Floristic richness and conservation priority sites in the northwest of European Turkey: Mt Yıldız-Kırklareli

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Abstract. The overall purpose of the Yıldız Mountain Biosphere Project is to assist landscape scale conservation of biodiversity of Mt Yıldız in a long-term plan. Floristically, flowering plants and ferns (vascular plants) were the focus of the field survey. A total of 1364 plant taxa (1273 species) have been recorded from the project area. Within the study area, 15 endemic taxa and 55 rare species have been recorded, including *Allium rumelicum* recently described as new to science (Koçyiğit & Özhatay 2010). Eleven floristic hotspots were assessed, identifying the İğneada and Kasatura areas as high-importance centres of plant diversity, their coastline and sand dune habitats supporting the highest diversity of rare and endemic species. Finally, four conservation priority sites and 14 core zones have been determined; threats to botanical interests have been assessed and conservation recommendations have been given.

Key words: conservation, flora, IPA, NW European Turkey, priority sites

Introduction

The rich flora of Turkey

Turkey is located on a large peninsula with a land surface of 779 452 km^2, bordering on three seas and extending both into Europe and Asia. Floristically, Turkey is one of the richest countries in the Western Palearctic Region. The vascular flora (flowering plants and ferns) of Turkey comprises about 10 000 species, with a high percentage of endemic taxa (34 %). A considerable number of taxa new to the country's flora, or new to science, have been described in the result of taxonomic or floristic studies in recent decades. Diversity of vascular plants of the country has been documented in the *Flora of Turkey and the East Aegean Islands* (Davis 1965–1985) published in nine volumes. After publication of this monumental work, many new taxa (either to science or to the Turkish flora) have been added. Identification of these additional taxa has necessitated the subsequent publication of supplementary volumes to the *Flora of Turkey* (Davis & al. 1988; Güner & al. 2000). The flora of Turkey continues to provide new information after publication of vol. 11. In the period up to 2011, 1015 taxa were added, including 700 taxa new to plant science and 315 taxa new to the Turkish flora (Özhatay & Kültür 2006; Özhatay & al. 2009, 2011).

Along with its rich flora, Turkey also has a wide diversity of habitats. However, the unique flora and habitats of Turkey have been threatened and have rapidly declined over the last 40 years. Rare and sensitive habitats such as coastal dunes, peatlands, wetlands, heathlands, grasslands, and old-growth forests are under immense threat and declining fast, including many areas that have yet to be surveyed (Akalın & al. 2010).

The flora of European Turkey

European Turkey is situated north of the Sea of Marmara, which is connected to the Black Sea and Aegean Sea via the Bosphorus and Dardanelles, respectively; the sea and the straits separate together Europe from Asia. The total area of Turkey in Europe (European Turkey or Thrace) lying to the north of the Dardanelles and Bosphorus is 23 500 km^2, whilst Asiatic Turkey (Anatolia) covers 755 952 km^2. In comparison with Turkey's general topography, European Turkey has generally low elevations. In the NE of the region, the range of Mt Yıldız (Mt Istranca) extends to SE Bulgaria, its highest point being Mahya Dag (1035 m). The importance of Mt Yıldız was recognized when in 1992, at a conference of the European Ministries for the Environment held in Lucerne (Switzerland), Mt Yıldız was identified as one of the five most important areas in Central and East Europe for conservation of Europe's natural heritage.

The overall objective of the Yıldız Mountain Biosphere Project is "Sustainable cross-border cooperation developed and strengthened for conservation and sustainable development of natural resources and biodiversity of the Yıldız Mountain". Its purpose is "to serve the long-term and large-scale protection of biodiversity of Mt Yildiz…". One of the eleven activities of the project is floristic survey and management planning of Mt Yildiz as a Biosphere Reserve. This paper is aimed to describe the priority sites and threats on the basis of field work carried out between May and October 2009, so as to identify and assess the vascular flora and vegetation. Most of the mountain in Bulgaria (1161 km^2) was set in 1995 as the Strandzha Nature Park.

Material and methods

Study area

The Project area comprises the proposed Biosphere Reserve in Mt Yildiz, which is located in the province of Kırklareli, in the northwestern corner of Turkey and covers about 1300 km^2 (Fig. 1).

The field work comprised a floristic survey using standard methodology. Surveys were confined to sites of potential significance for plant diversity, identified earlier at a workshop during the formative phase of the Project. Of these 12 hotspots, three had been surveyed in recent years by the Central Anatolian For-

