

## World Heritage Sites

### Protected Areas and World Heritage



## PRIMEVAL BEECH FORESTS OF THE CARPATHIANS AND THE ANCIENT BEECH FORESTS OF GERMANY SLOVAKIA, UKRAINE & GERMANY

*The Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany are a serial property comprising fifteen components. They represent an outstanding example of undisturbed, complex temperate forests and exhibit the most complete and comprehensive ecological patterns and processes of pure stands of European beech across a variety of environmental conditions. They contain an invaluable genetic reservoir of beech and many species associated and dependent on these forest habitats.*

### COUNTRIES

Slovakia, Ukraine and Germany

### NAME

Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany

### NATURAL WORLD HERITAGE TRANSNATIONAL SERIAL SITE

2007: Inscribed on the World Heritage List under Natural Criterion (ix)

2011: Extended to include five forests in Germany under the same Criterion.

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee issued the following Statement of Outstanding Universal Value at the time of inscription:

#### Brief Synthesis

The Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany are a serial property comprising fifteen components. They represent an outstanding example of undisturbed, complex temperate forests and exhibit the most complete and comprehensive ecological patterns and processes of pure stands of European beech across a variety of environmental conditions. They contain an invaluable genetic reservoir of beech and many species associated and dependent on these forest habitats.

**Criterion (ix):** The Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany are indispensable to understanding the history and evolution of the genus *Fagus*, which, given its wide distribution in the Northern Hemisphere and its ecological importance, is globally significant. These undisturbed, complex temperate forests exhibit the most complete and comprehensive ecological patterns and processes of pure stands of European beech across a variety of environmental conditions and represent all altitudinal zones from seashore up to the forest line in the mountains. Beech is one of the most important elements of forests in the Temperate Broad-leaf Forest Biome and represents an outstanding example of the re-colonisation and development of terrestrial ecosystems and communities after the last ice age, a process which is still ongoing. They represent key aspects of processes essential for the long term conservation of natural beech forests and illustrate how one single tree species came to absolute dominance across a variety of environmental parameters.

#### Integrity

The individual components of this serial property are of sufficient size to maintain the natural processes necessary for the long-term ecological viability of the property's habitats and ecosystems. Buffer zones including surrounding protected areas (nature parks, biosphere reserves) will be managed to protect the property and enhance integrity.

### Protection and Management Requirements

Long-term protection and management is ensured through national legal protection as national parks or core areas of a biosphere reserve. Effective implementation of the integrated management plan and the trilateral integrated management system is required to guide the planning and management of this serial property. Key management issues include forest fire control and conservation of monumental old trees, conservation and management of mountain meadows, river corridors and freshwater ecosystems, tourism management, research and monitoring. Cooperative management agreements with local groups and tourism agencies can enhance the achievement of management goals and ensure local community engagement in the component parts.

### INTERNATIONAL DESIGNATIONS

1990: Schorfheide-Chorin designated a Biosphere Reserve under the UNESCO Man and Biosphere Programme (129,161 ha).

1998: The East Carpathians designated a Transboundary Biosphere Reserve under the UNESCO Man and Biosphere Programme (213,211 ha; 113,846 ha in Poland; 58,587 ha in Ukraine; 40,778 ha in Slovakia).

### IUCN MANAGEMENT CATEGORIES

#### Slovakia/Ukraine:

Karpatskiy Biosphere Reserve	Ia Strict Nature Reserve
Poloniny National Park	II National Park
Stuzhytsia-Uzhok Nat. Nature Reserve	V Habitat/Species Management Area

#### Germany:

Hainich National Park	II National Park
Kellerwald-Edersee National Park	II National Park
Grumsin in Schorfheide-Chorin Biosphere Res.	unset
Jasmund National Park	II National Park; V Habitat/Species Management Area
Serrahn in Müritz National Park	II National Park

### BIOGEOGRAPHICAL PROVINCES

Middle European Forest (2.11.5); Atlantic (2.9.5)

### GEOGRAPHICAL LOCATION

**Slovakia/Ukraine:** The ten sites are in the eastern Carpathian mountains, five in eastern Slovakia and south-western Ukraine near the Polish border, and five in southwest Ukraine near where the mountains pass into Romania. They lie between 47°56'12"N to 49°05'10"N and 22°11'23"E to 24°23'35"E.

