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Plant and Habitats diversity in Greece: the case study of Mt Parnon

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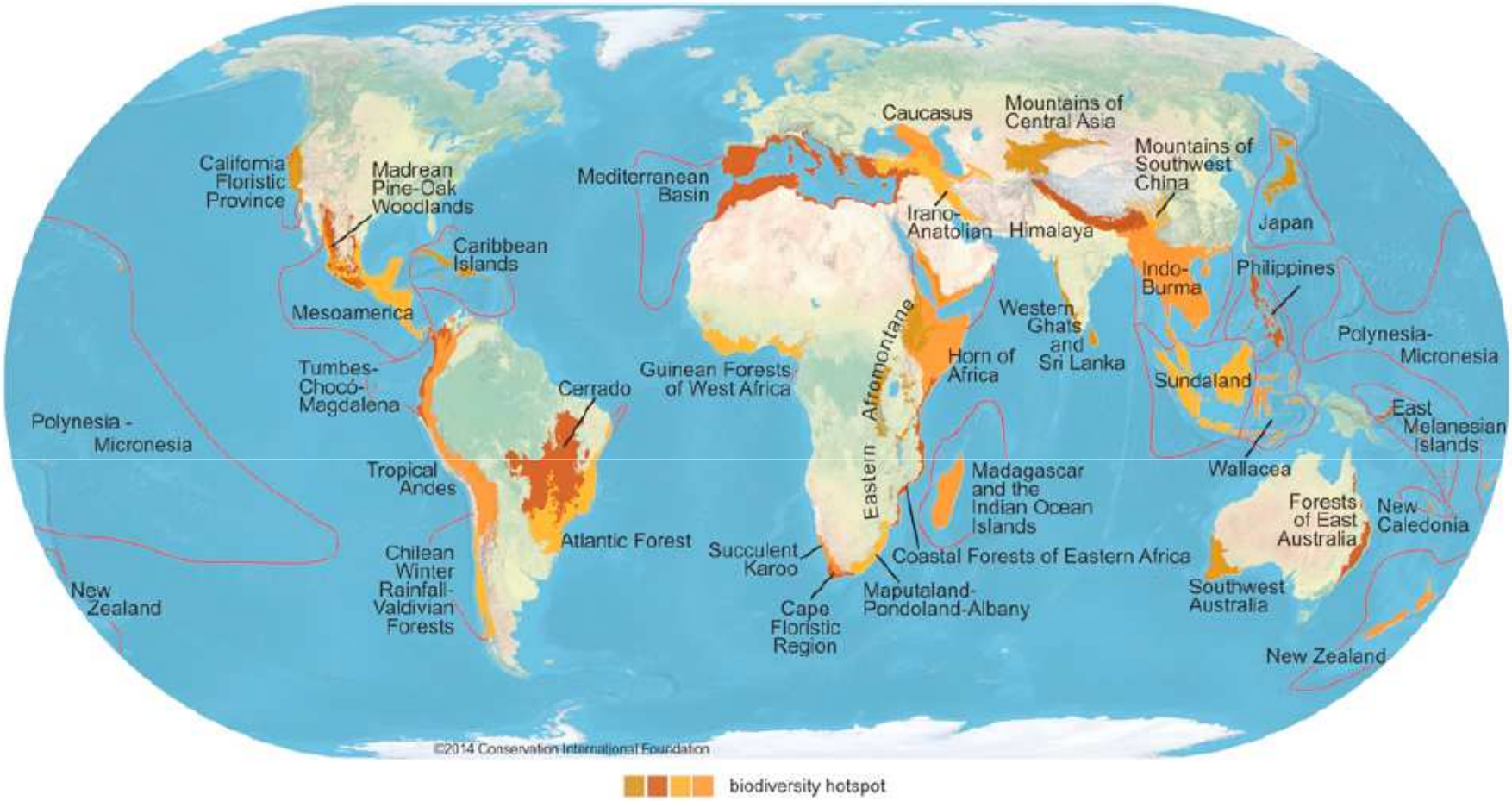
Content

