

**CONSERVATION STATUS AND FUTURE PERSPECTIVES OF THE FOREST
COMMUNITIES OF *TILIO PLATYPHYLLIS-ACERION PSEUDOPLATANI* KLIKA 1955
ALLIANCE IN THE SUDETES AND THEIR FOOTHILLS**

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ABSTRACT: The paper presents the results of monitoring of conservation status and future prospects of the forest communities of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 alliance. Habitat assessment was conducted in 2006-2008 in the Sudetes and their foothills (SW. Poland). The condition of each habitat site was assessed using four parameters: area covered by the community, typical structure and functions, future prospects and global assessment. In all, 85 sites were assessed, 69 with basic monitoring and 16 with detailed monitoring. The basic monitoring showed that the analysed communities in the Wałbrzych-Bolków Foothills, the Złote Mts, the Wałbrzych Mts and the Nysa Kłodzka River Valley were in good condition, with proper conservation status and prospects, as opposed to the communities in the Izera Foothills, the Kaczawa Mts, the Kaczawa Foothills, the Bialskie Mts, the Śnieżnik Massiff and the Kamienne Mts. Application of detailed phytosociological methods and transect analysis during the detailed monitoring caused a decrease in the assessed state value. Conservation status and prospects were estimated as bad for the investigated communities in the Bialskie Mts and the Śnieżnik Massiff and as unfavourable for communities in the Nysa Kłodzka River Valley and the Bardo Mts.

KEY WORDS: biodiversity monitoring, conservation biology, forest communities, habitat monitoring, Natura 2000, nature conservation, plant communities, protected habitats, Sudetes Mts., *Tilio-Acerion*

Introduction

Monitoring of conservation status and future prospects of the forest communities of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 was conducted in 2006-2008 in the Sudetes and their foothills.

Tilio-Acerion ravine forests are composed of *Tilia platyphyllos*, *Acer pseudoplatanus*, *Fraxinus excelsior*, *Ulmus glabra* and *Tilia cordata*. Such forests typically occur on nutrient-rich soils which often accumulate in shaded situations on bottoms and slopes of ravines. They are found on both calcareous and non-calcareous substrata, associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. They often occur as a series of scattered patches grading into other types of woodland at the level of valley floors and on the slopes above. More extensive stands occur on limestone and other base-rich rocks.

Study area

The study area included the Sudetes and their foothills. The sites to be assessed were located in formerly known and investigated patches of communities (Anioł-Kwiatkowska and Świerkosz 1992; Berdowski and Panek 2001; Fabiszewski 1968; Fabiszewski et al. 1997; Kuczyńska and Macicka 1984; Kwiatkowski 1993, 1995a, 1995b, 1996, 1997, 2001; Pender and Macicka-Pawlik 1996a, 1996b; Szczęśniak 1997, 1998; Świerkosz 1994, 2001, 2003), especially within the regions of the highest concentration of *Tilio-Acerion* forests: the Kaczawa Mts, the Kaczawa Foothills, the Wałbrzych-Bolków Foothills, the Bardo Mts, the Stołowe Mts, the Śnieżnik Massif, the Bialskie Mts, the Kamienne Mts, the Nysa Kłodzka River Valley and the Izera Foothills (Kondracki 2002). During the fieldwork many new sites of *Tilio-Acerion* forests were discovered.

Subject of investigation

All communities of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 alliance recognized within the area of the Sudetes were subject to investigation:

- *Lunario-Acerion pseudoplatani* (Moor 1973) suballiance: *Phyllitido-Aceretum* Moor 1952, *Lunario-Aceretum* Grüneberg and Schlüt. 1957, *Acer pseudoplatanus-Aruncus sylvestris*;
- *Tilienion platyphylli* (Moor 1975) Th. Müller 1992 suballiance: *Aceri platanoidis-Tilietum platyphylli* Faber 1936;

The regional diversity and distribution of the listed communities were dealt with in the papers cited above, while an overview was presented by Kozłowska and Matuszkiewicz (1993), Matuszkiewicz (2001) and Bodziarczyk and Świerkosz (2004). Additionally, two new communities were documented and described, but more detailed research is needed to specify their diversity and syntaxonomic status. The communities were temporarily termed *Acer pseudoplatanus – Galium odoratum* and *Actaea spicata – Acer pseudoplatanus*.