**Germany:** The five forests of the extended site are scattered from Thuringia and Hesse in central Germany to Brandenburg and Mecklenburg-West Pomerania in northeastern Germany between 51°04'43"N to 54°32'53"N and 8°58'25"E to 13°53'44"E.

### DATES AND HISTORY OF ESTABLISHMENT

#### Slovakia/Ukraine:

- 1908: First Ukrainian forest Natural Reserve established in Stuzhytsia;
- 1920s: Several Ukrainian beech forests became Protected Areas;
- 1968: The Carpathian Biosphere Reserve created by Soviet Council decree 568;
- 1977: The Eastern Carpathian National Park established in Slovakia
- 1980: Karpatskiy National Park (50,303 ha) established over the area of the four easternmost sites;
- 1992: Carpathian (Karpatskiy) Biosphere Reserve established by Law 2456-XII, over the same area;
- 1993: Eastern Carpathian UNESCO-MAB Biosphere Reserve established in Slovakia and Poland;
- 1998: Ukraine joined the MAB Reserve;
- 1997: Poloniny National Park established in Slovakia by Act 258, covering 3 of the 4 Slovakian sites;
- 1998: The Council of Europe Diploma A awarded to the Ukrainian Carpathian Biosphere Reserve;

2002: Vihorlat Protected Landscape Area established in Slovakia.

#### **Germany:**

1998: Hainich National Park established (7,513 ha);

1990: The Schorfheide-Chorin-Biosphere Reserve (121,961 ha, surrounding Grumsin), Jasmund National Park (3,003 ha), and Müritz National Park (32,200 ha, surrounding Serrahn) all established following national reunification;

2004: Kellerwald-Edersee National Park established (5,724 ha).

#### **AREAS**

The inscribed World Heritage property is 33,670.1 ha (29,278.0 ha in Slovakia/Ukraine and 4,391.2 ha in Germany). The designated buffer zones cover 62,402.3 ha (48,692.7 ha in Slovakia/Ukraine and 13,709.6 ha in Germany).

<b>Site</b>	<b>Country</b>	<b>Property (ha)</b>	<b>Buffer Zone (ha)</b>
Stužica-Bukovské Vrchy	Slovakia	2,950.0	11,300.0
Vihorlat	Slovakia	2,578.0	2,413.0
Stuzhystsia-Ushok	Slovakia	2,532.0	3,615.0
Havešová	Slovakia	171.3	63.99
Rožok	Slovakia	67.1	41.4
Uholka-Shyrokyi Luh	Ukraine	11,860.0	3,301.0
Svydovets	Ukraine	3,030.5	5,639.5
Chornohora	Ukraine	2,476.8	12,925.0
Maramarosh	Ukraine	2,243.6	6,230.4
Kuziy-Trybushany	Ukraine	369.6	3,163.4
Hainich	Germany	1,573.4	4,085.4
Kellerwald	Germany	1,467.1	4,271.4
Grumsin	Germany	590.1	274.3
Jasmund	Germany	492.5	2,510.5
Serrahn	Germany	268.1	2,568.0
<b>TOTAL</b>		<b>33,670.1</b>	<b>62,402.3</b>

#### **LAND TENURE**

**Slovakia/Ukraine:** State-owned, managed by the Carpathian Biosphere Reserve Administration with the Slovakian State Nature Conservancy and the Ukrainian Uzhanski National Nature Park under the Slovakian Ministry of the Environment and the Ukrainian Ministry of Environmental Protection.

**Germany:** The National Parks are owned and managed by the Federal States of Thuringia, Hesse and Mecklenburg-Western Pomerania under the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and the Federal Agency for Nature Conservation. Kellerwald is 0.07 is also in commune and private ownership. However, the Schorfheide-Chorin Biosphere Reserve in Brandenburg is only 20% state owned. 15% is privately owned, 1% community owned and 64% owned by the Biosphere Reserve support charity, Kulturlandschaft Uckermarcke.V.