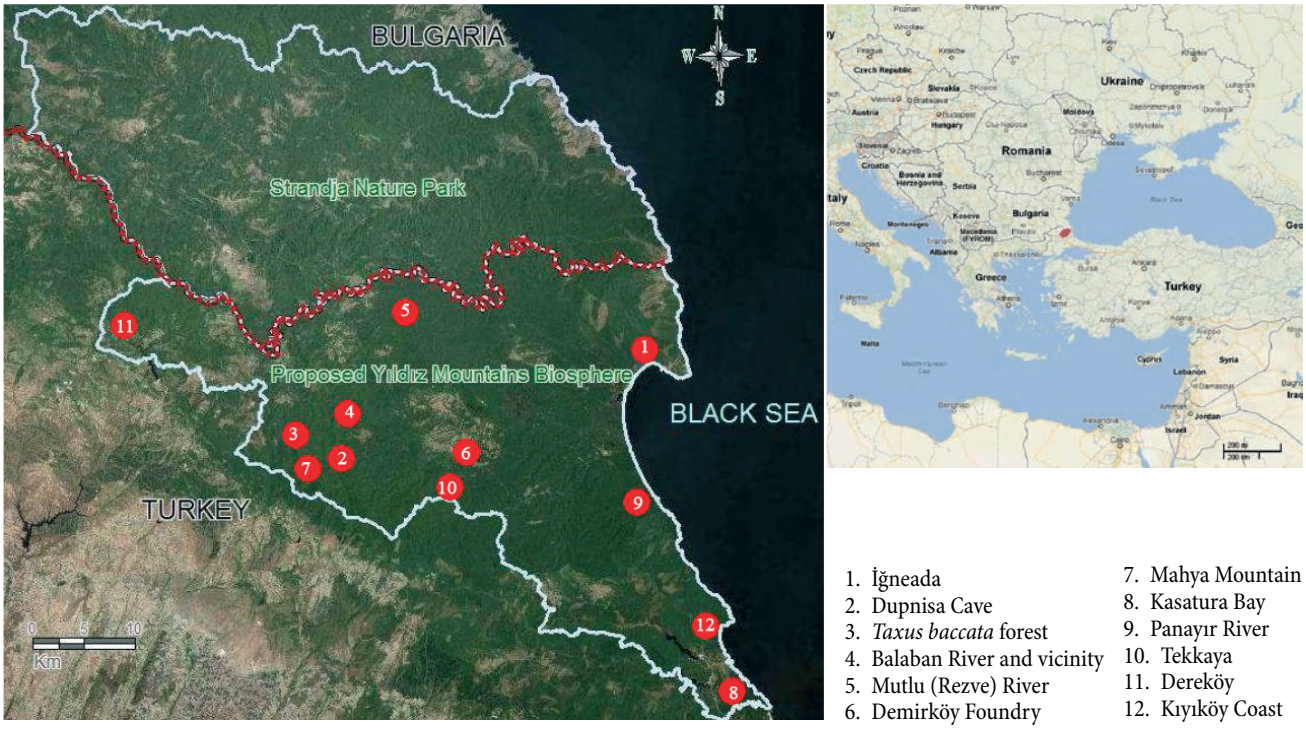

Fig. 1. Project area and survey locations from which plant specimens were collected during the Yildiz Mountain Biosphere Project (5-12), GEF II Project (1) and UNESCO Project (2-4).

estry Research Institute UNESCO Project (2.-4. Hotspots), one (1. Hotspots, İğneada Longoz Forest) by the GEF II Project, and the remaining eight were inventoried under the Yıldız Mountain Biosphere Project. The plant material was collected from hotspots 5 to 12, which are shown in Fig. 1. Demirköy Foundry is not significant in this respect though its cultural heritage is important.

Data

About 2550 plant specimens were collected and deposited as herbarium vouchers in ISTE and EDTU Herbaria. The collected material was determined using the basic Floras such as: *Flora of Turkey and the East Aegean Islands* (Davis 1965–1985; Davis & al. 1988; Güner & al. 2000), *Flora Europaea* (Tutin 1964–1980), *Prodromus Florae peninsulae Balcanicae* (Hayek 1924–1927, 1928–1931, 1932–1933), and Bulgarian Floras (Jordanov 1963–1979; Velčev 1982–1989; Kožuharov 1995).

A check list of vascular plant species was prepared on the basis of the results of this survey and earlier studies: **published papers** (Stefanoff 1921, 1924; Turrill 1924; Stojanov 1928; Tutin & al. 1964–1980; Davis 1965–1985; Webb 1966; Dönmez 1968; Demiriz & al. 1969; Özhatay 1975; Kurter 1983; Baytop 1986, 1973a, 1973b, 1981; Davis & al. 1988; Seçmen & Leblebici 1991; Başak 1993; Alpınar 1994; Baytop & Byfield 1997; Yarcı 1997, 1999; Güner & al. 2000; Grauter & Raus 2002; Özhatay & al. 2003, 2009, 2011; Başak & Kıyıcı 2004; Tzonev & al. 2005; Özhatay & Kültür 2006; Tuzlacı & Bulut-Emre 2006; Kavgacı 2007a; Kavgacı & al. 2007; Yılmaz & Dane 2007; Yıldız 2009; Doğan & al. 2010; Güler & al. 2010), **theses** (Kavgacı 2007b; Demir-Oral 2010), **and projects** (GEF II: Duman, H. (Coordinator) (2005) Final Report on the Flora and Vegetation of İğneada, supported by the Republic of Turkey, Ministry of Nature and Forestry, Biodiversity and Natural Resource Management, Ankara (in Turkish), UNESCO Türkiye: Öztekin, M. (2009) The List of Project Conservation and Sustainable Use of Biodiversity in Stranca (Yildiz) / Mt Strandzha).

Threatened taxa

After preparing the check list, another important step was identification of the existing rare and threatened taxa. Evaluations of the listed endangered taxa have been made:

I. Endemic taxa to Turkey – Annex I (taxa occur only in Turkey).

II. Bern Species – Annex II (taxa listed in Appendix I of the Bern Convention).

"Turkey became a member of the convention on the Conservation of European Wild Life and Natural Habitats, usually known as the Bern Convention, on 20 February 1984. The Convention aims to ensure conservation of the wild flora and fauna and their natural habitats and to encourage cooperation between the Member States. There is an obligation for each contracting party to undertake appropriate and necessary legislative and administrative measures so as to ensure effective conservation of the strictly protected species. Appendix I of the Bern Convention lists plant species threatened in nature and regarded as priority species for conservation. The criteria used in identifying the conservation priority sites ensure that key populations of protected species – in this case the Bern Convention Appendix I species – should be selected".

III. Thracian taxa – Annex III (taxa occur only in European Turkey, the Balkans and Europe and not in the Asiatic part of Turkey).

Criteria for the core zones

1. Presence of rare species: the site holds significant populations of one or more species that are endemic, threatened or occur only in European Turkey (Turkish Thrace), or solely within the project area.

2. Presence of botanical diversity: the site has as exceptionally rich flora and some of the best populations of the species.

3. Presence of threatened habitats: the site is an outstanding example of some vegetation type of global and national threatened and botanical importance.