Methods

Three main parameters were used to assess conservation status of the communities in each site: i) area covered by the community, ii) structure and functions typical for the

community and iii) future prospects. The ‘global assessment’ for the site was based on these parameters. According to the recommendations of the European Commission for habitat monitoring (Anonymous 2005), each parameter was assigned to one of the following four classes: FV – Favourable, U1 – Inadequate, U2 – Bad and XX – Unknown.

When evaluating the first parameter it was important whether the community covered all the accessible area or was partly altered by human activities (spruce or beech monocultures introduced, presence of unforested logging areas).

The ‘future prospects’ parameter was to assess protection perspectives of the site and possibilities to maintain its present condition, considering all factors actually influencing the site. The observed tendencies, biotic and anthropogenic influences, as well as management plans and tourism were taken into account. Because of the lack of comprehensive information for each site (e.g. management plans), the value of this parameter could be only roughly estimated. Location of the site within a nature reserve or on an extremely steep slope seemed to guarantee its good or very good prospects. On the other hand, some land use-related threats may emerge in the future, such as dam reservoirs, rubbish heaps, slanting roads etc.

The ‘structure and function’ parameter is the most complex and was measured based on the following components:

- percentage of the area covered by the community;
- presence of typical combination of characteristic species of association and alliance;
- occurrence of expansive plant species;
- occurrence of tall herbs and nitrophilous plants;
- age of the stand (presence of trees aged more than 100 years);
- presence of young generation of trees;
- vertical vegetation structure;
- occurrence of invasive species;
- occurrence of alien tree species;
- logging and other alterations caused by forest management;
- presence of natural habitat complex.

Each of the components was assigned to one of the mentioned classes (FV, U1, U2, XX) and then the value of the parameter was assessed.

The ‘global assessment’ summarizes the three main parameters.

Scope

In 2006 introductory fieldwork (basic monitoring) was conducted, aimed at a general description of the known sites of *Tilio-Acerion* forests, assessment of community conditions following the described methods and selection of sites for more detailed research. At that stage 69 sites were investigated, including 11 in the Eastern Sudetes (contributor: R. Pielech), 42 in the Central Sudetes and the Włabrych-Bolków Foothills (K. Świerkosz, R. Pielech, Z. Gołąb) and 16 sites in the Western Sudetes and their foothills (K. Świerkosz, K. Reczyńska).

In 2007-2008 the selected sites were subject to detailed research (detailed monitoring). A transect 200 metres long was set in each site, and three phytosociological relevés were made, following the Braun-Blanquet approach (Westhoff and van der Maarel

1978). The work yielded description of 16 sites, including 2 in the Eastern Sudetes (the Bialskie Mts – contributor: R. Pielech), 8 in the Western Sudetes (the Kaczawa Mts and their foothills – K. Świerkosz and K. Reczyńska; the Izera Foothills – K. Reczyńska) and 6 in the Central Sudetes (the Nysa Kłodzka River Valley – M. Hadryś, the Bardo Mts. – M. Malicki)

Results

The results of the basic and detailed monitoring of *Tilio-Acerion* forests in the Sudetes are summarized in tables 1 and 2.

Conservation status and prospects of the investigated communities were assessed as favourable (FV) within the area of the Wałbrzych-Bolków Foothills, the Złote Mts, the Wałbrzych Mts and the Nysa Kłodzka River Valley. The investigated communities of other regions (the Izera Foothills, the Kaczawa Mts, the Kaczawa Foothills, the Bialskie Mts, the Śnieżnik Massiff, the Kamienne Mts) were estimated as unfavourable.

Detailed monitoring revealed that application of more precise methods as well as transect analysis resulted in a decrease in the assessment. This was true of the communities of the Nysa Kłodzka River (FV to U1), the Bialskie Mts, the Śnieżnik Massiff and the Izera Foothills (U1 to U2).

The investigated sites covered by a forest dominated by sycamore, maple and large-leaved lime are typical for mountain and upland areas and are generally resistant to human alterations. In spite of this the communities may be disturbed directly (forest management, tourism) and indirectly (roads).

Threats to the communities of *Tilio-Acerion* alliance were noted mainly outside the protected areas:

- influence of tourist trails – usually not very intensive but possibly conducive to synanthropisation and eutrophication, trampling, wiping out endangered plant species (*Phyllitis scolopendrium*). Noted in 11 areas;
- influence of roads – spreading of alien plant species, air pollution and habitat fragmentation. Noted in 7 areas;
- possible influence of projected dam reservoirs in the Kaczawa Mts, the Wałbrzych-Bolków Foothills, the Bialskie Mts and the Izera Foothills;
- impact related to nearby buildings – sewage, waste, intensive exploration, fragmentation. Noted in 5 areas;
- different types of forest management treatments (plantations, shrub removal, logging, dead wood removal), observed in 6 areas with different intensity.