#### **ALTITUDE**

**Slovakia/Ukraine:** 210m to -1,700m (Maramorosh massif)

**Germany:** sea level to 626m (Trädelkopf, Kellerwald)

#### **PHYSICAL FEATURES**

**Slovakia/Ukraine:** The East Carpathian mountains extend 1000 km through Poland, Slovakia, Ukraine, and Romania. In Slovakia they are called the Bukovske Vrchy (Beech Hills). They form a rolling ridge and valley landscape underlain by upper Cretaceous and early Tertiary sandstones and claystones, called the Carpathian flysch, and of anticlinal limestone ridges and synclinal valleys in the more easily weathered schists. The main ridge on the Polish border is on the Continental divide, and continues

through Ukraine; from it, lower spurs run out to the foothills. The three borders meet at Mt. Kremenets (1,221m). Maramorosh has granitic bedrock and Virhorlat is an andesitic volcanic massif. The dominant soils are acidic and rocky brown forest soils with alluvium and some peat in the valleys, podzolic lithosols on high mountains and gley on the slopes. The many headwater streams flow south towards the Danube.

**Germany:** The five forest sites in Germany illustrate a range of beech forest ecosystems from chalk sea cliffs and lowlands to low hills and acidic mountainsides. Jasmund on Rügen Island in the Baltic is a largely flat landscape over Upper Cretaceous chalk covered by sands and bouldery marl soils forested to the sea edge. Serrahn is an undulating glaciated lowland with lakes, mires and bogs lying in boulder clays and acidic sands. Grumsin is part of a wide lowland landscape of moraines covered by fens, mires and lakes, bouldery clays and leached brown soils. Hainich, between 300-500m is an incised hilly plateau of Mesozoic marine limestone (muschelkalk) with a detrital clay and rendzina soil cover. Kellerwald rises from 200 to 626m as a part of a dissected mountain massif formed of Palaeozoic silicious slates, shale and greywacke with shallow, acidic, nutrient-poor soils except in talus slopes and valleys. It is underlain by 300-400 million year old Lower Carboniferous marine sediments.

## CLIMATE

The reserves in Slovakia and Ukraine have a mountain climate with a wide diurnal temperature range. Mean annual air temperatures decrease with altitude from 9.5°C at 500m to 5°C at 1,000m. The mean temperatures in July are 15.3°-17.4°C, and in January, -4.0° to -7.4°C). The lowest recorded temperature is -40°C and the highest is 31°C. Annual rainfall ranges from 800mm at low elevations to 1,250mm in the high mountains, falling mostly in summer, July being the wettest month. Snow cover lasts between 90-140 days a year with, varying with altitude, depths of 40-80cm to 150cm. In Germany the five sites lie between subcontinental and Atlantic influences, and their climates are similar with relatively slight variations. They receive an annual rainfall of between 550mm and 860mm, peaking in summer, with mean annual temperatures between 6°C and 8.3°C, which are slightly cooler and more oceanic on the coast. The prevailing winds are west to southwesterly and storms occur in late winter.

## VEGETATION

**Slovakia/Ukraine:** Ancient undisturbed *Fagus sylvatica* beech forests, monodominant, ecologically stable and intact, cover extensive areas of this nomination, including the largest virgin beech forest in Europe on the Uholka-Shyrokyi Luh massif in Ukraine. They are relics of mesotrophic forests that used to cover two fifths of temperate Europe. The area is exceptional in the extent, integrity and age of its forests of beech, but these apart, the flora is largely representative of its type. Past the foothill oak groves (200-590m), there are five main vegetation types: beech forest (500-1,200m), beech-fir forest (1,100-1,200m), pine-alder alpine dwarf woodland unique to the region, subalpine and alpine meadows, and upland rocky-lichen landscapes.

60 plant communities, over 1,100 vascular plants, at least 741 species of fungi (481 in the beech forests), 444 mosses and at least 436 lichens have been recorded in the ten sites, with 14 species endemic to the Carpathians. Oak-beech forests are found on the lowest and warmest sites: dominated by common and sessile oaks *Quercus robur*, *Q. petraea* and hornbeam *Carpinus betulus*, but including Norway and field maples *Acer platanoides*, *A. campestre* and the lindens *Tilia platyphylloides* and *T. cordata*. The herb layer is dominated by hairy sedge *Carex pilosa*. Low and middle elevation meadows and pastures are quite species rich. On sites with more humus and on talus, there are Scotch elm *Ulmus montana*, ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus*, and limes. Maple-beech forests grow between 1,000-1,190m. Silver fir *Abies alba* occurs at higher and wetter levels and dwarf pine *Pinus mugo* and green alder *Alnus viridis* above them. Near the summits, harsh conditions limit tree growth. The banks of brooks are lined by the willows *Salix aurita* and *S. silesiaca*.