Abbreviations

ISTE: The Herbarium of the Faculty of Pharmacy, Istanbul University

EDTU: The Herbarium of the Faculty of Forestry, Istanbul University

Bern: The Turkish taxa of the Bern Convention Annex I

B: Balkan species

E: European species

End: Endemics

Annex I. Endemic species in the Yıldız Mountain (Kırklareli) Biosphere Project area.

1. *Allium rumelicum* M. Koçyiğit & N. Özhatay
2. *Anchusa leptophylla* Roemer & Schultes subsp. *incana* (Ledeb.) Chamb.
3. *Asperula littoralis* Sm.
4. *Ballota nigra* subsp. *anatolica* P.H. Davis
5. *Centaurea hermannii* F. Herm.
6. *C. kilaea* Boiss.
7. *Cirsium baytopae* P.H. Davis & Parris
8. *Erysimum sorgerae* Polatschek
9. *Euphorbia amygdoloides* var. *robbiae* (Turril) Radcl.-Sm.
10. *Isatis arenaria* Azn.
11. *Jurinea turcica* B. Doğan & A. Duran
12. *Linum tauricum* subsp. *bosphori* P.H. Davis
13. *Silene sangaria* Coode & Cullen
14. *Symphytum pseudobulbosum* Azn.
15. *Trifolium pannonicum* subsp. *elongatum* (Willd.) Zohary

Annex II. Bern species in the Yıldız Mountain (Kırklareli) Biosphere Project area.

1. *Aurinia uechtritziana* (Bornm.) Cullen & Dudley
2. *Centaurea hermannii* F. Herm. (end.)
3. *Cyclamen coum* Mill. var. *coum*
4. *Salvinia natans* (L.) All.
5. *Silene sangaria* Coode & Cullen (end.)
6. *Trapa natans* L.
7. *Vaccinium arctostaphyllos* L.
8. *Verbascum degenii* Halácsy (end.)
9. *V. purpureum*(Janka) Hub.-Mor.
10. *Veronica turrilliana* Stoj. & Stef.
11. *Teucrium lamiifolium* d'Urv.

Annex III. Rare species for Turkey that distributed in the Yıldız Mountain (Kırklareli) Biosphere Project area (taxa occur only in European Turkey, the Balkans and Europe and not in the Asiatic part of Turkey).

Acer pseudoplatanus L.
Achillea clypeolata Sm. (Balkan end.)
A. crithmifolia Waldst. & Kit.
Allium guttatum subsp. *dalmaticum* (A. Kern. ex Janch.) Stearn
A. saxatile M. Bieb.
Anemone nemorosa L.
A. ranunculoides L. subsp. *ranunculoides*
Anthoxanthum aristatum Boiss.
Armeria rumelica Boiss.
Aurinia uechtritziana (Bornm.) Cullen & Dudley
Berteroa obliqua (Sm.) DC.
Bupleurum praealtum L.
Campanula patula L. subsp. *patula*
C. rotundifolia L.
C. sparsa Friv.
Centaurea arenaria M. Bieb. ex Willd.
Cirsium candelabrum Griseb.
Dianthus campestris subsp. *pallidiflorus* (Ser.) Schmalh.
D. pinifolius Sm.
D. roseoluteus Velen
Digitalis grandiflora Miller
D. viridiflora Lindley (Balkan end.)
Ferulago confusa Velen.
Heptaptera triquetra (Vent.) Tutin
Hesperis macedonica Adamović
H. pycnotricha Borbás & Degen
H. tristis L.
Jurinea kilaea Azn. (Balkan end.)
Knautia drymeia Heuff.
K. macedonica Griseb.
Leontodon cichoraceus (Ten.) Sanguin.
Lychnis viscaria L.
Melampyrum pratense L.
Onosma thracicum Velen.
Paronychia cephalotes (M. Bieb.) Bess.
Peucedanum obtusifolium Sm. (Balkan end.)
Pseudolysimachion orchideum (Crantz) Wraber
Pulmonaria obscura Dumort.
Rorippa thracica (Gris.) Fritsch
Salvia nutans L.
Satureja coerulea Janka
Saxifraga adscendens L. subsp. *parnassica* (Boiss. & Heldr.) Hayek
Scabiosa triniifolia Friv. (Balkan end.)
Secale sylvestre Host.
Senecio papposus (Rchb.) Less. subsp. *papposus*
Sideritis scardica Griseb. subsp. *scardica* (Balkan end.)
Taraxacum gracilens Dahlst.
Thlaspi praecox Wulf. subsp. *praecox*
Trifolium bocconei Savi
Verbascum banaticum Schrad.
V. bugulifolium Lam.
V. degenii Halászcy. (Balkan end.)
V. purpureum (Janka) Hub.-Mor. (Balkan end.)
Veronica crinita Kit. ex Schult. (=*V. austriaca* subsp. *teucrium* (L.) D.A. Webb)
V. turilliana Stoj. & Stef. (Balkan end.)

Results

Flora of the Project area

Vascular flora (flowering plants & ferns) within the Project and the adjacent area comprises 1364 taxa with rare and threatened status (Fig. 2 and Table 1).

Four conservation priority sites and 14 core zones have been previously determined in eleven hotspots (Fig. 1); threats and recommendations have been given in a Sites Identification Card for each core zone after short description of the area. Each chart provides location and map details; size and altitude; threats, threatened species and habitats; and the protection status of the core zone.

Eighteen taxa belonged to *Pteridophyta*, the remaining 1346 taxa were *Spermatophyta*, including four taxa of *Gymnospermae*, 1076 taxa of *Dicotyledonae* and 266 taxa of *Monocotyledonae*. The largest families in terms of the number of genera were *Compositae* (57 genera), *Graminae* (48 genera) and *Umbelliferae* (33 genera). The richest families in terms of the number of taxa at species, subspecies and varieties level were *Compositae* (160 taxa), *Leguminosae* (123 taxa) and *Graminae* (107 taxa). The richest genera in terms of the number of taxa at species, subspecies and varieties level were *Trifolium* (64 taxa), *Vicia* (36 taxa), *Allium* (24 taxa), *Euphorbia* and *Carex* (23 taxa).