The forest communities of the *Tilio-Acerion* alliance are subject to natural disturbances, especially on steep slopes, where fallen and dead trees are common. Such disturbances are necessary for the development of sycamore, rowan and large-leaved lime as well as a group of mountain tall herbs – specific components of this forest type.

Conclusion

In spite of occurring as small patches, the sycamore maple-lime forests are not threatened within the whole area of their occurrence. Conservation treatment is required only in some mountain ranges, especially in the Bialskie Mts, the Kamienne Mts and the Izera Foothills.

Passive conservation is the best way to protect the *Tilio-Acerion* forests. Comparison of the results of basic and detailed monitoring shows that application of more precise phytosociological methods results in a decrease in conservation state and future prospects assessment.



Fig. 1. Locality of *Aceri platanoidis-Tilietum platyphylli* Faber 1936 on Ostrzyca Proboszczowicka - favourable conservation status (fot. K. Świerkosz 28.10.2006)

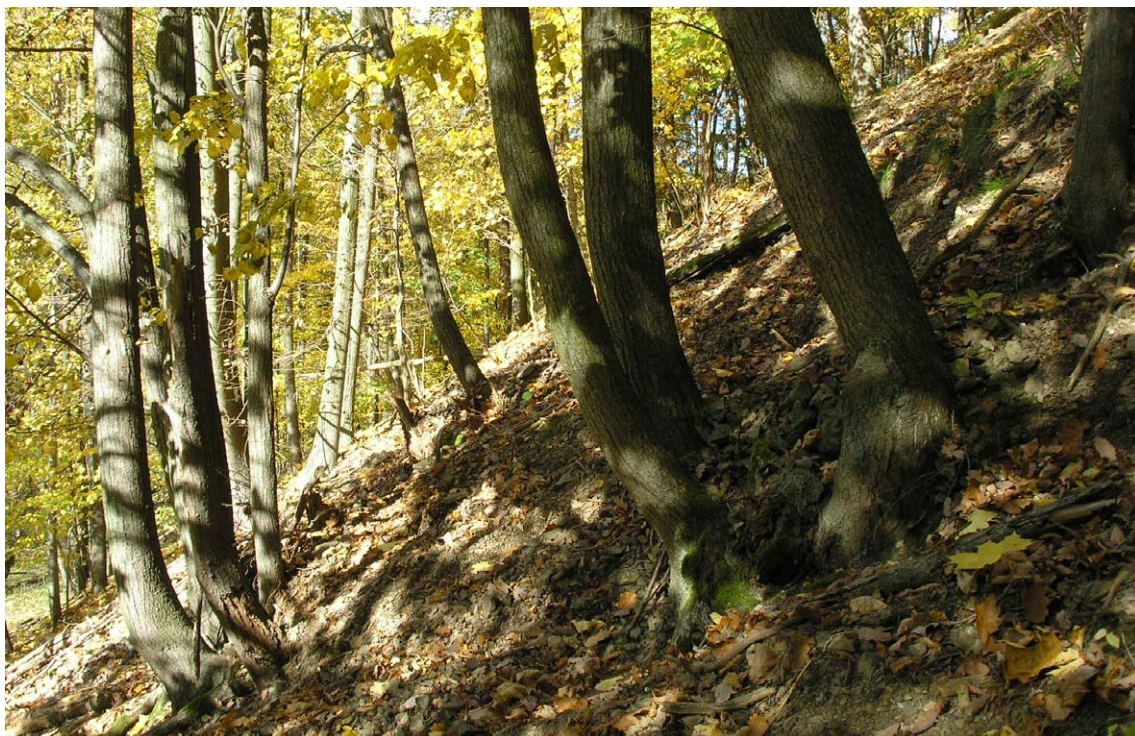


Fig. 2. Locality of *Aceri platanoidis-Tilietum platyphylli* Faber 1936 in the Czyżynka Valley (Dobromierz area) - favourable conservation status (fot. K. Świerkosz 24.10.2006)

