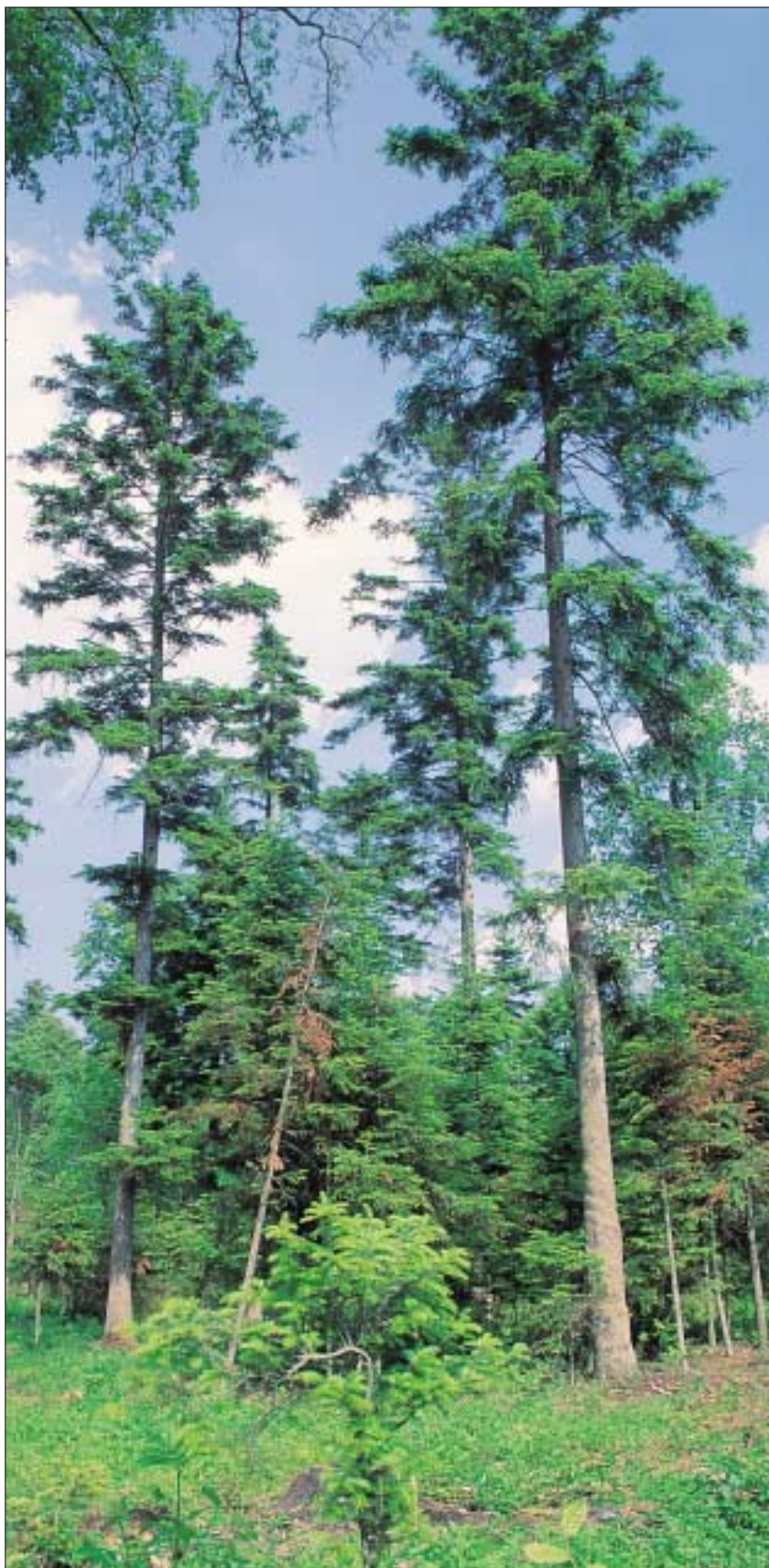
Besides numerous areas containing protected plants, the grounds of this PFC also include: the Kozienicki Landscape Park, 170 protected natural features and – in an area of over 110 hectares – 13, mostly forest-type, nature reserves. Each of them is an unrepeatable pearl of natural history. For example, the "Zagozdzon" nature reserve, the oldest in the forest (established in 1962), is made up of protected fir and hornbeam woods aged between 80 and 160 years. In turn, the "Teodor Ziełiński Ponty" nature reserve, situated in the central part of the Kozienicka Primeval Forest, is com-

Left:
The "Pionki" nature reserve



Right:
In the "Zagozdzon" nature reserve

The Kozienicka Primeval Forest



posed of stands of silver fir and pendiculate oak, while in the herbaceous layer of the forest floor, one may observe among other things: hepatica, lungwort *Pulmonaria obscura*, wood anemone. There is a stand of trees in the northern section of the "Brzeziczka" nature reserve that includes approximately 140-year old Polish larch. The oldest tree of all in the forest is growing in the "Zagożdżon" nature reserve – an oak called "Zygmunt August" whose age is estimated at 350.

The "Kozienicka Primeval Forest" PFC has over 50 species of mammals including beaver, as well as such predators as fox, raccoon dog and badger. Over 200 species of birds also live in this forest (corn crane, woodcock, kingfisher, Savi's warbler, babblers bearded tit) and including approximately 150 nesting species. Among the 16 species of bats occurring here are such "rarities" as Brandt's and Bechstein's bats.

Educational features

Selected seed stands have been marked out on the grounds of the PFC for pine, oak and alder and in 1996, a modern seed store was opened. This makes it possible to regenerate the main species that make up the primeval forest. Transformation of stands involves increasing the proportion of fir and beech. On every area that is cut, the foresters leave 5% of the healthy trees to grow to a natural old age in the form of groups or clumps with natural shrub layer and undergrowth. One may get a "taste" of this manner of PFC management by touring one of the two educational centres or wandering down any of the eight educational nature trails.

The State Forests Ecological Education and European Integration Centre in Jedlna Letnisko houses a permanent exhibition of harmful forest activities – with poacher's tools that were found in the forests. The Centre conducts professional training courses for foresters and organises forest management and nature protection workshops for schools. It has a library, a forest shop and a hotel with 140 beds and provides all-day catering services.

The Education and Museum Chamber in Augustów was established by the Kozienicki Landscape Park and Kozienice Forest District. Here, issues relating to the history, culture and tradition of the forest are presented.

The "Jedlnia" educational nature trail begins at the entrance gate to the State Forests Centre in Jedlnia Letnisko. Marked out in green and white, it consists of eight stopping places and permits the visitor – in the course of about two hours – to learn about a multi-functional forest manage-

Firs in the Kozienicka Primeval Forest

The Kozienicka Primeval Forest



The "Brzeźniczka" nature reserve

ment what lies behind such terms as biological diversity, ecosystem, natural regeneration etc. And thus, at the second stopping place, from beneath an ancient and magnificent oak, one may observe the characteristic features of an ecotone – the transitional zone between two ecosystems, in this case the forest and field ecosystems. The sixth stopping place is the "Siczki" 35-hectare water storage reservoir on the river Gzówka that among other things slows the outflow of water and has a positive effect on the microclimate, ensuring conditions for the existence of waterfowl. A splendid lesson in forestry and ecology!

The "Krępiec" nature and landscape trail runs through a fragment of the Garbatka forest range of the Zwoleń Forest District, a partial forest and landscape nature reserve with an area of 278.9 hectares. The beginning of this 3-kilometre trail, which takes about three hours, is located in the village of Molenda, located some 2 kilometres from the Kozienice – Zwoleń highway. Eight stop-

ping places have been marked out on this, the least altered section of the Kozienicka Primeval Forest, with mixed coniferous forests, hornbeam forests, riparian forests, 300-year old oaks, 100-year old maples, a 164-year old pine and its Brzeźniczka breaks and Krępiec watercourse. A walk along this trail, best taken accompanied by the superbly written guide by M. Krzemiński and M. Kurowski, is also a "live" lesson in nature. But above all, it is a lesson about the changes taking place in forest management

and the results of the work of the foresters.

Among other trails, equally interesting are: the "Królewskie Źródła" educational trail (3 km long and about 3 hours to walk), the "Śródborze" educational forest trail (3 km long, 17 stopping places and about 3 hours to walk) and "Miodne" educational nature forest trail, 3 km long and 17 stopping places. All the trails represent natural features of the Kozienice Primeval Forests and describe the work of forester in this area.

- Website for PFC "Puszcza Kozienicka"
<http://www.lkp-puszczakozienic.com.pl>
- Nadleśnictwo Kozienice: ul. Dr. Marii Garszwo 93, 26-940 Pionki,
tel. (048) 612-39-08, fax (048) 612-44-19, e-mail: biuron@nadm-kozienice.com.pl
- Nadleśnictwo Radom, ul. Janiszewska 48, 26-600 Radom,
tel. (048) 345-19-05, fax (048) 345-17-22, e-mail: lasyrad@nadm-radom.com.pl
- Nadleśnictwo Zwoleń, Miodne-Leśniczówka 107/1, 26-700 Zwoleń,
<http://www.nadm-zwolen.com.pl> tel./fax (048)-676-20-21,
e-mail: nadm-zwolen@nadm-zwolen.com.pl
- The State Forests Ecological Education and European Integration Centre:
ul. Płuzańskiego 30, 26-630 Jedlnia Letnisko, tel. (048) 322-16-00, fax (048) 322-17-03



The Janowskie Forests

Location and general statistics

The "Janowskie Forests" PFC was established in the Janów Lubelski Forest District located within the borders of the Lublin Regional Directorate of the State Forests and amount to 31622 hectares. The Janowskie Forests, form part of the Solska Primeval Forest – one of the largest homogeneous forest complexes in Poland, with a total area of 124 thousand hectares.