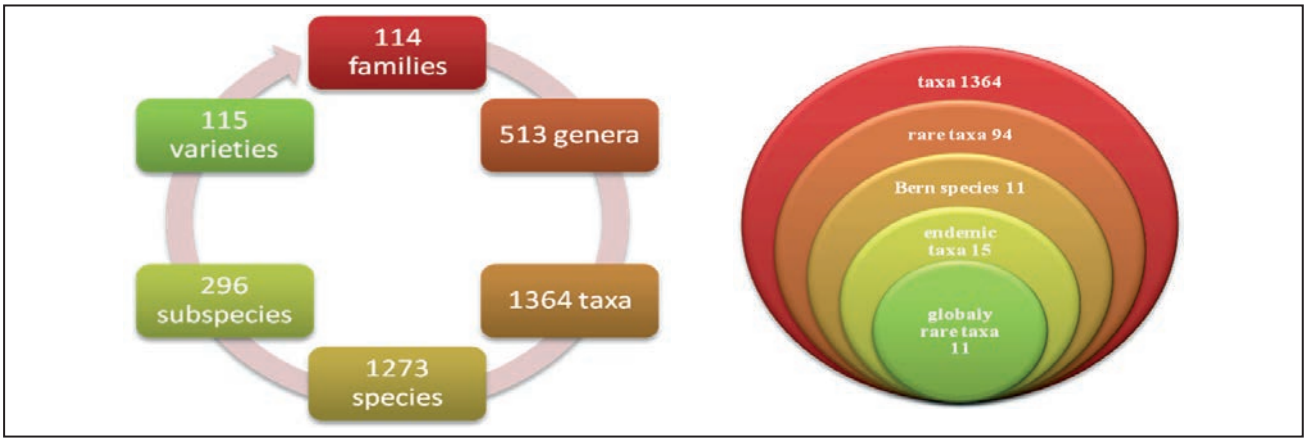

Fig. 2. A summary of the Project area flora with rarity and threatened status.

Table 1. Vascular plant species with Threatened status (CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; Global = Endemic, CR or EN, and Bern listed; Europe = VU and Bern listed; Turkey = occurs only in European Turkey and considered to be at risk).

				IUCN Red List of Threatened Species					Threatened			New records			
Total taxa	Endemic to Turkey	Thracian species	Bern Convention	CR	EN	VU	NT	LC	Global	Europe	Turkey	Yildiz	European Turkey	Turkey	New species
1364	15	55	11	4	13	49	1	10	11	7	94	345	8	3	2

Four conservation priority sites cited below and 14 core zones have been determined in eleven hotspots; threats and recommendations have been given in a Sites Identification Card for each core zone after short description of the area. Each chart provides location and map details; size and altitude; threats, threatened species and habitats; and the protection status of the core zone.

Priority sites (I–IV) and core zones (Fig. 3)

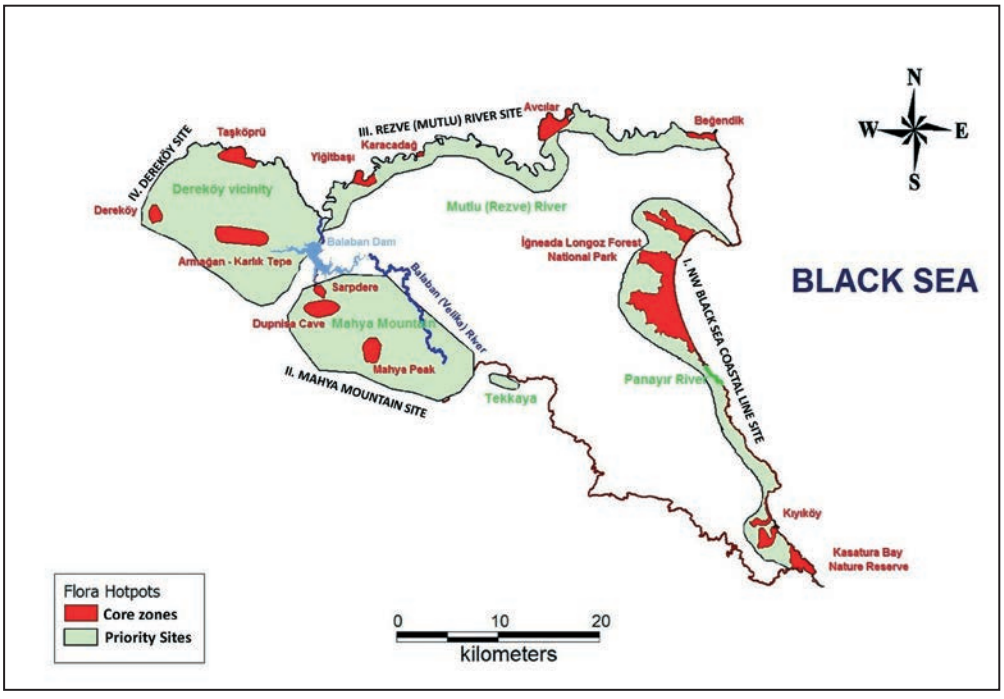

Fig. 3. Core zones and Conservation Priority Sites of the proposed Yildiz Mountain Biosphere Reserve.

I. NW BLACK SEA COASTLINE (4 CORE ZONES)
1. İğneada Longoz Forest; 2. Kasatura Bay Nature Reserve; 3. Panayır River; 4. Kıyıköy Coast.