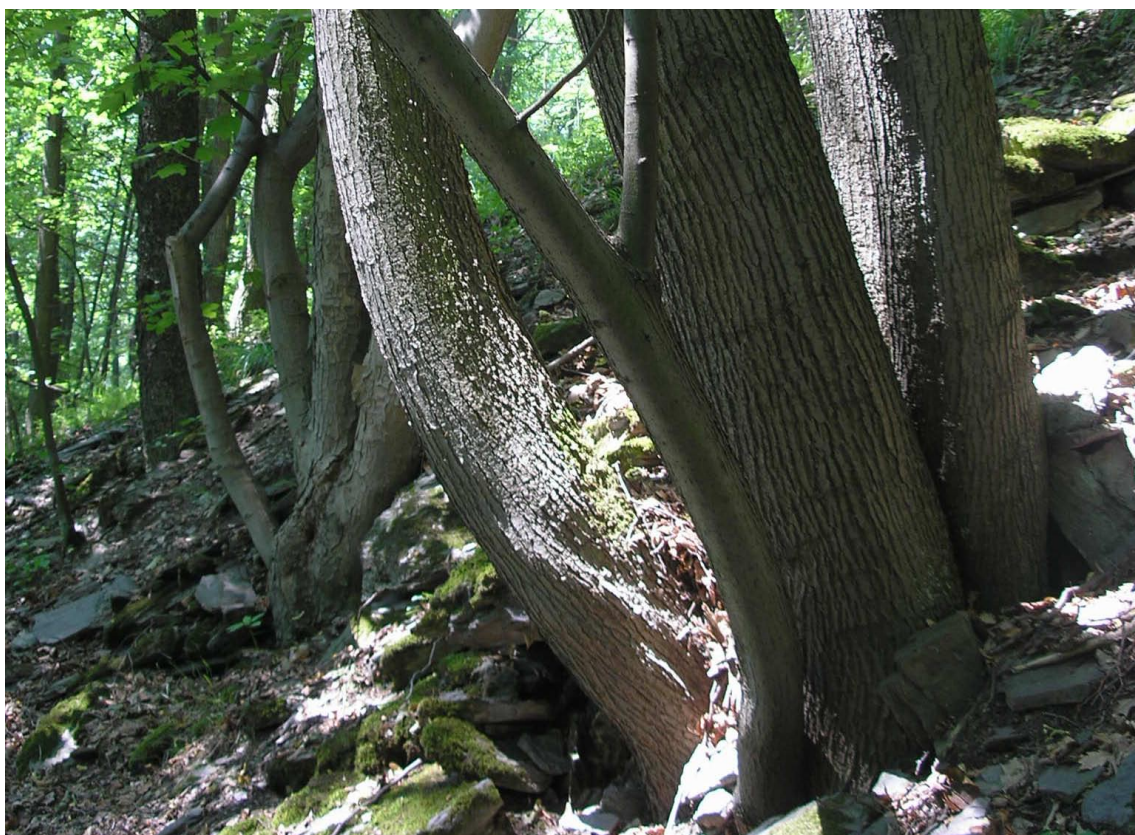


Fig. 3. Locality of *Aceri platanoidis-Tilietum platyphylli* Faber 1936 in the “Nad Groblą” nature reserve (Kaczawa Mts and Foothills) - favourable conservation status (fot. K. Świerkosz 03.06.2006)



Fig. 4. Locality of *Aceri platanoidis-Tilietum platyphylli* Faber 1936 in the Nysa Kłodzka Valley (Nysa Kłodzka ravine near Morzyszów) - favourable conservation status (fot. K. Świerkosz 10.10.2006)