This PFC is dominated by coniferous habitats (78.3%) with the remaining areas being broadleaved forest habitats with a considerable proportion of mixed and moist broadleaved forests. The forest scenery,

Left:
The Łukawica forest brook

Bottom:
A water storage reservoir in the Jakuby Forest Sub-district, the Janów Lubelski Forest District



The Janowskie Forests



mostly made up of pine woods with small islands of fir and mixed broadleaved forests has an additional diversity in the shape of fish ponds and marshes (with a total area of approximately 1800 hectares) and dune elevations as well as river valleys. The rivers: Biała, Branew, Trzebensch, Bukowa, Łukawica and Dębowiec belonging to the Vistula basin, flow through the Janowskie Forests and together with the ponds and numerous channels create the region's hydrographic network.

The species composition of the stands, whose average age is 67, is dominated by pine (86.4%); fir, alder, ash, birch, oak and spruce can also be found here.

Natural features and protected objects

In 1984, a landscape park was opened in the grounds of the Janowskie Forests. Four years later the park was expanded and currently its area approximates to 40 thousand hectares. More than 4 thousand hectares of the Janów Lubelski Forest District are now embraced by a nature reserve form of protection. These areas are the "Jastkowice", "Szklarnia" and "Łęka" forest flora nature reserves, the "Imielty Ług" and "Kacze Błota" forest peatbog nature reserves and the "Janowskie Forests" history nature reserve, within whose borders a great partisan battle was fought in June 1944.

Some 64 trees in the forests of the Janów Lubelski Forest District are subjected to protection, mostly linden and oak. Protective zones with a total area of approximately 1700 hectares have been established for the permanent habitats of the following birds: white-tailed eagle, black stork and lesser spotted eagle. The Janowskie Forests are one of the few places in Poland, where one may still meet capercaillie. The protective PFC forests occupy 67% of the total Forest District.

Educational features

One of the aims of the "Janowskie Forests" PFC is to cultivate stands of pine using the local seed base (it being an ecotype of the so-called primeval forest pine) as well as to maximise natural regeneration. Other goals include widening the area where fir will grow, restoring wetland habitats and water plant communities to their natural state and improving water relations by water storage measures, using inter alia the existing water reservoirs, mostly ponds. The results of these various efforts by the foresters may be seen as one walks the educational trails.



Top left:
Fish ponds in Momoty

Bottom left:
The "Łasy Janowskie" forest history nature reserve. Porytowe Wzgórze



In the "Szklarnia" nature reserve

The "Szklarnia Nature Reserve" nature trail is approximately 2.5 kilometres long and has 12 stopping places. One may cover this trail – following the green track – in the course of 1.5 hours. On the way, at each of the appointed stopping places equipped with information posts, one may see among other things a forest swamp, a suboceanic coniferous forest, beech, the habitat of the hill ant and finally a stand of silver fir.

The bicycle route from Janów Lubelski to the Szklarnia nature reserve throughout almost its entire length runs through the forest and including the return trip – to the Ecological Education Centre, amounts to 19 kilometres, a trail that with short stops, should not take more than 2.5 hours. The trail starts from in front of the centre at

Obrowa – a suburb of Janów. The first stopping place is at Kruczek – a forest sacred site on the river Trzebensz. Riding along the river valley, one passes spruce and fir undergrowth, followed by a forest swamp. Further on, one sees (as described on the signposts) mixed coniferous forest, water protecting forests, a hunter's shooting platform, artificial regeneration of forest and natural regeneration of fir. The last stopping place is a ranch for "Biłgoraj" horses in the village of Szklarnia, where one may take a rest under an umbrella roof or on a small camping site. The Ecological Education Centre has a bicycle rental.

The Ecological Education Centre in Janów Lubelski, with its permanent exhibition of nature and material culture of the region, as well as forester's work constitutes a superb base for any excursion. The facility has 120 places of overnight accom-

modation including rooms adapted to conduct training courses. Just 300 metres away, the stables offer blitzkas and hypnotherapy and approximately 1.5 kilometres from the centre, the Janowski Bay has a beach, numerous café open in summer and the possibility of some good fishing, as well as the chance to pursue water sports.

Near the Headquarters of the Janów Forest District one can visit the exposition of the rolling-stock of the narrow-gauge railway once used in the Janowskie Forests.

• Nadleśnictwo Janów Lubelski:
ul. Bohaterów Porytowego Wzgórza 35, 23-300 Janów Lubelski,
tel. (015) 872-00-72, 87-20-015,
fax (015) 872-01-85,
e-mail: nadlesnictwo.janow@lp.lublin.pl



The Lubuskie Forests

Location and general statistics

The "Lubuskie Forests" PFC covers the grounds of the Lubusko Forest District which makes up part of the Zielona Góra Regional Directorate of the State Forests and in respect of its area (over 32 thousand hectares) is the one of the largest Forest Districts in Poland. On the Nysa Łużycka river, this PFC stands on the state border with Germany. The Forest District area, lying on two natural forest regions (the Greater Poland – Pomerania and the Silesian), is a typical low-lying terrain, though the difference in height between the lowest point (55.6 metres above sea level) and the high-



Left:
Pines in the Lubusko Forest District

Bottom:
Pine and spruce stands
in "Lubuskie Forests" PFC



The Lubuskie Forests

est (162.8 metres above sea level) amounts to almost 110 metres.

The whole of the "Lubuskie Forests" PFC area is situated in the river-basin of the Oder, the river-basin of the Nysa Łużycka and its tributaries. The hydrographic network is enriched by natural lakes (Zurawno, Płytkie, Głębokie, Niwa and Drutów) abounding in fishes, 46 fish-farming ponds with a total area of 455 hectares and artificial water reservoirs, collecting water for fire-fighting purposes and at the same time helping to increase the water balance of the areas within PFC. The poor sandy soils, formed from post-glacial sands and gravel, mean that the types of forest habitat are dominated by fresh and dry coniferous forests. The absolute ruler among the tree species is pine (88.4%). In the Lubuskie Forests, this species is characterised by its long life and its narrow grain (a physical feature of pine appreciated by the timber industry). Despite the potential vitality of trees of this sort, the dominant stands here are pine, whose average age barely exceeds 55. The reason for this lies in the considerable destruction of the forest during the Second World War and the heavy

logging of trees needed for the rebuilding of the country following the same. The other species of trees that make up the "Lubuskie Forests" PFC include: birch, spruce, oak, alder, beech, ash, larch, hornbeam, linden-tree, aspen and – mostly in the form of biocoenotic admixtures – bird cherry, mountain ash, grey alder and red oak. According to the stand transformation plans in the PFC, the number of broadleaved species increases.

Natural features and protected objects

Of the group of 13 promotional forest complexes so far established, the "Lubuskie Forests" PFC is situated on the decidedly poorest habitats. It has however one of the highest ratios of timber stands. In some of the local communes (for example of Broda) located in its grounds, the forest coverage reaches almost 70%. These extensive, homogeneous forest complexes abounding in fungi, berries and game, attract crowds of tourists from Lower Silesia as well as the municipal agglomeration of central Poland and from abroad. The tourist infrastructure is being developed for the

benefit of this trade (forest parking areas, camping sites on lake Proszów, tourist routes, bicycle trails and agrotourist holdings). Of the 37 protected nature monuments (as of 2002) one of the most interesting is the "Bór Suchy" surface monument – the oldest pine stand in Poland, growing on the very poorest habitat and now over 200 years old. A sensation well worth visiting, is the pine growing near the village of Proszów. This more than 150-year-old tree, with its eight branches grow-

ing from one trunk at a height of approximately one metre from the ground, is aptly called the "Octopus".

On the grounds of the "Lubuskie Forests" Promotional Forest Complex, over 73 hectares are occupied by areas of ecological utility, with stands of rare species of protected plants. The most interesting of these include protected ferns, such as royal fern attaining heights of up to two metres, ostrich fern, hard-fern, club-mosses and sundews. Other protected species of plants listed in the Polish Red Data Book occurring here are *inter alia*: many-stalked spike-rush, brown beak-sedge.

The Lubuska Lands belong to one of the three country's regions with the most numerous occurrences of the white-tailed eagle. Three active nests of this royal bird are observed in the grounds of the "Lubuskie Forests" PFC. Besides rare species of birds, such as for example red kite, hoopoe, nightjar and black stork, one may meet here many other interesting species of animals, including such mammals as: otter, beaver, raccoon dog, badger and insects - the stag-beetle and the Apollo butterfly. Over 70% of the grounds of the "Lubuskie Forests" PFC are located within the borders of areas of protected landscape. In 2001, fragments of the Lubuska Forest District was included in the "Luk Mużakowa" Landscape Park. Two new reserves are planned to be established: "Zurawno" with the forest lake surrounded by the old-growth forest and the "Mierkowskie Wydmy" whose aim is the protection of inland dunes with grey hairgrass.