I.1. İğneada Longoz Forest located at the Black Sea Coast, lies 12 km south of the Bulgarian border. The core zone, including many different ecosystems, exhibits rich diversity. Some of these ecosystems are floodplain forests (locally known as 'longoz' forests), thermophilous forests, different types of swamps, lakes and sand-dunes, appearing not only near the sea but also along rivers. Each of these ecosystems with specific plant diversity has further contributed to the rich vegetation diversity of the region.

I.1. CORE ZONE: İğneada Longoz Forest

Coordinates: 41° 51' N 27° 57' E
NG 8133

Size: 5757 ha
Altitude: 100 m
Taxa number: 472
Threats: The northwest highway, which is under development and will reach the Bulgarian Border, is potentially a threat for the diversity of the sand-dunes. Watershed management activities supplying water to İstanbul also threaten the floodplain forests and other wetlands in the region. Additional theats are construction of summer houses, sand removal, intensive and irregular grazing and increasing touristic activities.

Globally threatened (Endemic taxa): **5** (*Anchusa leptophylla* subsp. *incana*, *Ballota nigra* subsp. *anatolica, Centaurea kilaea*, *Silene sangaria*, *Trifolium pannonicum* subsp. *elongatum*).
Threatened taxa of European Concern (Bern & Balkan Species): 8 [*Aurinia uechtritziana*, *Cylamen coum* var. *coum, Salvinia natans*, *Trapa natans, Verbascum degenii* (Bern Convention Appendix 1), *Ferulago confusa, Jurinea kilaea, Peucedanum obtusifolium* (Balkan taxa)].
Rare species for Turkey: 4 (*Centaurea arenaria*, *Logfia minima*, *Secale sylvestre, Trifolium bocconei*).
Endangered rare habitats: 16.2113; 16.2124; 16.22B11; 22.412; 22.415; 41.47; 41. 7371; 41.76A1; 41.76A12; 41. 76A4; 44.4322.
Protection status: National Park; Permanent Wildlife Reserve Area; Strict Reserve Area; Natural Heritage Area; Important Bird Area; Important Plant Area (IPA 5)

I.2. Kasatura Bay Nature Reserve, the Kasatura Gulf core zone is located at the Black Sea coast, southwards of Kıyıköy (Vize). In the area, there are forests composed of various trees, longoz forests, sand dunes, maquis, black pine and oak forests. The place is important since there are various habitats and thriving plant diversity in the field, along with the plant species which are under protection of international conventions.

I.2. CORE ZONE: Kasatura Bay Nature Reserve

Coordinates: 41° 46' N 28° 01' E

Size: 0,1 ha / 13000 m^2
Altitude: *ca* 150 m
Taxa number: 365
Threats: The summer houses constructed in the north of the area threaten the core zone. Seaside and other natural habitats in core zone are endangered because of recreational activities. The other threat for the core zone is grazing, that takes place in the north of the area. The Sultanbahçe Dam, the building up of the Bahçıvan stream, changes the area and the flow of the stream. This situation will also cause a change in the longoz forest area over time.

Globally threatened (Endemic taxa): 5 (*Ballota nigra* subsp. *anatolica, Centaurea hermannii, Centaurea kilaea*, *Linum tauricum* subsp. *bosphori, Silene sangaria*).
Threatened taxa of European Concern (Bern & Balkan Species): 8 [*Aurinia uechtritziana*, *Centaurea hermannii, Cyclamen coum* var. *coum*, *Veronica turrilliana* (Bern Convention Appendix 1); *Jurinea kilaea, Peucedanum obtusifolium*, *Verbascum banaticum, Verbascum bugulifolium* (Balkan taxa)].
Rare species for Turkey: 7 (*Acer pseudoplatanus, Anemone blanda, Crocus olivieri* subsp. *olivieri, Crocus chrysanthus, Helianthemum aegyptiacum, Lilium martagon, Tilia cordata*).
Endangered rare habitats: 16.2113; 16.2124; 16.22B11; 31.22C; 41.1E122; 41.7371; 41.76A1; 41.76A12; 41.76A4; 41.76A5; 41.H21; 41.H21; 42.66; 44.432
Protection status: Some parts of the Kasatura Gulf core zone are Nature Reserve Area and Important Plant Area (IPA-6).

I.3. Panayır River – Panayır River Dunes situated at the Black Sea coast cover a 20 km stretch of coastal dunelands, extending up to 1 km inland. The site comprises one of the least disturbed stretches of dunes remaining in Thrace, extending between İğneada and Kıyıköy core zones. Further spread of the dunes is stopped by the river and *Quercus*-dominated acid coppice forests.

I.3. CORE ZONE: Panayır River

Coordinates: 41° 36' N 28° 36' E

Size: approx 2000 ha (only 0,1 ha sandy shore)
Altitude:100 m
Taxa number: *approx.* 100
Threats: The principal threat to this site is the large number of campers and summer visitors using the beach during the summer months. Within this area litter is a major problem; grazing intensity too.

Globally threatened (Endemic taxa): 2 (*Centaurea kilaea*, *Silene sangaria*).
Threatened taxa of European Concern (Bern & Balkan Species): 3 [*Ferulago confusa, Jurinea kilaea*, *Peucedanum obtusifolium* (Balkan)].
Rare species for Turkey:
Endangered rare habitats: 16.2113; 16.2124; 16.22B11.
Protection status: The site does not have any conservation status.

I.4. Kıyıköy Coast comprises a block of sand dunes originally occupying an area of approximately 2 km by 2 km, lying on the Black Sea coast near the village of Kıyıköy (Midye) .The dunes rise relatively rapidly to a height of 90 m (where they are blown up to the adjacent hills), and were bordered historically by an *Erica manipuliflora* dry heath, *Arbutus unedo-Erica arborea* tall heath, *Quercus*-dominated coppice forests, and agricultural grazing lands.