Deforested sites at lower and middle levels are usually overgrown by scrub associations. Rare varieties and forms of birch *Betula* occur. There is a great range of non-forest communities: soaks, mires, meadows, pastures and the timberline grasslands (*poloninas*), a species-rich and local mountain vegetation type, created mostly by grazing cattle on the mountain ridges and dominated by *Prata subalpina*, *Nardus stricta*, *Deschampsia caespitosa* and *Festuca rubra*. Since grazing stopped their species-richness has decreased and smallreed *Calamagrostis arundinacea* has expanded, creating a future management problem.

**Germany:** Beech forests of 11 species grow in temperate North America, Europe and East Asia, but the copper beech *Fagus sylvatica* grows only in Europe and western Asia. It spread during the last 15,000 years from glacial refugia in the Balkans to become the dominant climax forest over two-fifths of the continent and is still extending its range on the margins. Its main advantage in Germany over the pre-existing Oak-Linden mixed forest is its ability to outshade competition and thrive on shallow soils, though winter temperatures lower than -30°C are a major limiting factor. However its heartland in the central lowlands is easily exploited: 7,500 km<sup>2</sup> is scattered around Europe, but the 2,500 sq.km. in Germany is all that remains of a far larger forest. This is oldest, most extensive and most biodiverse in the Carpathians. In Germany it forms less than 5% of the total forested area and contains only small (5-50 ha) primeval segments which have never been subject to exploitation. However, these remain the best conserved, most natural and most beech-dominated primary forests in the country. They occur at heights from sea level to over 600m on a variety of soils, calcareous to acidic, each with a characteristic herb layer depending on the type of soil. They are rich with species which indicate old-growth or undisturbed deciduous forests. Commonly accompanying them are sessile oak *Quercus petraea* and the herb wood melick *Melica uniflora* and there is a great number of fungi owing to the abundance of dead wood. There is also a considerable range of non-forest communities.

Jasmund forest growing on chalky soils is 80% beech-dominated and has a rich ground cover of geophytes in spring. The Serrahn forest grows in wet acidic soils above a high watertable and is intermixed with pine, alder and birch carr. It has been neglected for 50 years and has 154 species of fungus. Grumsin is part of the largest old beech forest in the country. Though it was much utilised in the past, 24 of its 349 higher plants are on the national Red List. In Hainich, growing on muschelkalk, it is part of the country's largest mixed forest and exists in various successional stages with 1,167 species of plants, 146 European forest species, 812 ferns, 221 mosses and 134 lichens. The steep acidic mountainside forests of Kellerwald have never been disturbed and small areas are over 160 years old.

## FAUNA

**Slovakia/Ukraine:** Although its wildlife is distinct from that of surrounding mountains, the fauna, like the flora, is representative rather than exceptional, although the undisturbed forest is very good habitat for the rich invertebrate life. About 1,500 animal species are recorded, 292 vertebrate and more than 1,500 invertebrate species, 950 being insects. Between the ten sites, 73 mammal, 101 bird, 8 reptile, 10 amphibian, at least 74 mollusc, 20 fish and 165 butterfly species are reported. They include a great many saproxilic wood- and tree-dwelling and some cave-dwelling species, dependant on the forests' characteristically rapid decomposition of coarse woody debris (especially on the volcanic andosols of Vihorlat). It is one of the most extensive European sanctuaries for large forest animals, many of which immigrated from the northeast after World War II. These include brown bear *Ursus arctos*, bison *Bison bonasus* (introduced via Poland), wolf *Canis lupus*, Eurasian lynx *Lynx lynx*, wildcat *Felis silvestris*, Eurasian wild boar *Sus scrofa attila*, elk *Alces alces*, red deer *Cervus elephus* and roe deer *Capreolus capreolus*. There is a rich fauna of common small mammals and 20 species of bats, many being dendrophilous, including the rare Bechstein's bat *Myotis bechsteini*. There is a remarkable diversity of centipedes, isopods and millipedes in beech-fir woods and a multitude of beetles in broad-leaved forest: 572 species are reported including the rosalia longhorn *Rosalia alpina* (VU). The only characteristic East Carpathian species is the slug *Trichia bielzi*, found in luxuriant valley groves. The reserve protects the gene pool of animals such as the East Carpathian pony *Equus caballus huculensis*, which is a local attraction. 192 bird species are recorded. Typical of the region are black stork *Ciconia nigra*, golden and lesser spotted eagles *Aquila chrysaetos* and *A. pomarina*, corncrake *Crex crex*, eight species of woodpeckers, hoopoe *Upupa epops* and western capercaillie *Tetrao urogallu*.