Educational features

Undertaking the task of instilling ecological awareness in society, the foresters have established a Nature and Forest Education Centre, two educational nature trails and the "Star" by-pass road on the grounds of the "Lubuskie Forests" Promotional Forest Complex with the view to presenting the specifics of the PFC and resultant management objectives

The Nature and Forest Education Centre was established in the village of Jezioro Wysokie on Lake Brodzkie, approximately 12 kilometres from the German border. The main building of this centre, a restored pre-war (1926) wooden forester's house, is located on the edge of an old beech and oak forest that grows on a fragment of a moraine bluff from the Central Polish glaciation, with deep and steep slopes and ravines. There are four thematic exhibition rooms, in which the most essential problems in the work of the forester are attractively presented (forest cultivation, forest protection, nature conservation and eco-



A fire observation tower at the Forest and Nature Education Centre in Jezioro Wysokie



In the search of photographic themes

logical utilisation of the forest), along with nature curiosities. There is also the room presenting the culture-shaping role of forests. The cellars of the building have been turned into a small cafe that is opened on special occasions and able to serve up to 15 customers at a time. Directly adjacent to this one is a second building, containing a lecture hall with an audio-visual equipment, overhead projector, guide-books, large-scale illustrations, library, maps and a collection of films, presenting in short 8 to 20-minute programmes, the natural history of the region and problems connected with forestry work).

The educational elements of the Centre include its Dendrology Garden built from scratch on an area of approximately 2 hectares (with a large collection of pine and exotic species) and an open-sided umbrella roof with camp-fire areas, tables and benches and able to contain up to 50 persons. Since 1999, one may view from this vantage point a panorama of the region, thanks to an observation and fire look-out tower 41 metres tall. One must take the

stairs with their 176 steps in order to reach its scenic platform. Above this platform is a cabin for the observer on fire look-out duty.

The Centre is the starting and finishing point of a nature and forest trail established in several versions (universal, designed for pre-school children and for VIPs) – one of the two trails on the grounds of the "Bory Lubuskie" PFC.

A walk along **the forest educational trail in Jeziora Wysokie** provides the visitor not only a good opportunity to observe nature, but also a profound aesthetic experience, since its route runs over a diverse terrain of end moraine.

These grounds, covered by a natural beech and oak forest with various species of trees and exotic shrubs, is the perfect place to observe many species of trees, shrubs and herbaceous plants. Among other things growing here, there are fruiting edible chestnuts, plane-trees, bald cypresses, regenerating eastern hemlock, Turkey

oaks and Pontic azaleas. At the 15 stopping places of the universal trail, one may independently learn about nature's functions and get to know some of the problems relating to the maintenance and protection of forest resources and forest management.

The "Park Lubuski" forest educational trail is situated in the municipal park in Lubsko and its route runs along the river Lubusza. This trail is 2.5 kilometres long and in the course of 1.5 – 2 hours, one may view wetland forest, riparian forest and an ash carr. The age of one of the highly numerous old monumental oaks growing here is estimated at 350 years. The feeding niches of the local birds, the role of trees uprooted and left to rot, fungi, the importance of a small-size retention and layered stand structure, birds of forest ecosystems, forest utilisation, forest protection against – all these are other subjects one may learn about while wandering down the "Park Lubuski" educational trail.

- **Nadleśnictwo Lubsko: ul. E. Plater 15, 68-300 Lubsko, tel. (068) 372-04-00, fax 372-04-77, e-mail: Finance.Lubsko@rdlp.zgora.pl**
- **Ośrodek Edukacji PrzyrodniczoLeśnej: Jeziora Wysokie 22, 68-343 Brody, tel. (068) 371-26-44**



The Beskid Śląski Forests

Location and general statistics

The "Beskid Śląski Forests" PFC (39.8 thousand hectares) consists of four Forest Districts, subordinate to the Katowice Regional Directorate of State Forests: Bielsko, Ustroń, Węgierska Górka and Wisła. The northern section of this complex is made up of comparatively low hills (300-520 metres above sea level) that give way to the plain of the Vistula valley and the region of a famous reservoir of fresh water for Silesia – the Goczałkowicki Reservoir.

The most interesting part in respect of natural history and scenery is the southern section that is occupied by the Silesian Beskidy mountains – the most western section of the Polish Karpaty Mountains. The slopes of these mountains (even though such peaks as Barania Góra only reach heights little more than 1200 metres above sea level) are very steep and precipitous



left:
A spruce stand in the Wisła Forest District

Bottom:
A beech stand in Beskid Śląski



The Beskid Śląski Forests

and giving the impression of mountains with an Alpine character.

The "Beskid Śląski Forests" PFC mostly lies in the river basin of the Vistula that has its springs in the massif of Barania Góra. A significant role is fulfilled by two dam reservoirs: the Wielka Łąka lake on the Wapienica stream and the Wisła-Czarne at the confluence of the Biała and Czarna Wisłoka. This hydrographic network together with the high rainfalls that in peak areas amount to 1500 mm annually creates excellent conditions for the development of forest ecosystems.

A good example is the local species of common spruce, called "Istebna spruce" – belongs to one of the most precious ecotypes of this species in all Europe. The stands of this species growing in the region of the Vistula and Istebna attain heights of up to 50 metres – a record for the whole of Poland. The chief types of local forest habitat (all 13 habitat types are recorded here) include: mixed broadleaved mountain forest, broadleaved mountain forest and mixed coniferous mountain forest. These stands are composed of: spruce (74.4%), beech (10.4%) as well as pine and oak.

Natural features and protected objects

All the forests in this Promotional Forest Complex have the status of protective forests. Some real pearls of natural history are found among the 12 nature reserves, whose total area is almost 700 hectares. These unique examples include the

"Barania Góra" nature reserve with its sources of the Vistula and 18-hectare "Vistula" nature reserve whose task is the protection of trout. The grounds of the "Beskid Śląski Forests" PFC also include: the Żywiecki Landscape Park, the Beskid Śląski Landscape Park, the Beskid Mały Landscape Park and two nature and landscape complexes: Wapienica Valley and Cygański Las.

There are numerous protected natural features (about 50) and many stands of protected species of plants, such as common polypody, club-mosses, snowdrop, crimson foxglove and smooth carline. Rare species of fauna living here include: ermine, otter, dipper, kingfisher, newts, spotted salamander and from among the circle of animals threatened with extinction – wood grouse, black stork, buzzard, brown bear, lynx and wolf.

Educational features

The "Beskid Śląski Forests" PFC is a real potentate in the field of educational features. On its grounds are two educational centres (in Ustroń-Jaszowiec and Istebna) and eight educational trails and superbly described in guides and folders.

The "Leśnik" Regional Forest Ecological Education Centre was opened in 1998 in Jaszowiec. This facility has a superb display of the natural history of the Beskid Śląski forest ecosystems in twelve show-cases, with inter alia soil profiles, forest communities and fossils. There are also displays presenting articles made of wood, mechanically

treated timber, etc. Adjacent to the Centre, apart from native tree species (beech, oak, birch, spruce), one can find such "exotics" as: eastern hemlock, blue spruce, eastern white pine, laburnum and black pine.

The Centre has at its disposal hotel accommodation and a restaurant serving regional specialities and catering for 100 persons. It also has a conference room – seating 120 and equipped with modern audio-visual equipment.

The Ecological Education Centre in Istebna was established at the Wisła Forest District. Its facilities include a lecture and film projection hall with seating for 100 persons and audio-visual equipment. A permanent display of the flora and fauna of the Beskid forests (for example wolf, wildcat, lynx and capercaillie) is also located here. The cellar area (equipped with colourful display boards and show-cases, picturing various species and development phases of trees, their timber and protected plants and insects) may be used for ecological workshops for young people and environmental science lessons, etc.

The educational nature trail in the Klimczok Group (Bielsko Forest District) presents the specific characteristics of mountainous nature (the layered arrangement of the vegetation and mountainous species) and pro-ecological principles of forest management. It has been laid out alongside tourist tracks and is some 18 kilometres in length, with the time taken to cover it estimated at approximately 8 hours. It is divided into three sections and 12 stopping places, forming a kind of loop that culminates at Klimczok (1117 metres above sea level), but begins and ends at the outlet of the Wapienica valley.

The "Czantoria" educational forest trail (Ustroń Forest District), also leading along tourist routes, begins at the upper chair-lift station at Czantoria in Jaszowiec. It runs along a wide arc through Czantoria (995 metres above sea level.), the stands of trees and vegetation groupings of the "Czantoria" nature reserve to Ustroń. The time taken to cover this 8-kilometre route, with its numerous stopping places is approximately 4 hours.

The "Skalica" educational forest trail (Ustroń Forest District) begins in Ustroń-Jaszowiec, at the "Forester" education centre. This route, amounting to approximately 4 kilometres, is divided into eight thematic sections (through among other things a spruce stand, the slopes of Skalica, to a quarry). It is quite possible to meet with such animals as spotted salamander, newt, buzzard, jay, hooded crow and in the streams: brook minnow, loach, thunder-fish and even river lamprey.



The famous Istebna spruce – a seed stand



The upper course of the Vistula river in the vicinity of Wisła

The "Na Baranią Górę" – Czarna Wisetka valley educational nature trail (Wisła Forest District) begins at the car park at the forester's house of the Czarne Forest Sub-district. Just a few of the 16 stopping places one must visit (in the course of the approximately 3 hour excursion), in order to finally reach the top of Barania Góra mount are: forest cultivation, pheromone insect traps, a seed stand (of 122-year old Istebna spruce), a stand of Douglas fir, Bujokowa Kolnia and Mysia Polana.

The "Na Baranią Góra" – Biała Wisetka valley educational nature trail (Wisła Forest District) begins in the car park at the OSP rescue team's headquarters in Czarne and runs along the with Biała Wisetka valley along a track marked out in blue and ends at the top of the Barania Góra mount. The 10 stopping places passed on this trail include: rock fungi – a group of fabulously shaped rocks on the right slope of the valley, Białka – a place of natural succession processes, Rodła Cascade – the most beautiful complex of natural waterfalls in the Beskid mountains, a primeval forest – an approximately 200-year old stand. The walk to the peak by means of this seven-kilometre route, with a total climb of 650 metres will require approximately 4 hours.