I.4. CORE ZONE: Kıyıköy Coasts

Coordinates: 41° 37' N 28° 05' E; 41° 37' N 28° 06' E

Size: 6.3 ha / 63.000 m^2
Altitude: 100 m
Taxa number: 152
Threats: A considerable proportion of these adjacent vegetation types have been destroyed or grossly altered in the past few decades.

Globally threatened (Endemic taxa): 6 (*Asperula littoralis, Centaurea kilaea, Cirsium baytopae, Erysimum sorgarae, Isatis arenaria, Silene sangaria*).
Threatened taxa of European Concern (Bern & Balkan Species): 7 [*Aurinia uechtritziana*, *Cylamen coum* var. *coum, Salvinia natans*, *Trapa natans, Verbascum degenii* (Bern) *Ferulago confusa, Jurinea kilaea* (Balkan)].
Rare species for Turkey: 1 (*Saxifraga adscendens* subsp. *parnassica*).
Endangered rare habitats: 16.2113; 16.2124; 16.22B11
Protection status: The site does not have any conservation status.

II. MAHYA MOUNTAIN (3 CORE ZONES)
1. Dupnisa Cave; 2. Sarpdere; 3. Mahya Peak.

II.1. Dupnisa Cave is located to the west of Mt Yildiz and to the north of the Mahya Mountains. The area is covered with oak forests, other broadleaved forest trees and bushes, calcareous rocks that are lying in the forest openings, and numerous humid and arid herbaceous species [grasslands]. Calcareous rocks in the forest openings have attracted particular attention because of the richness of various herbaceous species there.

II.1. CORE ZONE: Dupnisa Cave

Coordinates: 41° 49' N 27° 32' E, 41° 50' N 27° 34' E

Size: *approx. 2* km^2
Altitude: 250–350 m
Taxa number: 133
Threats: *Sideritis scardica* subsp *scardica* is exposed to extensive collecting activities. Other threats include inappropriate reforestation and grazing activities.

Globally threatened (Endemic taxa): 1 (*Allium rumelicum*).
Threatened taxa of European Concern (Bern & Balkan Species): 6 [*Cyclamen coum* var. *coum* (Bern) *Achillea clypeolata*, *Ferulago confusa, Satureja coerulea*, *Scabiosa triniifolia*, *Sideritis scardica* subsp. *scardica* (Balkan)].
Rare species for Turkey: 1 (*Allium saxatile*).
Endangered rare habitats: 34.311; 34.532; 38.252; 41.76A1.
Protection status: The site does not have any conservation status. Only Dupnisa Cave, which is managed by the Kirklareli Governorship Special Provincial Administration, is open to visitors during some periods of the year.

II.2. Sarpdere is related to Dupnisa Cave as habitat and floristic composition. Forest openings and bare rocky hills are important areas in terms of rare species. In particular, there are various humid and arid herbaceous species (grasslands) overlying the calcareous rocks located in the Sarpdere core zone. A new species to Turkey: *Allium saxatile* M. Bieb., three new taxa to Thrace: *Arabis turrita* L., *Dianthus carthusianorum* L. and *Pimpinella tragium* subsp. *lithophila* (Schin.) Tutin, and many important taxa have been found in the area.

II.2. CORE ZONE: Sarpdere

Coordinates: 41° 51' N 27° 32' E, 41° 50' N 27° 31' E

Size: *approx.* 8 km^2
Altitude: 225–580 m
Taxa number: 150
Threats: *Sideritis scardica* subsp *scardica* is exposed to extensive collecting activities. Other threats include inappropriate reforestation and grazing activities.

Globally threatened (Endemic taxa): –
Threatened taxa of European Concern (Bern & Balkan Species): 6 [*Cyclamen coum* var. *coum*, *Veronica turrilliana* (Bern) *Achillea clypeolata*, *Ferulago confusa, Hesperis macedonica*, *Hesperis pycnotricha*, *Onosma thracica*, *Rorippa thracica*, *Satureja coerulea*, *Sideritis scardica* subsp. *scardica* (Balkan)].
Rare species for Turkey: 2 (*Allium saxatile, Anemone ranunculoides*).
Endangered rare habitats: 34.311; 34.532; 38.252.
Protection status: The site does not have any conservation status.

II.3. Mahya Peak is the highest peak (1,031 m) of Mt Yildiz and also in European Turkey. Beech forests occupy the higher altitudes and the lower zones support oak, beech or hornbeam/beech mixed forests. Rhododendrons (*Rhododendron ponticum)* can be found in the understory layer. Small areas of scrub and grass pasture occur within the forest clearings.

II.3. CORE ZONE: Mahya Peak

Coordinates: 41° 52' N 27° 34' E, 41° 46' N 27° 33' E

Size: *approx.* 13,8 km^2
Altitude: 700–1035 m
Taxa number: 367
Threats: The most important threats, particularly in the southern parts, are incorrect reforestation, grazing and extensive collection of rare species.

Globally threatened (Endemic taxa): 1 (*Euphorbia amygdoloides* var. *Robbiae*).
Threatened taxa of European Concern (Bern & Balkan Species): 11 [*Cyclamen coum* var. *coum*, *Vaccinium arctostophyllos, Verbascum purpureum* (Bern), *Achillea crithmifolia*, *Berteroa obliqua*, *Campanula sparsa*, *Digitalis viridiflora*, *Ferulago confusa, Lychnis viscaria*, *Rorippa thracica*, *Scabiosa triniifolia* (Balkan)].
Rare species for Turkey: 2 (*Anthoxanthum aristatum*, *Berteroa obliqua*, *Bupleurum praealtum*, *Campanula patula* subsp. *patula*, *Knautia drymeia*).
Endangered rare habitats: 41.76A42; 41.H1111; 41.H1112.
Protection status: The site does not have any conservation status.