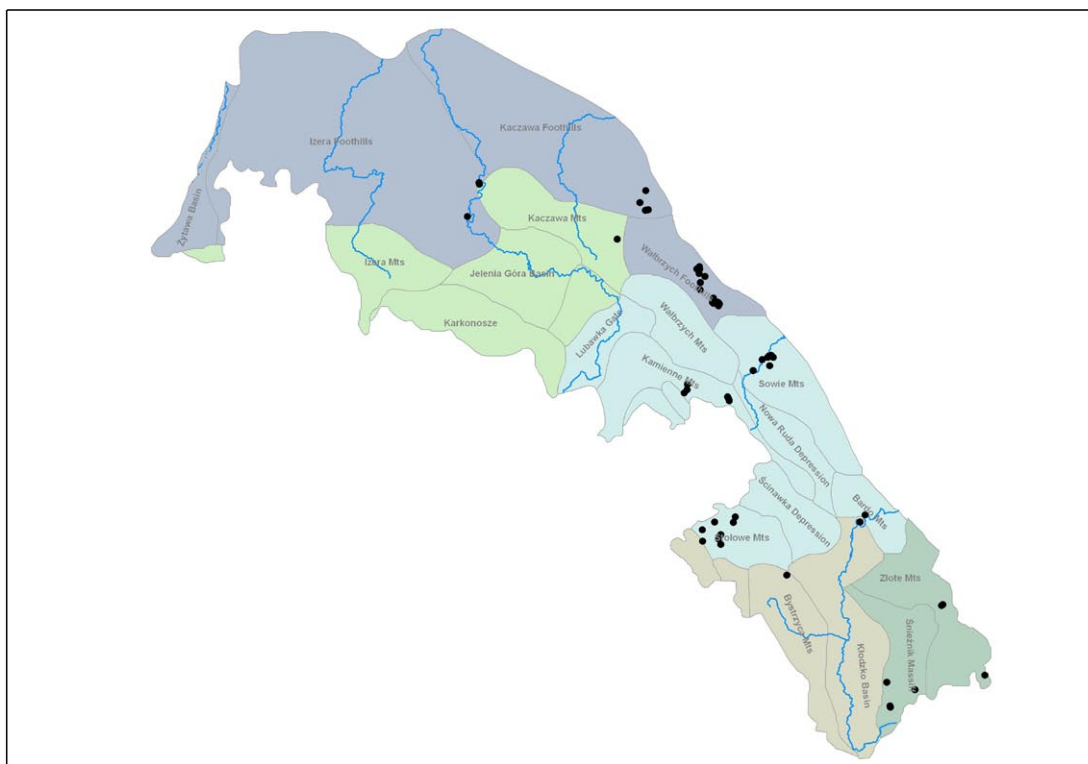


Fig. 5. Distribution of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 alliance patches subject to basic monitoring.

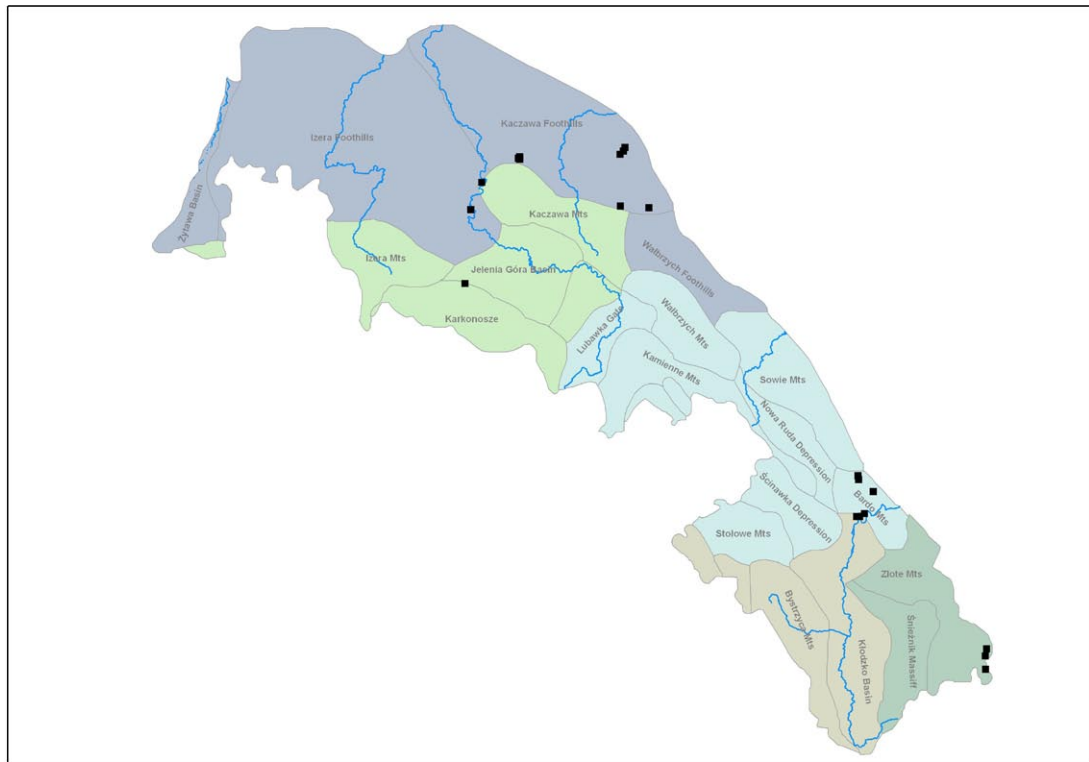


Fig. 6. Distribution of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 alliance patches subject to detailed monitoring.