The "Zimnik Valley" educational nature trail (Węgierska Górką Forest District), pre-

senting all the characteristics of mountain nature whether living or inanimate, has been set out at the base of the Skrzyczne massif, along the Zimnik stream. The length of the route is approximately 1.5 kilometres and the time this walk takes should not exceed 2 hours. The trail begins at the forest car park, close by the forester's house of the Ostre Forest Sub-district and has seven stopping places, at which one may see main forest tree species, young generations of forest (artificial and natural regeneration) and the main forest pests. The final, seventh stopping place is a forest nursery.

The "Brenna Bukowa – Karkoszczanka" educational forest trail runs through the forests of the Ustroń Forest District composed of fir, beech and spruce and being a part of the Beskid Śląski Landscape

Park. Boards all along the route inform about tree and animal species that can be found here, forest protection and forest management. The route is 3 km long and two hours to walk (including breaks at the stopping places).

The "Trakt Cesarski" educational forest trail (Węgierska Górką Forest District) was laid out at a short distance from the so-called "Cesarka" a road constructed in the 18th century being the shortest way connecting Cracow with Vienna. The trail is 2 kilometres long and consists of nine stopping places and one vantage point. Taking a two-hour walk along the trail from the small bridge on the Glinna stream down to the Sota river valley, one can learn about forest functions, forest spring waters, richness of forest world with its protected plants.

- Nadleśnictwo Bielsko: ul. Kopytko 13, 43-382 Bielsko Biała, Wapienica, tel. (033) 818-31-69, fax (033) 818-32-02, e-mail: bielsko@lasykatowice.com.pl
- Nadleśnictwo Ustroń: ul. 3 Maja 108, 43-450 Ustroń, tel. (033) 854-35-21, fax (033) 854-34-16, e-mail: ustroń@lasykatowice.com.pl
- Nadleśnictwo Węgierska Górką: ul. Zielona 62, 34-350 Węgierska Górką, tel. (033) 864-12-14, fax (033) 864-14-81, e-mail: wegierska@lasykatowice.com.pl
- Nadleśnictwo Wisła: ul. Czarne 6, 43-460 Wisła, tel. (033) 855-24-26, fax (033) 855-11-60, e-mail: wisla@lasykatowice.com.pl
- Regionalny Leśny Ośrodek Edukacji Ekologicznej "Leśnik": ul. Turystyczna 7, 43-450 Ustroń-Jaszowiec, tel./fax (033) 854-25-72
- Ośrodek Edukacji Ekologicznej w Istebnej: 43-470 Istebna 749 tel. (033) 855-60-14

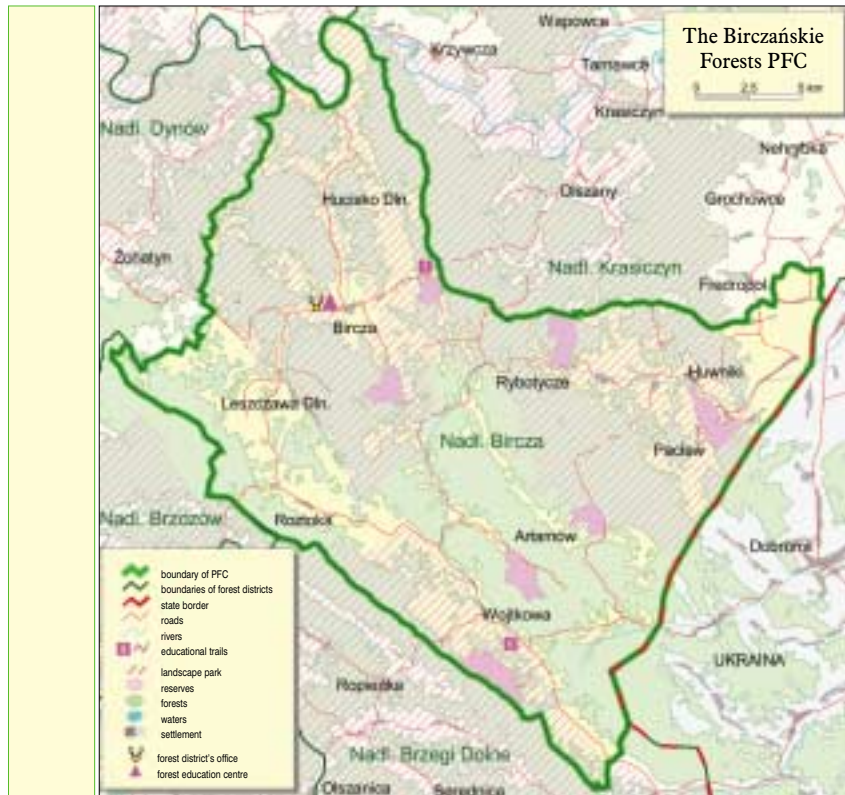


The Birczańskie Forests

Location and general statistics

The "Birczańskie Forests" PFC is situated in the Southeast of Poland, in the Podkarpacka Province. It stretches from an eastern border with Ukraine, to western limits along the river San, with the Przemyskie Foothills. This complex was established as the eleventh of its kind by order of the Director General of State Forests, signed on January 24th 2001. The facility covers an area of 29,500 hectares, lies within the borders of the Krosno Regional Directorate of State Forests and embraces the entire Bircza Forest District. According to the division laid down by Professor J. Kondracki, the border of two of Poland's physical geographic provinces runs through the "Bircza Forests" PFC. Its western section includes the Przemyskie Foothills – a section of the Western Carpathians province, while the eastern section embraces the Sanocko-Turczańskie Mountains – part of the Eastern Carpathians province.

The "Bircza Forests" PFC is situated between the valleys of the San and Wiar rivers, at the point where the Carpathian range takes a turn towards the Southeast. The average height of the two above-mentioned sections of the forest is 400 – 450 metres above sea level. Its wooded hills reach a height of 600 metres and culminate in Suchy Obycz at some 617 metres above sea level. The hills separating the San and



Wiar valleys and their tributaries cut across them diagonally and create a typical geological arrangement called ridge-and-valley mountains. The Carpathian Flysh – the main foundation of these mountain ranges – consists of sandstones with varying degrees of erosion resistance, shales, marls and gravel.

The "Bircza Forests" PFC's forest cover is very dense, amounting to 60%. The only such extensive and homogeneous forest complex in the foothills of the Eastern Carpathians, it includes all types of piedmont forest habitat, with a corresponding

storied arrangement of natural plant communities. Forest cover is composed of upland forest, occupying 50.6%, montane forest – 49.2%, with riparian or marshy meadow forest – a mere 0.2%. The main species occurring in the forest are fir, beech and pine.

The grounds of the "Bircza Forests" PFC are exceptionally charming and attractive in terms of natural history and scenic beauty. According to Stanisław Kryciński, the author of superb guidebooks, the "Przemyskie Foothills" form the borderland of two

Left:
Carpathian beech forest in the Chwaniów mountain range

Bottom:
Beech, beech and fir and fir old-growth forests occupy more than half of the "Birczańskie Forests" PFC



The Birczańskie Forests

nations. This is a land with a stormy history and an uncertain future, a land of deserted hamlets, wild forests and long forgotten Orthodox chapels. It is a second Bieszczady, perhaps without the same alpine pastures but also without the mass tourism, the noisy excursions and souvenir hawkers.

Natural features and protected objects

The Przemyskie Foothills feature two separate levels in respect of their vegetation: up to 500 metres above sea level – a foothill zone, and above this – a lower mountain zone. In the foothill zone, the characteristic vegetation is oak-hornbeam forest growing on fertile soils and above them a piedmont form of Carpathian beech forest. In the Chwaniów, Turnica and Suchy Obycz ranges, constituting a lower mountain zone, the dominant species is Carpathian beech forest. Among the six separate plant communities recognised in the "Bircza Forests" PFC, of particular interest are the osier thickets in the valley of the Wiar river, formed by three willow species called silky osier, West Wales willow and crack-willow.

The present-day floodplains along the larger streams are the habitat of riverside alpine alder carr and, where these streams flow less rapidly, piedmont marshy meadow with ash forest. However, as much as 50% of this terrain is covered by stands of ancient beech, beech and fir or fir, creating a fertile Carpathian beech forest. On the so-called forecrop habitat, in other words on afforested farm lands deserted since World War II, the dominant species is pine and to a lesser degree larch and spruce. But altogether natural and nearly natural habitats occupy 63.8% of the "Bircza Forests" PFC. The stands of the highest degree of naturalness are grouped around the Turnica

stream, among the Kanasin, Suchy Obycz and Turnica mountains and in the highest sections of the Chwaniów belt, as well as in the "Na Opalonym" nature reserve.

Among the plant communities of non-forest areas, deserving special attention are the grasslands and xerothermic thickets growing on the sunniest slopes of the Wiar valley. The palette of natural curiosities of these grasslands is formed by very rare species of plants, such as: thistle *Cirsium decussatum*, Boehmer's timothy, Austrian speedwell and finally large self-heal. Adjacent to these grasslands are habitats dominated by black-thorn. The floristic wealth of these wet and damp meadows has become increasingly impoverished since the liquidation of state farm holdings. Grounds that are no longer being mown are now being dominated by two common grass species: cocksfoot and false oat-grass.

Old fruit orchards, also abandoned since the war, create a specific group of vegetation in this district's landscape. Their remains are especially numerous in the region around Jamna village, on the slopes of the Jamninka valley, where one can still find species of apple, pear, plum and cherry tree that are quite rare today.