III. REZVE (MUTLU) RIVER (4 CORE ZONES)
1. Yiğitbaşı; 2. Karacadağ; 3. Avcılar; 4. Beğendik.

III.1. Yiğitbaşı lies further upstream the Mutlu (Rezovska) River, along the Bulgarian border, and is characterised by beech and oak forests.

III.1. CORE ZONE: Yiğitbaşı

Coordinates: 41° 55' N 27° 35' E, 41° 56' N 27° 36' E, 41° 56' N 27° 37' E

Size: *approx.* 10 km^2
Altitude: 250–390 m
Taxa number: 80
Threats: Invasive species, tree cutting

Globally threatened (Endemic taxa): 1 (*Anchusa leptophylla* subsp. *incana*).
Threatened taxa of European Concern (Bern & Balkan Species): 2 [*Cyclamen coum* var. *coum* (Bern), *Digitalis viridiflora* (Balkan)].
Rare species for Turkey: 3 (*Knautia drymeia*, *Lilium martagon*, *Teucrium lamiifolium* subsp. *lamiifolium*).
Endangered rare habitats: 22.3233; 22.351; 41.1E122; 41.2C; 41.76A; 41.H1111; 41.H1112; 41.H21.
Protection status: The site does not have any conservation status. Nevertheless, a 2 km corridor benefits from being located within a first degree military zone along the Bulgarian border, to which access is forbidden.

III.2. Karacadağ lies further upstream the Mutlu (Rezovska) River, near to Yiğitbaşı, along the Bulgarian border and is characterised by beech and oak forests.

III.2. CORE ZONE: Karacadağ

Coordinates: 41° 57' N 27° 40' E, 41° 58' N 27° 41' E

Size: *approx.* 5 km^2
Altitude: 160–250 m
Taxa number: 105
Threats:

Globally threatened (Endemic taxa): –
Threatened taxa of European Concern (Bern & Balkan Species): 3 [*Cyclamen coum* var. *Coum* (Bern), *Digitalis viridiflora, Rorippa thracica* (Balkan)].
Rare species for Turkey: 3 (*Knautia drymeia*, *Lilium martagon*, *Teucrium lamiifolium* subsp. *lamiifolium*).
Endangered rare habitats: 22.3233; 22.351; 41.1E122; 41.2C; 41.76A; 41.H1111; 41.H1112; 41.H21.
Protection status: The site does not have any conservation status. Nevertheless, a 2 km corridor benefits from being located within a first degree military zone along the Bulgarian border to which access is forbidden.

III.3. Avcılar lies in the middle of the priority site; that part of the Mutlu River valley along the Bulgarian border is covered mostly by oak forest, with patches of beech and hornbeam.

III.3. CORE ZONE: Avcılar
Coordinates: 41° 58' N 27° 49' E, 41° 59' N 27° 49' E, 42° 00' N 27° 51' E, 41° 59' N 27° 51' E
Size: *aprox.*. 12 km^2
Altitude: 39–180 m
Taxa number: 59
Threats: Dam and pipeline construction, the huge highway project. The transformation of dry brushwood and river terraces to agricultural land or poplar plantations. Spread of invasive species. Illegal tree felling.

Globally threatened (Endemic taxa): –
Threatened taxa of European Concern (Bern & Balkan Species): 1 [*Cyclamen coum* var. *coum* (Bern)].
Rare species for Turkey: 2 (*Acer pseudoplatanus*, *Knautia drymeia*).
Endangered rare habitats: 22.3233; 22.351; 24.2; 31.22C; 41.2C; 41.76A; 41.H1111; 41.H21
Protection status: The site does not have any conservation status. Nevertheless, a 2 km corridor benefits from being located within a first degree military zone along the Bulgarian border to which access is forbidden.

III.4. Beğendik lies alongside the estuary of the Mutlu River into the Black Sea, along the Bulgarian border. The vegetation is primarily oak forest, with some lime and hornbeam. Ash longoz forest dominates along the river banks.

III. 4. CORE ZONE: Beğendik
Coordinates: 41° 58' N 27° 59' E, 41° 58' N 28° 01' E
Size: *approx*. 10 km^2
Altitude: 0–80 m
Taxa number: 76
Threats: Dam and pipeline construction. The huge highway project. The transformation of dry brushwood and river terraces to agricultural land or poplar plantations. Invasive species. Illegal tree felling, heavy levels of grazing.

Globally threatened (Endemic taxa): –
Threatened taxa of European Concern (Bern & Balkan Species): 4 [*Cyclamen coum* var. *coum***,**(Bern)*, Cardamine penzesii*, *Centaurea kilaea, Rorippa thracica* (Balkan)].
Rare species for Turkey:
Endangered rare habitats: 16.2113; 16.22B11; 22.3233; 22.351; 24.2; 31.22C; 41.2C; 41.76A; 41.H21; 44.4322.
Protection status: The site does not have any conservation status. Nevertheless, a 2 km corridor benefits from being located within a first degree military zone along the Bulgarian border to which access is forbidden.

IV. DEREKÖY (3 CORE ZONES)
1. Dereköy; 2. Taşköprü;3. Armağan-Karlık Hill.

IV.1. Dereköy lies in the higher parts of Mt Yildiz and comprises mainly oak and hornbeam forests.

IV.1. CORE ZONE: Dereköy
Coordinates: 41° 54' N 27° 21' E, 41° 54' N 27° 22' E, 41° 55' N 27° 21' E
Size: *approx*. 6 km^2
Altitude: 450–520 m
Taxa number: 94
Threats: Invasive species, tree cutting, stone quarries, grazing

Globally threatened (Endemic taxa): 2 (*Anchusa leptophylla* subsp. *incana***,** *Trifolium pannonicum* subsp. *elongatum*).
Threatened taxa of European Concern (Bern & Balkan Species): 3 [*Cyclamen coum* var. *coum* (Bern), *Digitalis viridiflora, Ferulago confusa* (Balkan)].
Rare species for Turkey: 8 (*Acer pseudoplatanus*, *Armeria cariensis* var. *rumelica*, *Aster tripolium*, *Digitalis grandiflora*, *Knautia drymeia*, *Ophrys oestrifera* subsp. *oestrifera*, *Teucrium lamiifolium* subsp.*lamiifolium*, *Trifolium heldreichianum*).
Endangered rare habitats: 22.351; 24.2; 41.2C; 41.76A; 41.H21
Protection status: The area does not have any conservation status.