**Germany:** These forests are home to 20% of the terrestrial fauna of central Europe with very few larger mammals but eight species of bat, including the near-threatened barbastelle *Barbastella barbastellus*, many forest birds including six species of woodpecker, and a very abundant beetle fauna, both related to the abundant decaying wood with its wide array of ecological niches: 19 primeval forest relict species have been recorded from the five sites. Coastal Jasmund has the greatest number of birds: the 86 breeding species include 30 beech forest species, oriole *Oriolus oriolus* and cliff-breeders such as peregrine falcon *Falco peregrinus* and swift *Apus apus*. Among 54 regular visitors are goshawk *Accipiter gentilis*, white-tailed eagle *Haliaeetus albicilla* and great cormorant *Phalacrocorax carbo*. 300 butterfly species are recorded, also the agile frog *Rana dalmatina*. The rich insect life of Serrahn includes 428 species of wood beetle. As an old hunting reserve, Grumsin has wild boar *Sus scrofa*, mouflon *Ovis orientalis musimon* and fallow, red and roe deer *Dama dama*, *Cervus elaphus* and

*Capreolus capreolus*. Wolves *Canis lupus*, slowly returning from Eastern Europe, have been seen locally. Birds include white-tailed eagle, lesser spotted eagle *Aquila pomarina*, osprey *Pandion haliaetus*, crane *Grus grus* and black stork *Ciconia nigra*. Hainich was also a hunting forest and has fallow deer and mouflon but also Eurasian lynx *Lynx lynx* and wildcat *Felis sylvestris*, the near threatened Bechstein's bat *Myotis bechsteinii* and barbastelle. Hen and marsh harriers *Circus aeruginosus* and *C. cyaneus*, merlin *Falco columbarius*, boreal owl *Aegolius funereus* and great bittern *Botaurus stellaris*; also great crested newt *Triturus cristatus*. Kellerwald also has records of lynx and wildcat, fifteen bat species, six woodpeckers, 822 butterflies and 876 species of beetle.

## CONSERVATION VALUE

The Carpathian stands of a virgin forest of great size, beauty, integrity, abundant ecological processes and undisturbed habitats are an important part of Europe's temperate forest heritage which from now on will probably always be well managed. The eastern reserves lie within a WWF Global 200 Eco-region and a UNESCO Biosphere Reserve. The German parks illustrate the best remaining examples of post-glacial evolution of beech forests under varying conditions in their ancient heartland, and lie within two WWF Global 200 Eco-regions. All fifteen reserves are Natura 2000 sites.

## LOCAL HUMAN POPULATION

There are no people living in the Slovakian/Ukrainian sites and in the Slovakian region the highlands are being deserted by herders. But there are ten villages and some 17,660 people in the buffer zones, mostly near Vihorlat and Havesova. In Ukraine the western section is more densely inhabited with 12 small villages, in the eastern section there are 17 nearby settlements with nearly 400 people, and about 50,000 people live in the nearby towns of Rakhiv (15,200) and Khrust (32,300). Most local people work in shepherding, agriculture and forestry. There are no people living in the German sites and very few in the buffer zones. The surrounding countrysides are sparsely populated except around Jasmund.

## VISITORS AND VISITOR FACILITIES

**Slovakia/Ukraine:** There is a well-developed network of good roads and tourist trails and the region is visited by some 80,000 people a year, 30,000 in the Poloniny National Park and 50,000 in the Ukrainian sites. But few ecotourists use the trails; most visitors are local people who take the forests for granted and use them for hiking, camping, hunting and fishing. A Museum of Carpathian Ecology has been built at Rakhiv near the Carpathian National Park. Accommodation and services are available in Rakhiv which is on a railway. In Slovakia there is a visitors' centre in Nová Sedlica in the Poloniny National Park. Expert guidance is also provided by the Centre for Scientific Tourism of the Slovak Academy of Sciences.