Altogether, the flora of the Przemyskie Foothills is composed of 730 species of vascular plants and 217 species of lichens. Due to penetration by elements of alpine, lowland and Pontic flora, the local vegetation enjoys an exceptional degree of variety. The group of alpine species includes some 60 taxons, including 41 mountain forest and two subalpine species. Also present are eastern and western Carpathian species. The first of these tend to dominate and their representatives include: *Aposeris foetida*, European scopolia, intermediate nipplewort and comfrey *Symphytum cordatum*.

The animal kingdom is also very well represented. The mutual penetration of

eastern Carpathian steppe, lower mountain forests, Pontic and alpine elements, with quite considerable tracts of primeval forest has meant that in terms of its fauna, this region belongs to one of the most interesting in Poland. Among others, endemic species include several species of West Carpathian millipede, beetles and snails. The extensive forest tracts are the habitat of common deer, roe deer, wild boar, lynx, wildcat and fox. Lately, bears have also made their home here. The world of birds is represented by golden eagle, lesser-spotted eagle, black stork, hazel grouse and buzzard.

The borders of the present PFC contain several facilities designed to protect such a wealth of fauna and flora. These include two landscape parks, an area of protected landscape and eight nature reserves, with a total area of 1,708 hectares and 30 living nature monuments. Of the six above-mentioned nature reserves, the most interesting is "Krępak" – a section of fir and beech forest with undergrowth characteristic for the piedmont form of Carpathian beech forest. The floristic wealth of this nature reserve is 248 species of vascular plants. Among the 18 of these that are embraced by species protection, one may find such rarities as: white helleborine, spotted orchid, early-purple orchid and violet helleborine – as well as an orchid from the list of threatened species in the Red Data Book. About a thousand skeletons of teleostean fish were recently discovered on the grounds of this nature reserve. These now constitute precious Palaeozoic exhibits.

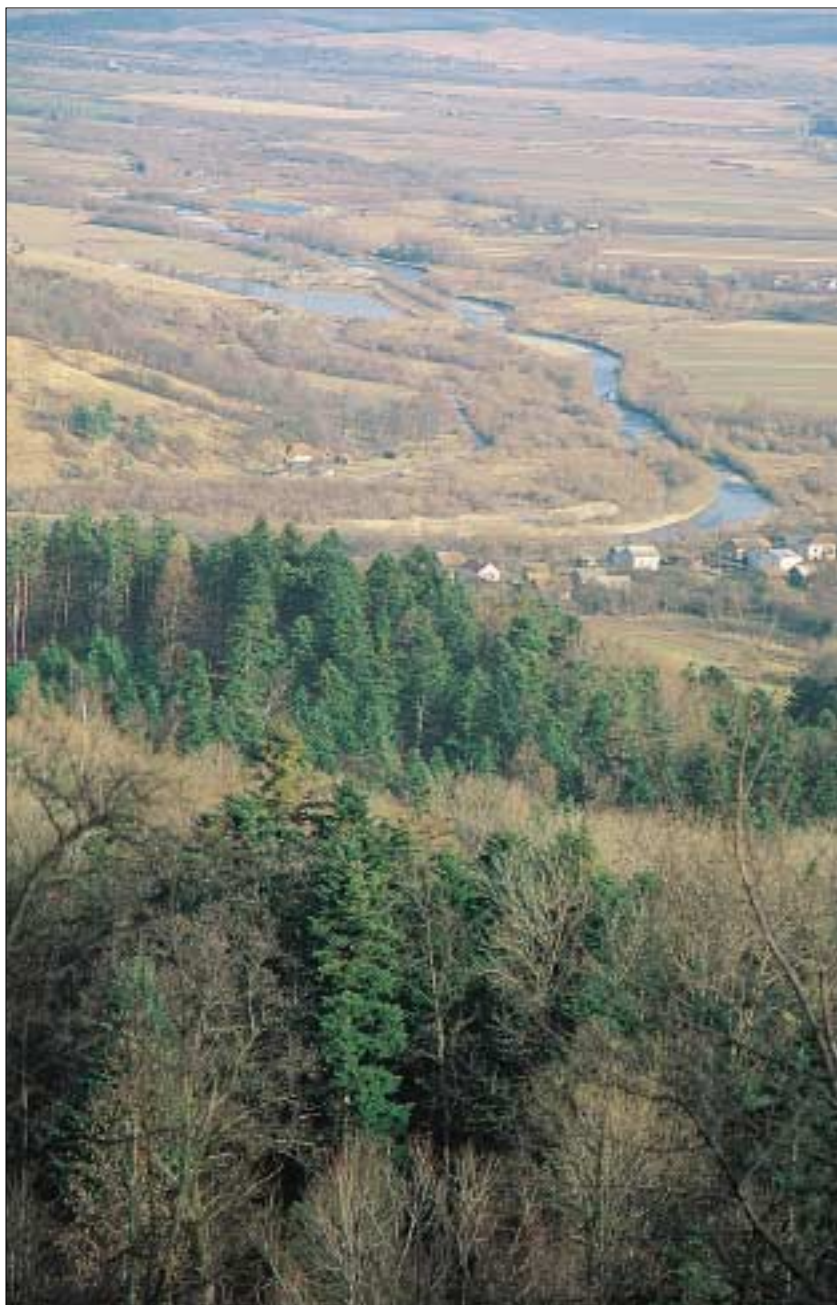
Another nature reserve, the "Turnica", is a precious example of nature, with its Carpathian beech forests as well as fir and beech trees that are well over a hundred years old. The "Na Opalonym" nature reserve embraces alpine and piedmont forests that also include stands of sycamore, beech and fir that are over a hundred years old. Finally, there is the "Reberce" nature reserve, a fragment of fir forest with interesting natural features, where 90% of the stand is composed of fir alone, varied by stretches of boggy alpine alder forest. The two most recent additions are "Kalwaria Paclawska" – a landscape nature reserve with a section embracing the border of the Carpathians and Kalwaria Paclawska's original town-planning arrangement, and secondly, the



Left:
The hotel in Arłamów

Right:
The Wiar valley near the border with Ukraine

The Birczańskie Forests



"Kopystańska" nature reserve that protects a typical Przemyskie Foothills landscape with picturesque rocks, geologic profiles and a castle dating from the early middle ages.

A geological curiosity of the Przemyskie Foothills Landscape Park is the so-called "przemyska sigmoid" – a sharp bend in the border of the Carpathians towards the North. Also of interest are the river gorges in the valleys of the San and Wiar.

Plans for the future of this area include additional living nature monuments, six new nature reserves, also areas of ecologi-

cal utility, as well as so-called documentation stations.

Educational Features

In the "Bircza Forests" PFC that has now been in existence for almost a year, we have already established an education chamber and two educational trails: the "Na Krępaku" nature trail and the dendrology education nature trail in Jureczkowa. The above-mentioned educational chamber has been set up at the headquarters of the Bircza Forest District. It includes a fine

collection of prepared animals (including common deer, wild boar, roe deer and lynx) as well as many bird exhibits. This facility can accommodate about 20 visitors at a time.

The educational nature trail in the Krępak nature reserve is located on the grounds of the Przemyskie Foothills Landscape Park in the Posada Rybotycka Forest Sub-district, quite close to the hamlet of Bircza. A notice board with a map of the nature trail has been erected at the first stopping place, at the beginning of this forest walk. From the second of these stops, one can admire a fir and beech forest, which to a large degree is naturally formed, while from the third stop, one may see the bank of a steep ravine, overgrown with ancient fir trees. This is a perfect observation point for such birds as robin, wren, nuthatch and other species. At the subsequent observation points, the wanderer will meet among other things traces of the existence of wild animals and a place where the forest is slowly dying. In the waters of the stream that flows close to this trail, one can catch glimpses of Carpathian newts or spotted salamanders. Altogether, this trail is 2 kilometres in length and includes 12 stopping places. It takes about 2 hours to cover. Due to the difficult, varying heights of the terrain, it is best to be accompanied by a guide.

The "Trees of the manor park in Jureczkowa" dendrology education nature trail is located at the sources of the river Wiar, south of the Turnica massif. It is about one kilometre in length. At its eight stopping places, the visitor will meet rare specimens of trees, including ancient Douglas-fir, monumental yews, poplars, an woody variety of Turkish filbert and oaks, linden trees and larches of advanced age. Close to the last of these trees, one can observe an active apiary.

Four tourist trails pass through the grounds of the "Bircza Forests" PFC, serving various forms of tourism, qualified as hiking, skiing, cycling and horse riding. The ski lift in the region of Korzeniec makes downhill skiing possible.

The local hostel facilities are not too good. The most attractive places to stay are the hotel in Arłamów and the rest centre in Trójca. Tourists can also take advantage of the hotel in Wojtkowiec, the Pilgrim's House in Kalwaria Paclawska and the youth hostels in Bircza and Korzeniec.