IV.2. Taşköprü is located along the Turkish-Bulgarian border in the highest part of Mt Yıldız. It is mostly covered by beech and beech-oak forests.

IV.2. CORE ZONE: Taşköprü

Coordinates: 41° 56' N 27° 25' E, 41° 58' N 27° 25' E, 41° 57' N 27° 29' E, 41° 56' N 27° 29' E

Size: *approx*. 17 km^2
Altitude: 500–717 m
Taxa number: 176
Threats: Invasive species, tree cutting

Globally threatened (Endemic taxa): 3 (*Cirsium baytopae*, *Euphorbia amygdoloides* var. *robbiae*, *Symphytum pseudobulbosum*)
Threatened taxa of European Concern (Bern & Balkan Species): 4 [*Cyclamen coum* var. *coum* (Bern), *Digitalis viridiflora, Ferulago confusa, Rorippa thracica* (Balkan)].
Rare species for Turkey: 8 (*Acer pseudoplatanus*, *Carex brizoides*, *Doronicum orientale*, *Galium uligunosum*, *Hypericum hirsutum*, *Knautia drymeia*, *Orchis papilionacea* var. *papilionacea*, *Viola canina*).
Endangered rare habitats: 22.351; 24.2; 41.1E122; 41.2C; 41.H1111; 41.H1112.
Protection status: The site does not have any conservation status. Nevertheless, a 2 km corridor benefits from being located within a first degree military zone along the Bulgarian border to which access is forbidden.

IV.3. Armağan-Karlık Hill lies south of Dereköy, in the higher parts of Mt Yildiz. Oak forests occur around Armağan, beech-oak-lime along the Karlık Hill route, and open rocky areas at the Karlık Hill.

IV.3. CORE ZONE: Armağan-Karlık Hill

Coordinates: 41° 52' N 27° 24' E, 41° 53' N 27° 24' E, 41° 53' N 27° 30' E, 41° 52' N 27° 30' E

Size: *approx*. 20 km^2
Altitude: 400–615 m
Taxa number: 190
Threats: Tree cutting, grazing

Globally threatened (Endemic taxa): 3 (*Anchusa leptophylla* subsp. *incana*, *Euphorbia amygdoloides* var. *robbiae*, *Symphytum pseudobulbosum*).
Threatened taxa of European Concern (Bern & Balkan Species): 6 [*Cyclamen coum* var. *coum*, (Bern) *Achillea clypeolata*, *Digitalis viridiflora*, *Ferulago confusa, Rorippa thracica*, *Sideritis scardica* subsp. *scardica* (Balkan)].
Rare species for Turkey: 10 (*Acer pseudoplatanus*, *Dianthus pinifolius*, *Erysimum diffusum*, *Hypericum hirsutum*, *Matthiola fruticulosa*, *Knautia drymeia*, *Trifolium bocconei*, *T. latinum*, *T. heldreichianum*, *Teucrium scordium* subsp. *scordioides*, *Veronica crinita*).
Endangered rare habitats: 22.351; 24.2; 41.2C; 41.76A; 41.H1111; 41.H21.
Protection status: The site does not have any conservation status.

Discussion

According to the UNESCO Man and the Biosphere (MAB) Programme concept, floristically-rich core areas were determined judging by the rare and threatened species, botanical diversity, and threatened habitat characteristics as indicators of floristic quality (Table 2). The 14 core zones have been grouped into four Conservation Priority Sites (Fig. 3).

İğneada is a very important centre of plant diversity and was designated as a National Park in 2007. This area must be protected. This core zone is a hydrologically important watershed that sustains some unique floodplain (longoz) forests and associated natural lakes.

The coastline and sand dune habitats support the highest diversity of rare and endemic species. They must, therefore, be effectively protected by law. There are some existing legal provisions to protect the sand dunes (Coastal Law of 1990) but these are not properly enforced. The coastline starts near the border of Bulgaria and extends to Kasatura, near the border of Tekirdağ Province.

Kasatura features among the most important areas of sand dune vegetation. Protection of these dunes is politically divided, with a small part belonging to Kırklareli Province and the main section belonging to Tekirdağ Province. It is recommended that the whole coast is placed under protection. Even the small part of sand dunes belonging to Kirklareli Province sup-

ports a wide range of rare species and can be used for educational field trips.

Furthermore, the coastal areas support the highest diversity of bird species, because of their swamp forests, coastal forests, estuaries, sand dunes, reed beds and meadows.

Particularly important are the sand dunes at Kasatura and Kıyıköy, which are threatened by the high levels of inappropriate visitor use.

Dupnisa Cave core zone, which features an old deciduous forest and open areas of calcareous rock outcrops, is another important area of floristic diversity. Furthermore, Dupnisa is one of the most important underground cave systems in the region, holding the largest colony of hibernating bats.

Current use of herbicides at roadside verges is potentially a serious threat to several species that populate the temporary ponds of the waysides. These include *Verbascum purpureum* (protected under the Bern Convention), *Cirsium candelabrum* (the only known locality for this species in the region) and *Cardamine penzesii (*considered a Balkan and Northwestern Black Sea endemic that occurs along the edge of the Çukurpınar-Üsküp motorway).

Alien invasive species, such as *Robinia pseudoacacia* (Black Locust) and *Galinsoga parviflora*, have infiltrated deep into the forest, where they may outcompete the local species.

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