**Germany:** In 2007 the total of all visitors to the four protected areas surrounding the National Parks was 2,237,000. The total of visitors to the four National Park sites was 736,600 of which 47% (343,300) stayed overnight. Jasmund on the Baltic which had 1-1.5 million visitors with 398,600 (54%) to the National Park itself, was the most popular, then Serrahn with 167,000, Hainich with 119,000 and Kellerwald with 52,000. Visitors to Grumsin number some 200-400, mostly scientists. Municipalities and nature conservation bodies contribute to educational exhibits. The larger visitor facilities are located outside the World Heritage sites. The Königsstuhl National Park Centre at Jasmund has a multimedia exhibition, recreational activities and short guided educational coach tours. There are 40 km of hiking, 23 km of cycling and 14 km of bridle trails with information boards and protective walkways across valleys and mires. Serrahn has a watchtower and refuge and the same but fewer facilities and shorter trails. Grumsin is connected to longer distance paths and cycling trails but has no visitor facilities except for a 10-km distant Biosphere Reserve visitor centre. Hainich has a popular tree-top trail, 19 km of hiking-cycling-riding trails and a small refuge. Kellerwald has a historic hunting lodge and some 24 km of mixed use trails in the adjoining reserve. There are a visitors' centre, an educational centre and small exhibition outside the site.

## SCIENTIFIC RESEARCH AND FACILITIES

**Slovakia/Ukraine:** A basic survey of the floristic and phytosociology of the Biosphere Reserve has been completed, and investigations of fungi, avifauna, and selected invertebrate taxa are continuing. Important forestry research has also been undertaken by the Technical University in Zvolen using permanent research plots. Inventorying the flora and fauna is an essential part of this research. The Slovak Hydrometeorological Institute has several climatic and hydrological stations, and there are permanent plots for monitoring the health of forests and meadows. A common Geographic Information

System database is being established as a means to approach the East Carpathians as a coherent whole, to unify wildlife inventory methodologies and databases and facilitate common decision-making. In Ukraine some 20 scientists work with technical assistants and forest guards as monitors. In Slovakia 30 scientists from several institutes work on long-term programs both independently and in affiliation with the Park administration.

**Germany:** There is in the parks an emphasis on educational study for the young and an extensive array of academic research projects. Among the five sites are ongoing and published studies with scientists from over twenty universities, technical institutes and state offices. The following researches are or have been conducted by staff from the following universities. Jasmund: on forests, nature conservation, land use, moor protection and water management by university staff from Greifswald, Eberswalde, Hanover and Berlin. Serrahn: on forests, nature conservation, moors, water balance and open landscape vegetation by staff from the universities of Neubrandenburg, Rostock, Greifswald, Halle, Lüneburg and Dresden. Grumsin is the best-researched woodland in Brandenburg with a host of studies in forest ecology and forest dynamics by researchers from the universities in Eberswalde and Potsdam. Hainich: on forest dynamics, the ecology of mixed populations, carbon turnover and biodiversity by university staff from Freiburg, Göttingen, Jena and the Max Planck Institute. Kellerwald: on permanent sample inventory, natural forest reserves, beech genetics, hoofed game, freshwater ecology and fungus by staff from the Senckenberg Society, the Northwest German Forest Research Station, and the universities of Marburg, Göttingen and Kassel.

## MANAGEMENT

**Slovakia/Ukraine:** Their remoteness and restricted accessibility have preserved the primeval character and ecological complexity of these forests. The serial sites enjoy protection as a whole and are managed jointly as Strictly Protected Nature Reserves, under the Ukrainian Law on the Protected Areas Network of Ukraine, No.2456-XII of 1992 and by the Slovakian Nature and Landscape Protection Act No.543 of 2002. These are enforced in Slovakia by the State Nature Conservancy in Poloniny National Park and Vihorlat Landscape Protection Area; and in the Ukraine by the administrations of the Carpathian Biosphere Reserve and the Uzhanski National Nature Park. With the Polish Park service across the border, this exemplifies trilateral transboundary co-operation under difficult political and economical circumstances.