• Nadleśnictwo Bircza: 37-740 Bircza,
tel.: (016) 672-50-04,
fax: (016) 672-53-43,
e-mail: bircza@lasy-krosno.com.pl

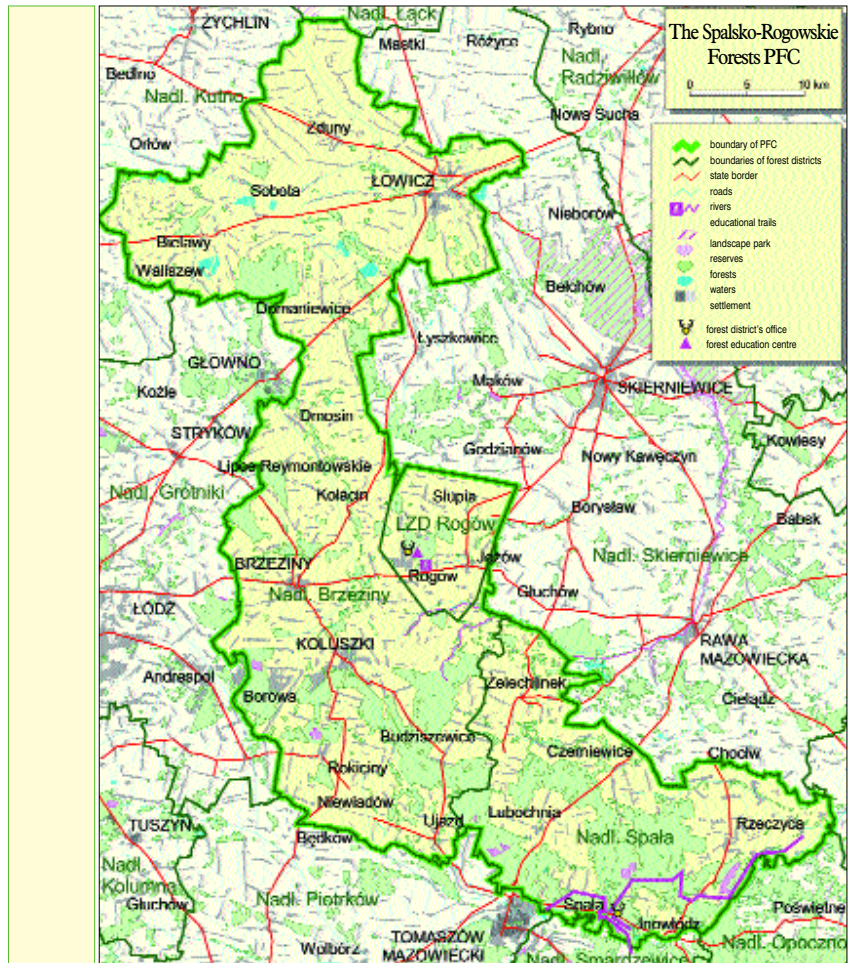


The Spalsko-Rogowskie Forests

Location and general statistics

The "Spalsko-Rogowskie Forests" PFC was established by order of the Director General of State Forests on October 30th 2002, together with the "Mazurskie Forests" PFC; this is the most recent facility of this type in Poland. The forest complex is situated in the Łódź Province and lies within the borders of the Łódź Regional Directorate of State Forests. Its area is made up of two State Forest units: the Brzezina Forest District, the Spala Forest District and the Rogów Forest Experimental Station. The Rogów facility – the property of the Warsaw Agricultural University – consists of the Rogów Forest District, the Nursery Training Centre, the Arboretum and a Centre for Nature-Forest Education.

The whole of the "Spalsko-Rogowskie Forests" PFC lies within the borders of the Natural Forest Region VI, specifically – in the Sieradzko-Opoczyński Subregion. This forest includes the Pilicka Primeval Forest and the former Łódź Primeval Forest. The prevailing species is pine, which reigns over the whole of the forests of the Spala



Left:
Pine forest in the
Brzeziny Forest District

Bottom:
The share of broadleaved species in the
stands of the "Spalsko-Rogowskie Forests" PFC
is insignificant and not greater than 4%



The Spalsko-Rogowskie Forests



The Alpinarium in Rogów

Forest District (89.4%) and the Brzeziny Forest District (77.08%). In the case of the Spała Forest District, other significant species are alder (4%), oak and birch. In the Brzezina Forest District, where the stands are more varied, oak accounts for almost 8%, birch – 6.35%, and beech – 3.46%.

The woods of the Rogów Forest Experimental Station – all that remains of the former Łódź Primeval Forest – occupy an area of approximately 3,600 hectares and are situated in the north-east part of the Łódź Uplands. These woods mainly occupy humped ground moraine with dry gully type valleys, on a mostly flat and wavy terrain. The fertility of the local soils has meant that for a long time these were set aside for farming purposes, which is why the forest cover of the Rogów Forest Experimental Station amounts to just 12.8% and is considerably below the country's average (approximately 28%). Its vegetation is dominated by oak-hornbeam forest and the forest habitat types can be classified as fresh coniferous (40%) and fresh mixed coniferous (43%). The positive changes that have occurred in local forest habitats are in large measure the effect of the forest manage-

ment undertaken over the last half-century, involving discontinuation of such practices as the raking of forest litter, grazing of cattle and the protection of pines in its stands. The limits of naturally occurring ranges of three important forest-forming species, namely: fir, beech and spruce, run through the forests of the Rogów Forest District or its vicinity.

Natural features and protected objects

Two landscape parks and 17 nature reserves are to be found on the territory of the entire "Spalsko-Rogowskie Forests" PFC. Twelve specially set aside wild areas of great natural and scenic value and a considerable diversity of forest habitats are features of the Rogowskie Forests. In these wild areas, one may come across 22 species of protected plants, including 12 that come under the strict protection. Seven sections of the Rogowskie Forests have been conferred the status of partial nature reserve. These nature reserves are the: "Doliska" with its stand of silver fir, the "Zimna Woda", with a 200-year old stand of sessile oak, the "Popień" nature reserve with a 200-year old stand of Scots pine, the "Bukowiec", with a beech stand on the

northern border of the beech natural range, the "Górki" with a stand of twin-flower, the "Kwaśna Buczyna" with a beech stand and the "Rawka", protecting a landscape of an irregular river-valley. A separate feature is the "Dolina Mrogi" natural and landscape complex, established in order to maintain the scenic value of the Mroga river valley, with its numerous picturesque canyons.

A considerable part of the area covered by the Spała Forest District falls within the borders of the Spalski Landscape Park, which was established in 1995 and whose main purpose is to protect the Pilica valley and the Spalskie Forests. Apart from the Pilica valley, other exceptionally precious features are the smaller valleys of the rivers and streams flowing through the forests, for example those of Gaca, Słomianka, Gielzówka, Luboczanka, Cetenka, Anie-linka and Studzianka. The Spalski Landscape Park is also a varied area rich in species of flora, represented by among others round-leafed sundew, ostrich fern, Duch myrthe, common centaury, February daphne, pinks, club-mosses and orchids. There are also abundant species of animals, among them such a bat species as: Bechstein's bat, as well as such bird species as: grey-headed woodpecker, nut-cracker and black grouse. This is also one

The Spalsko-Rogowskie Forests

of the few habitats in Poland of the scarce swallowtail – a beautiful species of butterfly.

The six nature reserves lying within the Spała Forest District occupy almost 3.5% of its area. These are: "Konewka" with its ancient oaks, "Kruszewiec" with fir stands in its northern range, "Małecz" with a species of azalea, "Spała" with its natural fir stand in the Pilica valley, and finally the "Żądłowce" nature reserve – a particularly diverse terrain, with whole belts of woody yews and alders.

The "Wzniesienia Łódzkie" Landscape Park lies within the Brzezina Forest District. This area also features the following nature reserves: "Gałków", "Łaznów", "Parowy Janinowski", "Rawka" (part), "Struga Dobieszkowska" and "Wiączyń". Altogether, these occupy approximately 1.5% of the Brzezina Forest District.

Educational features

The inclusion of the Forest Experimental Station of the Warsaw Agricultural University in the "Spalsko-Rogowskie Forests" PFC has meant that the Station began its operations well endowed with professional educational resources. These consist of: the Centre for Nature-Forest Education in Rogów, together with the Forest and Wood Museum, as well as the Arboretum with its alpine garden located close by. These resources are supplemented by educational nature trails.

The Centre for Nature-Forest Education, established by the Warsaw Agricultural University and State Forests, organises workshops for foresters, teachers and non-governmental ecological organisations, as well as educational sessions for schools, family groups and adults. The Centre is host to numerous conferences; a regular annual event is the "Current problems for society's forest education" Conference. The Centre for Nature-Forest Education is able to offer over 50 different subjects for sessions that are attended by pre-school groups, pupils from elementary schools, grammar schools and secondary schools. These classes are conducted outdoors or in the Forest and Wood Museum. These include for example: research expeditions into the world of ants, observation of the forest floor and shrub layer, searching to answer the question who eats what in the forest, comparing trees portraits (with drawings and measurements) etc. The Centre for Nature-Forest Education Centre has an excellently equipped, air-conditioned lecture and assembly hall (with slide projectors, multimedia and magazines, visual aids, mobile microphones etc.) that can accommodate an audience of 211. The Centre also boasts a hostel with accommo-



The "Spała Nature Reserve" educational trail begins near the Memorial House dedicated to Martyred Polish Foresters and Woodmen in Spała

ation for 160 visitors. The above mentioned Forest and Wood Museum exhibits 287 specimens of birds, 57 mammals, a rich collection (210 species) of pine cones from all over the world, and also a collection of wood samples and wood defects and diseases.

The Arboretum in Rogów – founded in 1925, with an area of 54 hectares – was established from the outset as a scientific and educational facility. It consists of three parts: a dendrology collection, experimental forest areas and an alpine garden. Its collection includes some 2,400 species and examples of trees and shrubs, among them many exhibits from China. The garden has been developed in a natural manner, giving the impression of a forest park rather than a botanical garden. The 135 experimental forest areas boast some 75 species of tree, including 55 conifers. The largest area is occupied by stands of grand fir, Douglas fir, Western red cedar and red oak.

The alpine garden (with altogether about 300 species) consists of a rocky garden

with alpine vegetation from different parts of the world, a garden of protected plants that occur in Poland and a collection of threatened or rare water and swamp plants.