Table 1. Results of basic monitoring of forest communities of *Tilio platyphyllis*-*Acerion pseudoplatani* Klika 1955 alliance in the Sudetes and their foothills.

Mountain range	the Wabrzzych Mts	the Nysa Kłodzka River Valley	the Złote Mts.	the Kamienne Mts	the Kaczawa Mts and their foothills	the Śnieżnik Massif and the Bialskie Mts	the Wabrzzych-Bolków Foothills	the Stolowe Mts	the Izera Foothills
Investigated plant communities	<i>Aceri-Tilietum</i> , <i>Lunario-Aceretum</i>	<i>Aceri-Tilietum</i>	<i>Aceri-Tilietum</i>	<i>Lunario-Aceretum</i> ; comm. <i>Acer pseudoplatanus</i> – <i>Galium odoratum</i> , comm. <i>Actaea spicata</i> - <i>Acer pseudoplatanus</i>	<i>Aceri-Tilietum</i> ; <i>Phyllitido-Aceretum</i>	<i>Lunario-Aceretum</i> ; comm. <i>Aruncus dioicus</i> - <i>Acer pseudoplatanus</i>	<i>Aceri-Tilietum</i>	<i>Lunario-Aceretum</i> , <i>Aceri-Tilietum</i> , comm. <i>Aruncus dioicus</i> - <i>Acer pseudoplatanus</i>	<i>Aceri-Tilietum</i>
Number of sites	6	9	15	9	10	6	2	5	7
Parameters									
1. Habitat area within the region	U1	U1	FV	U1	FV	FV	FV	FV	FV
2. Typical structure and functions, including:	U1	U1	FV	U1	U1	U1	FV	FV	FV
a) characteristic species	FV	FV	FV	FV	FV	FV	FV	FV	FV
b) expansive and invasive species	U1	U1	U1	U1	U1	U1	U1	U1	U1
c) tall herbs and nitrophilous plants	FV	FV	FV	FV	FV	U1	FV	FV	FV
d) vertical structure of vegetation	FV	FV	FV	U1	FV	U1	FV	FV	FV
e) age of the stand	FV	U1	FV	U2	FV	FV	FV	FV	FV
f) alien tree species	U1	U1	FV	FV	XX	U1	FV	FV	FV
g) young generation of trees	FV	FV	FV	FV	U1	U1	FV	FV	FV
h) tree cuttings	FV	FV	FV	U1	FV	U1	FV	FV	FV
Future prospects	U1	U1	XX	FV	XX	U1	FV	FV	FV
Global assessment	U1	U1	FV	U1	U1	U1	FV	FV	FV

Table 2. Results of detailed monitoring of forest communities of *Tilio platyphyllis-Acerion pseudoplatani* Klika 1955 alliance in the Sudetes and their foothills.

Mountain range	the Bardo Mts	the Śnieżnik Massif and the Białskie Mts	the Nysa Klodzka River Valley	the Izera Foothills	the Kaczawa Mts and their foothills
Investigated plant communities	<i>Aceri-Tilium</i>	<i>Lunario-Aceretum</i> comm. <i>Acer pseudoplatanus-Arnica sylvestris</i>	<i>Aceri-Tilium</i>	<i>Aceri-Tilium</i>	<i>Aceri-Tilium</i>
Number of transects	3	2	3	3	5
1. Habitat area within the region	U1	U2	FV	FV	FV
2. Typical structure and functions	U1	U2	U1	U2	FV
Percentage of the area covered by the community within the transect	U1	U1	FV	FV	FV
Characteristic species	U1	U1	FV	U1	FV
Invasive species	FV	FV	U1	U2	U1
Expansive species	U1	FV	FV	FV	FV
Tall herbs and nitrophilous plants	FV	FV	FV	U1	FV
Presence of old trees	U1	U2	FV	U2	FV
Presence of alien tree species	U1	U2	FV	U1	FV
Presence of young generation of trees	FV	U1	U1	FV	FV
Vertical vegetation structure	U1	U1	U1	U1	FV
Logging	U1	U2	U1	FV	FV
Natural habitat complex	-	U1	U2	U2	FV
Future prospects	U1	U1	FV	U2	U1
Global assessment	U1	U2	U1	U2	U1

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