To support the area, both sustainable agriculture and profitable ecotourism are needed. The existing focus of the area's Joint Management Committee is on the reserve management, monitoring and protection, mountain meadow maintenance and protection, conservation of monumental old trees, management of river corridors and water ecosystems; also the lowering of the impact of tourism on core areas, and providing training in ecotourism, management skills for local entrepreneurs and in the restoration of historic buildings. Monitoring of air, water and soil quality and of biota of all kinds has long been done and is being systematised. A further aim is to balance institutional management with the participation of stakeholders to benefit local populations, involving their interest through educative 'green diplomacy', GPS-aided educational trails and an interactive internet site. The development of sustainable tourism in future will only be successful if all the partners follow a common strategy in the provision of services.

In addition to the gradual introduction of a policy of non-intervention with natural processes, a long-term aim is to establish protected corridors connecting the scattered sites from a mosaic of largely continuous natural and semi-natural forests. In the Ukraine many of them will become protected areas as part of the pan-European ecological network. In Slovakia, following nomination, the management of corridors in protected areas will be upgraded. This will be easiest where sites are already close together and joined by protected state forests. A transboundary Integrated Management Plan will be implemented in the Ukraine by Coordination Councils, and in Slovakia by a Joint Management Committee through the Presov Autonomous Region administration. The process will start with participation by municipal representatives and continue with the support of citizens, NGOs and other stakeholders. In the future the World Heritage site might link with the forests of the adjoining Bieszczady National Park in Poland and later still with forest parks across the border in Romania.

**Germany:** The sites are governed by the National Nature Conservation Act of 2002, and by federal state, national park and municipality regulations, and by EU directives on birds and habitats. Grumsin is also subject to Biosphere Reserve ordinances. All have masterplans, which will preserve the condition

of unmanaged growth, allowing for dead trees as natural microhabitats and centres for species dispersal. The buffer zones will also remain largely unmanaged except for the regulation and culling of hoofed stock such as deer, hogs and mouflons which damage young stands. The plans incorporate measures for monitoring environmental parameters and biodiversity, forest condition and flora, wildlife and game and visitor numbers and impacts. All plans were developed with public involvement.

An Integrated Management System will be established for the coordinated management and sustained conservation of the tri-national property, which will link its component parts and run programs for transnational research, capacity building and monitoring. This will be done under a Joint Management Committee from the four federal state ministries and the National Park and Biosphere Reserve administrations under the Federal Ministry for the Environment and the Federal Agency for Natural Conservation in Germany in cooperation with the existing Slovakian-Ukrainian Joint Management Committee, the Slovakian Ministry of the Environment and State Nature Conservancy and the Ukrainian Ministry of Environmental Protection.

## MANAGEMENT CONSTRAINTS

There are few negative pressures on the forests apart from occasional fires and storms which may damage exposed beech trees owing their shallowrootedness. In the eastern sites there is some illegal tree-cutting and poaching and the abandonment of grazing on the high meadows will cause their reversion to scrub unless countered. But in Germany the policy of limited management will gradually remove grazing stock and allow natural growth. The thousands of local visitors may come to exert the most telling pressure on park managements in future although in Germany these are well provided for by large staffs of rangers, nature conservation wardens and volunteers.

## COMPARISON WITH SIMILAR SITES

The main bases for comparison with similar existing World Heritage temperate forest sites are:

- Criterion (vii) The beauty of the tall cathedral-like forest
- Criterion (ix) The importance of the forests' ecological processes measured by:
- in the eastern sites, the almost unparalleled extent, size and undisturbed nature of the predominant beech forests;
  - especially in the western sites, the variety of their long-studied biological and ecological processes, substrates and habitats, which are comparable with other undisturbed forests;
  - the existing integrity of the sites, including the gene pools and the potential for their effective maintenance, which is high;
- Criterion (vii) The diversity of the biota, which contains many national endemics but is not exceptional.

Within the same region as the Carpathian beech forest the only World Heritage site is Bialowieza/Belovzshkaya Pushcha, a mixed forest with many of the same species and a higher faunal diversity, but virtually no beech forest. Several southern European have beech woods: Plitvice is the nearest in latitude and size, three-quarters forested, of which 72.8% (16,100 ha) is predominantly *F. sylvatica*. Mont Perdu, Pirin, Durmitor and the Western Caucasus (*Fagus orientalis*) have beech but in mixed forests. The closest comparison is that with the virgin Japanese *Fagus cretica* beech forest of Shirakami-Sanchi in northwestern Honshu which was designated for a very similar reason. There are World Heritage temperate forests elsewhere, several in warm temperate south China, but they are mixed forests of a very different range of trees. The virgin temperate mixed forest sites of the Great Smoky Mountains and the far larger and more biodiverse Sikhote-Alin have abundant wildlife but beech is not a dominant species and the sites were not designated for that reason alone.