The "Spała Nature Reserve" educational nature trail, laid down on the grounds of the Spalski Landscape Park, begins near the **Memorial House dedicated to Martyred Polish Foresters and Woodmen** in Spała and provides an opportunity to admire the natural scenery of the Pilica Primeval Forest. Special attractions are the picturesque valleys of the forest rivers and streams. The nature trail ends near "Grzybek", a place in which groups of hunters once gathered, with Poland's president Ignacy Mościcki at their head. The length of this trail is about 2 kilometres and the time needed to cover it is 2 hours.

The "Spalskie Forests" educational nature trail provides the walker an opportunity to discover the forest ecosystem as well as the hard work carried out by our foresters.

The "Szlakiem Hubala" is a tourist trail laid out by the PTTK tourist organisation, where one can learn the region's and Poland's history as well as the important role played by forests in our country's history.

- Nadleśnictwo Brzeziny Kaletnik: ul. Główna 3, 95-040 Koluszki, tel.: (044) 714-69-88, fax: (044) 714-15 52, e-mail: brzeziny@lasy.com.pl
- Nadleśnictwo Spała: ul. Gabrysiewicza 2, 97-214 Spała, tel.: (044) 710-13-29, fax: (044) 710-15-70, e-mail: spala@lasy.com.pl
- Leśny Zakład Doświadczalny SGGW w Rogowie: ul. Akademicka 20, 95-063 Rogów, tel.: (046) 874-80-05, fax: (046) 874-90-08, e-mail: lzdrogow@poczta.fm
- Centrum Edukacji Przyrodniczo-Leśnej: ul. Akademicka 20, 95-063 Rogów, tel./fax: (046) 874-83-74, e-mail: cepl@witch.sggw.waw.pl, www.cepl.sggw.waw.pl
- Arboretum: ul. Leśna 1, 95-063 Rogów, tel./fax: (046) 874-81-36, e-mail: arbor@delta.sggw.waw.pl, arbor@wp.pl



The Mazurskie Forests

Location and general statistics

The "Mazurskie Forests" PFC was established by order of the Director General of State Forests on October 30th 2002. It is the largest territory of this type in Poland, occupying an area of 118216 hectares. It lies within the borders of the Warmińsko-Mazurskie Province on the grounds of two regional directorates – the Olsztyn Regional Directorate of State Forest and Białystok Regional Directorate of State Forest and specifically, of five Forest Districts: Strzałowo, Spychowo and Mrągowo (belonging to the Olsztyn RDSF) along with Pisz and Maskulińskie (subordinate to the Białystok RDSF). The "Mazurskie Forests" PFC also includes the grounds of Research Station for Ecological Agriculture and Preservation of Native Breeds of the Polish Academy of Sciences in Popielno. These are: the Kończewo Forest Sub-district, together with its conservation stud farm for Polish ponies and herds living at liberty and the farmlands on the Popielno Peninsula.

The "Mazurskie Forests" PFC is situated in the Mazursko-Podlaski Natural Forest Region II. This part of Mazury is recognised as one of the most picturesque and precious lake districts in Europe, in terms of natural history and scenic beauty. The major part of the complex is formed by the homogeneous stands of the Piska Primeval Forest, with its rich vegetation, containing specimens of Atlantic and boreal flora. The landscape is variegated with a rich network of innumerable lakes, rivers, peat-bogs and swamps

Once, the Piska Forest embraced almost all the Mazurskie Lake Districts and was called the Wielka Knieja (Great Forest) or Puszcza Jańsborska (Jańsborska Primeval Forest). From an inventory of the forest conducted in 1567, it appears that while the dominant trees then were conifers, the percentage of deciduous species was many times greater than today. The forest abounded in game; up to the year 1500, aurochs lived here and it was also a habitat for wild horses until the seventeenth century. The seventeenth century also saw the extinction of the European bison, beaver and bear. Thanks to reintroduction, the forest again has beaver and elk, which before 1945 had also disappeared from the Piska Forest.

In the years 1780 – 1972, pine and spruce stands spread out even further over the Piska Forest, at the cost of broadleaved species.

Left:
The landscape of the "Mazurskie Forests" PFC is variegated with a rich network of innumerable lakes, rivers, peatbogs and swamps

Right:
The Mazurian pine ecotype, also called Prussian pine, with its regular crown and straight knotless stem



The Mazurskie Forests

Pine and spruce stands took control of the forest, with a certain percentage of oak, and on peatbogs – alder stands. The disturbance of the biological equilibrium caused by transformation of stands in favour of commercial coniferous species became the reason for many calamities involving insect pests, as well as the considerable destruction wreaked by damaging winds at the end of the nineteenth and the beginning of the twentieth century. For example, the hurricanes in the years 1833, 1839, 1867 and 1888 decimated primeval stands and the outbreak of pine beauty moth in the years 1923 – 1927 ravaged nearly 8,800 hectares of local forest. The final decades of the twentieth century have also not been kind to the forest. Outbreaks of nun moth attack and the hurricanes in 1981, 1983 and 1999 have made necessary the emergency removal of nearly 1 million cubic metres of timber.

The climate of the Mazurian Lake District features considerable variations in the weather, the result of polar sea air masses meeting continental air masses. For example, in Sychowo (formerly Pupy) ground frosts may occur as late as the 10th of June. Heavy downpours, hail and strong winds are quite common. A real disaster took place on July 4th 2002, when a hurricane lasting a dozen or so minutes denuded approximately 12 thousand hectares of primeval forest.

Today, over 80 percent of its acreage is covered by pinewoods; the composition of the stands is dominated by pine, with an admixture of spruce and broadleaved species. Despite this, pine regenerates very well and there are plans to convert stands by matching the composition of species to the capabilities of the habitat, in other words in favour of deciduous species.

Natural features and protected objects

The charms of nature in the Piska Forest have been immortalised by Melchior Wańkiewicz in his splendid work "Na tropach Smętka". With its quintessence of floristic and phytosociological wealth, the "Mazurskie Forests" PFC spreads out over an area of 1,603 hectares, the forest range of the PAS Research Station in Popielno, stretching between the lakes Beldana, Śniardwa and Warnolta. Alongside a fresh coniferous forest dominated by pine and spruce, there are also mixed coniferous forest and broadleaved forests with a certain percentage of linden, oak, as well as alder forests.

Close by the local lakes, there are plant communities of marshy meadows and many species of rush, moss and sedge peatbogs and high moors, as well as ecotone plant communities and xerothermic grasslands. Among the numerous protected species, the following deserve particular attention: round-leaved sundew, February daphne, martagon lily, running clubmoss and stiff ground-pine, as well as such orchids as greater butterfly-orchid and bird's-nest orchid. A floristic curiosity is the northern twinflower – a relic of the glacial epoch.

The above mentioned forest range is inhabited by free-ranging herds of Polish pony. In Popielno itself, there is a beaver farm that was established in 1958. It was here that the reproduction of the wild population of this species for all of Poland began. Popielno is the only place in Europe where one can observe beavers and learn about them through direct contact. Beaver lodges are today to be discovered throughout the

"Mazurskie Forests" PFC. This complex also abounds in other rare animals. These include: golden eagle, lesser-spotted eagle, osprey, eagle owl, black stork, black grouse, crane, mud turtle, lynx, wolf and elk. One can catch sight of many of these animals in the Mazurian Landscape Park, which constitutes a strictly protected area, mostly on the grounds of the Forest Districts of Strzałowo, Pisz and Maskulińskie. These last two contain six nature reserves, with a total area of 6,300 hectares. In this same area, one may come across 50 nests of golden eagle and lesser-spotted eagle, over 40 beaver lodges, eight areas of ecological utility and finally, 53 living nature monuments.

The Forest Districts of Sychowo, Strzałowo and Mragowo can boast natural wealth and scenery that is no less magnificent. The waterway of the Krutynia river that passes through these Forest Districts is one of the canons of any Mazurian boating expedition. Bewitched by the nature found in these forests, it was Melchior Wańkiewicz who nowhere other than in Pupy (such as Sychowo's name until 1960) began his tramp through the land of the Prussians, a trip he later beautifully described in the above-mentioned book "Na tropach Smętka". Krutynia, celebrated today by the M. Wańkiewicz International Canoeing Rally, flows through the Strzałowo Forest District, a land of at least 68 lakes that can boast surface areas of over a hectare. The largest of these – Jezioro Mokre – covers some 840 hectares, while the deepest – Babant Wielki – has

On July 4th 2002, a hurricane denuded approximately 12 thousand hectares of the Piska Primeval Forest



The Mazurskie Forests

a depth of 67 metres. It is here that the famous Babancka Struga flows, which thanks to its considerable falls (over a 5.5 kilometre stretch, the difference in its level is as much as 9 metres) reminds one of rapid alpine torrents.

Over 3,500 hectares (20%) of the Strzałowo Forest District are embraced by the strict wildlife protection. Its six nature reserves are: "Pierwos", "Strzałowo", "Królewska Sosna", "Zakręt" and "Czaplisko Ławny Lasek". One can also see here 123 monument trees, for example the powerful oak in the Kołoin Forestry Sub-district (29 metres high, with a circumference of 610 cm) and a handsome linden tree (23 metres high, with a circumference of 700 cm) in the Rańsk Forestry Sub-district. Local rare plants include leather leaf (a bush that occurs in only seven habitats in the whole of Poland), Siberian iris and the creeping lady's-tresses – a rare orchid growing in dark coniferous woods.

The pride of the local foresters is the precious Mazurian pine ecotype, also called Prussian pine, with its regular crown and straight knotless stem. The selected plus trees attain a height of 38 metres and a circumference of 69 cm. In order to maintain the Mazurian pine on the grounds of the Strzałowo Forest District, four selected seed stands on 126 hectares have been set aside for the purpose of intensive seed production.