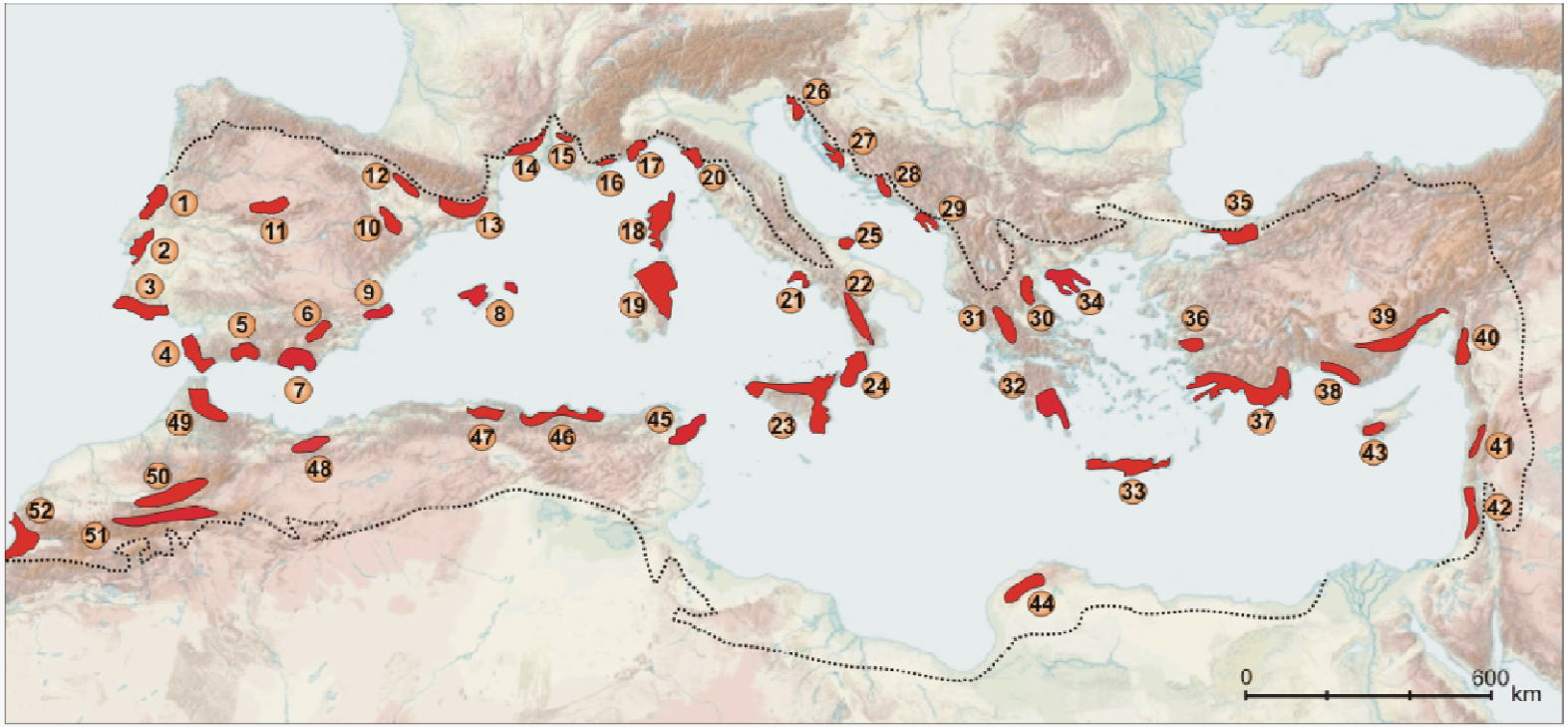
- Global scale biodiversity
- Mediterranean scale biodiversity
- Plants and habitats diversity in Greece
- The ecological value of Parnon as a biodiversity hot spot of Southern Greece is documented in relation to conservation efforts and measures undertaken.
- Ecosystem Services actually and potentially supplied by the various ecosystem types of Parnon are examined in the perspective of sustainable use of its natural resources and human well-being.

The world's biodiversity hotspots



35 biodiversity hotspots that cover only 17.3% of the Earth's land surface are characterized by both exceptional biodiversity and considerable habitat loss. More precisely, hotspots maintain 77% of all endemic plant species, 43% of vertebrates (including 60% of threatened mammals and birds), and 80% of all threatened amphibians (Mittermeier et al. 2011; Williams et al. 2011).

The 52 major refugia of Mediterranean plants



1 Beira litoral
2 Estramadura
3 Algarve
4 Cadiz/Algeciras region
5 Serrania de Ronda
6 Sierra Cazorla/Segura
7 Sierra Nevada/Gata
8 Balearic islands
9 Valencia region
10 Ebro valley
11 Sistema central
12 S. Pyrenees
13 S.E. Pyrenees
14 S. Cévennes
15 Mont Ventoux
16 E. Provence
17 Maritime Alps
18 Corsica
19 Sardinia
20 Alpi Apuani
21 Campania
22 S. Apennines
23 Sicilia
24 S. Calabria
25 Gargano
26 N. Istria
27 Velebit mountains
28 S. Bosnia/Biokovo
29 Montenegro
30 Olympe/Katalympos
31 C. Greece (Pindos)
32 Peloponnese
33 Crete
34 Chalkidiki peninsula
35 Izmit region
36 Boz/Aydin dag
37 S.W. Anatolia
38 C. Taurus
39 E. Taurus
40 Amanus
41 Lebanon range
42 Israel/Palestine
43 Cyprus
44 Cyrenaic (Lybia)
45 J. Zaghouan/Cap Bon
46 Petite Kabylie/de Collo
47 Grande Kabylie
48 Tlemcen mountains
49 Rif mountains
50 Middle Atlas
51 High Atlas
52 Souss/W. Anti-Atlas