## STAFF

**Slovakia/Ukraine:** In the Ukraine the Carpathian Biosphere Reserve and the Uzhanski National Nature Park staff have 310 and 110 employees respectively to protect the reserves, including buffer and development zones. There are also 200 forestry officers in charge of forest protection. In Slovakia the staff in the Poloniny National Park and the East Carpathians Protected Landscape Area numbers 24. These number 16 graduate natural scientists and forest ecologists responsible for management and research plus 8 rangers for patrolling the four sites, assisted by 32 voluntary nature protection guards. Expert management is reinforced by the cooperation of the Centre for Nature and Landscape Protection



of the State Nature Conservancy. Highly qualified and well equipped staff Forest District staff are responsible for the management of buffer zones and corridors between the properties.

**Germany:** The National Parks have well qualified and experienced professional and technical staff, with established ranger forces and conservation wardens for park protection and the education of visitors:

- Jasmund National Park: 18 forest managers (11 certified nature & landscape guides); 2 administrative officials, 4 graduates: 3 forest engineers and 1 marine biologist.
- Serrahn National Park: 2 graduate forest engineers, 8 rangers (certified nature & landscape guides), 8 forest managers.
- Grumsin site: 4 nature watch employees, 1 forest engineer, 1 district forester, 2 certified landscape guides.
- Hainich National Park: 2 district directors, 8 administrative employees, 25 forest rangers (some nature and landscape managers), 150 trained volunteer nature guides.
- Kellerwald-Edersee National Park: 6 graduated forest engineers, 18 rangers (forest managers with nature and landscape manager qualification), 1 biologist, 1 agriculturist,

Regular professional training is offered to the staff of all national parks. Volunteers are largely drawn on.

## BUDGET

**Slovakia/Ukraine:** The Ukrainian budget for these reserves in 2004 was approximately US\$700,000. In future the two governments will allocate EUR25.000 (US\$32,000) annually to fund the Joint Management Committee and the Integrated Management Plan, based on the Action Plan submitted annually. Projects such as habitat reconstruction and ecotourism development will be funded separately. Programs are planned for the in-field training of scientific staff. The establishment of the transboundary Biosphere Reserve in 1992 was funded by the MacArthur Foundation and the GEF.

**Germany:** Adequate annual budgets totalling over €12 million in 2010 exist for the sites of the extension: €8,707 for personnel and €3,382 for materials. Additional funds may become available from European Union programs, foundations, municipalities, nature conservation organizations and from direct donations.

## LOCAL ADDRESSES

### **Slovakia/Ukraine:**

Ministry of Environmental Protection of Ukraine, 35 Uryts'kogo Str. 03035 Kyiv, Ukraine.

Carpathian Biosphere Reserve, 77, Krasne Pleso Str., 90600 Rakhiv, Ukraine.

Direction of National Nature Park Uzhans'ki, Shevchenka St. 54, 295050 Velykij Bereznyi, Ukraine.

State Nature Conservancy of the Slovak Republic 10 Lazovná Street, P.O. BOX 5, 974 01 Banská Bystrica, Slovakia.

Administration of National Park Poloniny, P.O. Box 47 - Partizánska 1057 069 01 Snina, Slovakia.

### **Germany:**

Jasmund: Western Pomerania National Park Office, Im Forst 5, 18375 Born, Mecklenburg-West Pomerania.

Serrahn: Müritz National Park Office, Schlossplatz 3, 17237 Hohenzieritz, Mecklenburg-West Pomerania.

Grumsin: Schorfheide-Chorin Biosphere Reserve, Hoher Steinweg 5 - 6, 16278 Angermunde, Brandenburg.

Hainich National Park Office, Bei der Marktkirche 9, 99947 Bad Langensalza, Thuringia.

Kellerwald-Edersee National Park Office, Laustrase 8, 34537 Bad Wildungen, Hesse.

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#### **DATE**

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