Educational Features

The grounds of the Research Station in Popielno include a Regional Ecological Education Centre of the Polish Academy of Sciences and two educational nature trails.

The Regional Ecological Education Centre, established in 1998, with its rich educational resources, takes advantage of its close vicinity to: the Piska Forest, Łuknajno lake – UNESCO's Biosphere Reserve, the Polish pony stud farm and the breeding farm for beaver and deer, as well as a museum room with the Popielno Research Station's collection. The Regional Ecological Education Centre's activities are addressed to children of all ages. A separate program has been specially developed for each age group. For example, in autumn the subject matter for pre-school children is: "How the jay prepares to fly overseas" which is about how different animals prepare for the winter. For grammar-school pupils, there is a bicycle trip to the Łuknajno Biosphere Reserve, where mute swans may be observed. The subject for secondary-school pupils is: "Reproduction of threatened species – restitution, introduction and reintroduction". The Centre in Popielno can accommodate and cater for 50 visitors and has a lecture room and clubroom.

A nature trail (unnamed) some 10 kilometres long, with 15 special observation points, begins and ends on Lake Śniardwy in Popielno. Its purpose is to introduce visitors to the vegetation growing in the Popielno Forest



Popielno is the only place in Europe where one can observe beavers and learn about them through direct contact

and around the adjoining lakes and also, some elements of forest management.

The "Smolak" botanical nature trail, some 4 kilometres long, has four special observation points. It consists of two overgrown dystrophic lakes situated within the borders of the Popielno forest – Smolak Duży i Smolak Mały (Large Smolak and Little Smolak), a fragment of boggy forest and the Kurze Bagno peatbog – all that remains of a former pond. This nature trail provides the visitor the opportunity to acquaint himself with the different stages of succession in various types of vegetation.

The Forest Ecological Education Centre in Spychów has been set up in a former farm building on the grounds of the Spychowo Forest District's headquarters. Here one can view a fine collection of animals; the nearly one hundred exhibits include beaver, otter and swan. The Centre's lecture room can seat an audience of about 50 and is equipped with audio-visual aids. The 4 kilo-

metre long educational nature trail starts from this point. Along the way, we pass two lakes and a peatbog, which one can examine from special footbridges, as well as typical features of a hunting ground – a hunter's vantage point built on stilts, a feeding rack and a salt lick for deer.

The nature trail in the Strzałowo Forest District, laid out in a figure eight shape, features two trail versions: one 3.1 kilometres long and a longer version of 5.2 kilometres, both of which begin on the Piecki – Mikołajki road, on the edge of the "Strzałowo" nature reserve. From the trail's stopping places (of which there are 11), one can observe among other things the way newly planted trees are protected, a group of oaks between 250 and 350 years old and the regeneration of sycamore. The trail ends on a footbridge at the Majcz Wielki Lake. Looking into its depths (the water purity is class A), one can clearly see under-water meadows of stonewort.

The Pierwslawek forester's house in the Strzałowo Forest District features a **Memorial Room** dedicated to the German writer Ernst Wiechert, the author of such books as "The Jerominów Children" and "Forest of the dead".

- **Nadleśnictwo Strzałowo:** Strzałowo 2, 11-710 Piecki, tel./fax: (089) 742-11-65, e-mail: strzalowo@olsztyn.rdlp.gov.pl
- **Nadleśnictwo Spychowo:** ul Mazurska 3, 12-150 Spychowo, tel.: (089) 622-50-82, (089) 622-50-83, e-mail: spychowo@olsztyn.rdlp.gov.pl
- **Nadleśnictwo Maskulińskie:** ul. Rybacka 1, 12-220 Ruciane-Nida, tel.: (087) 423-11-35, fax: (087) 423-10-15, e-mail: maskulinskie@bialystok.las.gov.pl
- **Nadleśnictwo Pisz:** ul. Gdańska 24, 12-200 Pisz, tel.: (087) 423-29-05, fax: (087) 423-21-00
- **Stacja Badawcza PAN w Popielnie:** Popielno, 12-222 Wejsuny, tel.: (087) 423-15-19, tel./fax: (087) 423 16 17, e-mail: sbpan@wp.pl

PROMOTIONAL FOREST COMPLEX

Pocket dictionary of some of the terminology used

Alder carr – a type of forest habitat on boggy grounds and lowmoors, with stands of ash, elm and alder.

Arboretum – a separate area with a collection of arborescent plants of various species and origins.

Area of protected landscape – a spatially separated unit embraced by protection due to the distinctive scenic qualities of the terrain with its various types of ecosystem.

Areas of ecological utility – the remains of ecosystems important for maintaining unique gene resources and types of environment, such as: natural water reservoirs, small natural ponds in fields or deep within the forest, clumps of trees and shrubs, swamps, peatbogs, dunes, old river beds, rocky outcrops etc.

Biocenosis – a group (population) of plants and animals inhabiting a given environment, connected by their mutual dependence.

Biodiversity (biological diversity) – the variety of forms of life on Earth or in a given area.

Clear felling – involves the simultaneous cutting of all trees in a felling area and usually the artificial regeneration of the stand of trees.

Clear-cut area – the area left after a simultaneous and complete felling of a stand of trees.

Coniferous forests – a group of types of forests in which stands of pine or spruce dominate, with a poor herbaceous layer but a large proportion of mosses and lichens.

Dendrology – the science of trees and shrubs.

Ecology – the science of mutual dependence between organisms or groups of organisms and the environment, in which they live.

Ecosystem (biogeocenosis) – a system formed by all organisms populating a given area

Ecotone – a temporary zone between adjoining ecosystems.

Ecotype – an inherited ecological form (race) of a species, conditioned by the specific (local) properties of the environment.

Exotic – a plant cultivated outside its natural range.

Forest district – a basic, independent organisational unit of the State Forests fulfilling economic and administrative functions in forest and non-forest management; it consists of 2-3 economic units and several to a dozen or so forest sub-districts (administrative units).

Forest utilities – forest produce and various other material goods to be obtained from the forest and used to satisfy man's needs.

Group felling – involves establishment of irregularly arranged regeneration centres (nests) that are successively extended.

Herbaceous layer (forest floor vegetation) – the lowest layer of plants in the forest, beneath the layer of shrubs, mostly consisting of herbaceous plants, mosses, lichens and fungi.

Hornbeam forest – forest complexes with many layers and species (mostly oak and hornbeam) on fertile soils; originally – the prevailing component of lowland vegetation in Poland.

Landscape park – an area protected in view of its natural, aesthetic, tourist and cultural features, whose purpose is to maintain, popularise and disseminate these qualities under conditions of rational management.

Monoculture – a even-aged single-species stand, usually of artificial origin. In Poland – usually pine or spruce stands.

National park – a distinctive naturally formed area, outstanding for its special natural and scenic qualities, protected for scientific, social, cultural and educational purposes, with an area of not less than 1,000 hectares.

Nature monument – a single living or inanimate feature of nature (also concentrations of the same) with a special scientific, cultural, historic or scenic value, with distinctive features.

Nature reserve – an area embracing ecosystems, specific species of plants and animals and elements of inanimate nature, maintained in their natural or only slightly changed state and having some essential scientific, natural, cultural or scenic value.

Old-growth – a stand of trees in its period of old age that has reached the natural end of its life (usually 100 – 300 years), losing the ability to produce timber mass or reproduce.

Outbreak – a mass reproduction of a specific species of animals, mostly insects.

Pheromones – volatile chemical substances, largely secretions of glands in insects, serving as a means of communication between individuals of the same species as a distress signal, sexual identification or the scent trail to sources of food or their nests.

Plantation – a large area occupied by many years' cultivation of one plant species.

Protective forests – forests whose major function is to protect soils, water supplies or other components of the environment, also forest complexes located in the protective zones of cities, sanatorium and health resorts.

Reintroduction – the introduction in a specified area of a species that once occurred there but died out.

Riparian forest – a type of forest habitat on the periodically flooded terraces of large rivers, very fertile, with stands of oak, ash and poplar.

Selected seed stand – a stand of trees with especially high quality properties among the individual trees, protected and developed for the purpose of intensive seed production.

Shooting platform – a hunter's position, placed several metres above the ground, usually constructed of poles, that facilitates observing and ambushing game.

Peeling (tapping) – the peeling of bark of trees by game (ungulates) in order to obtain food.

Understorey – trees or shrubs that remain constantly in the lower layer of a stand, fulfilling a cultivation role and with little hope of growing into higher layers.

Undergrowth the young generation of trees of different origin with a height of over 50 cm, growing under the shelter of a stand.

Moist broadleaved forest – a very fertile type of forest habitat, dominated by oak, ash or alder, with rich lower layers.

„The goals of establishing promotional forest complexes relate to the following issues:

- 1) the comprehensive identification of the state of forest biocoenoses and the ongoing changes;**
- 2) the permanent preservation or reconstruction of valuable features using the methods of rational forestry management conducted on ecological basis;**
- 3) integration of of the goals of sustainable forestry management and nature conservation;**
- 4) promotion of multifunctional and sustainable forestry management with financial support from both domestic and foreign sources;**
- 5) research allowing conclusions to be drawn concerning the opportunities and conditions for ecodevelopment to be popularised throughout the State Forests;**
- 6) organisation of training courses for the Forest Service, as well as ecological education for the whole society“.**

**A fragment of the Decree No. 30 issued by
the Director General of the State Forests
on 19 December, 1994
concerning promotional forest complexes**