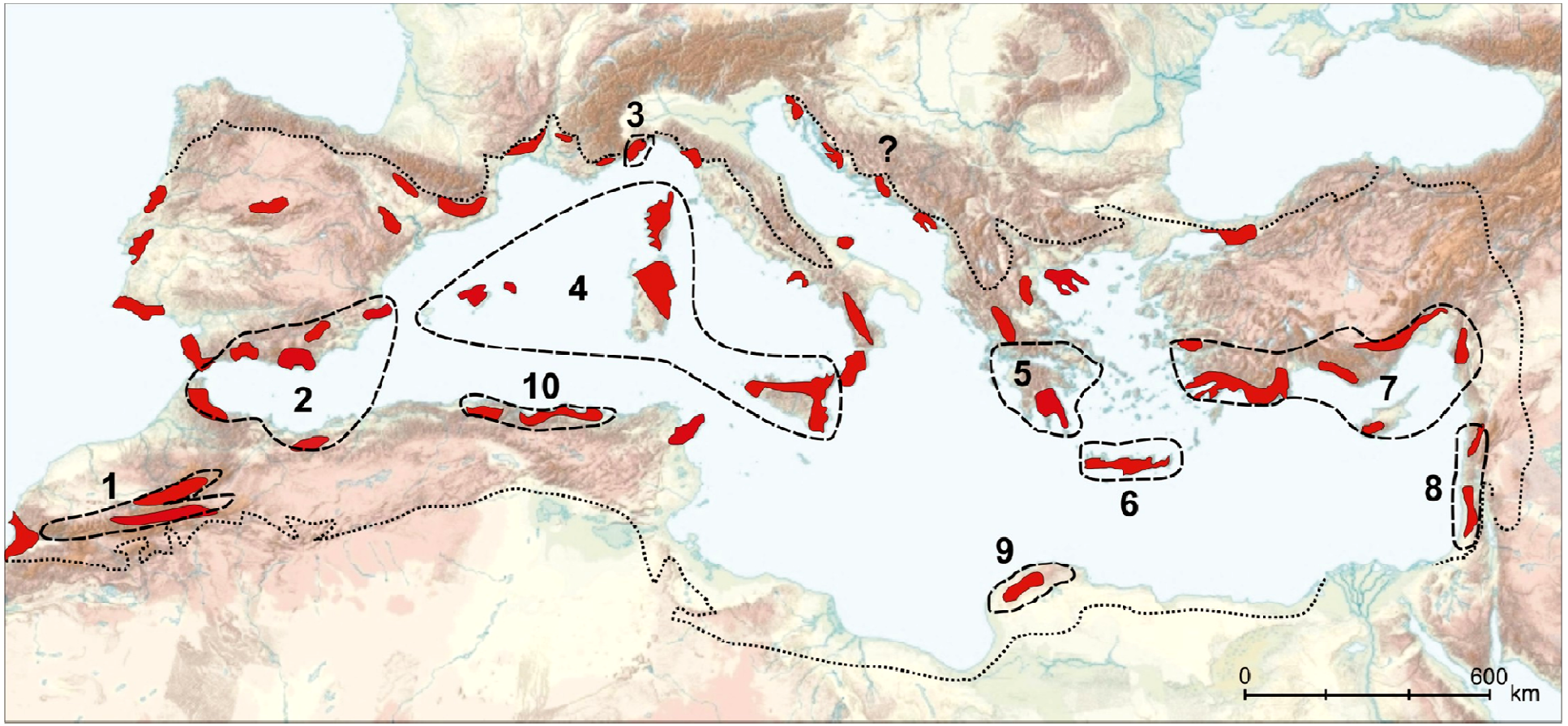
Médail F. & Diadema K., 2009. *Journal of Biogeography*, in press.

The 52 major refugia of Mediterranean plants

- **Refugia represent climatically stable areas and constitute a high conservation priority,** as key areas for the long-term persistence of species and genetic diversity, especially given the threat posed by the extensive environmental change processes operating in the Mediterranean region.

- The locations of refugia are determined by complex historical and environmental factors, the cumulative effects of which need to be considered because they have occurred since the Tertiary, rather than solely during the last glacial period.

The significant congruence between refugia and hotspots



Significant over-representation of refugia within regional biodiversity hotspots

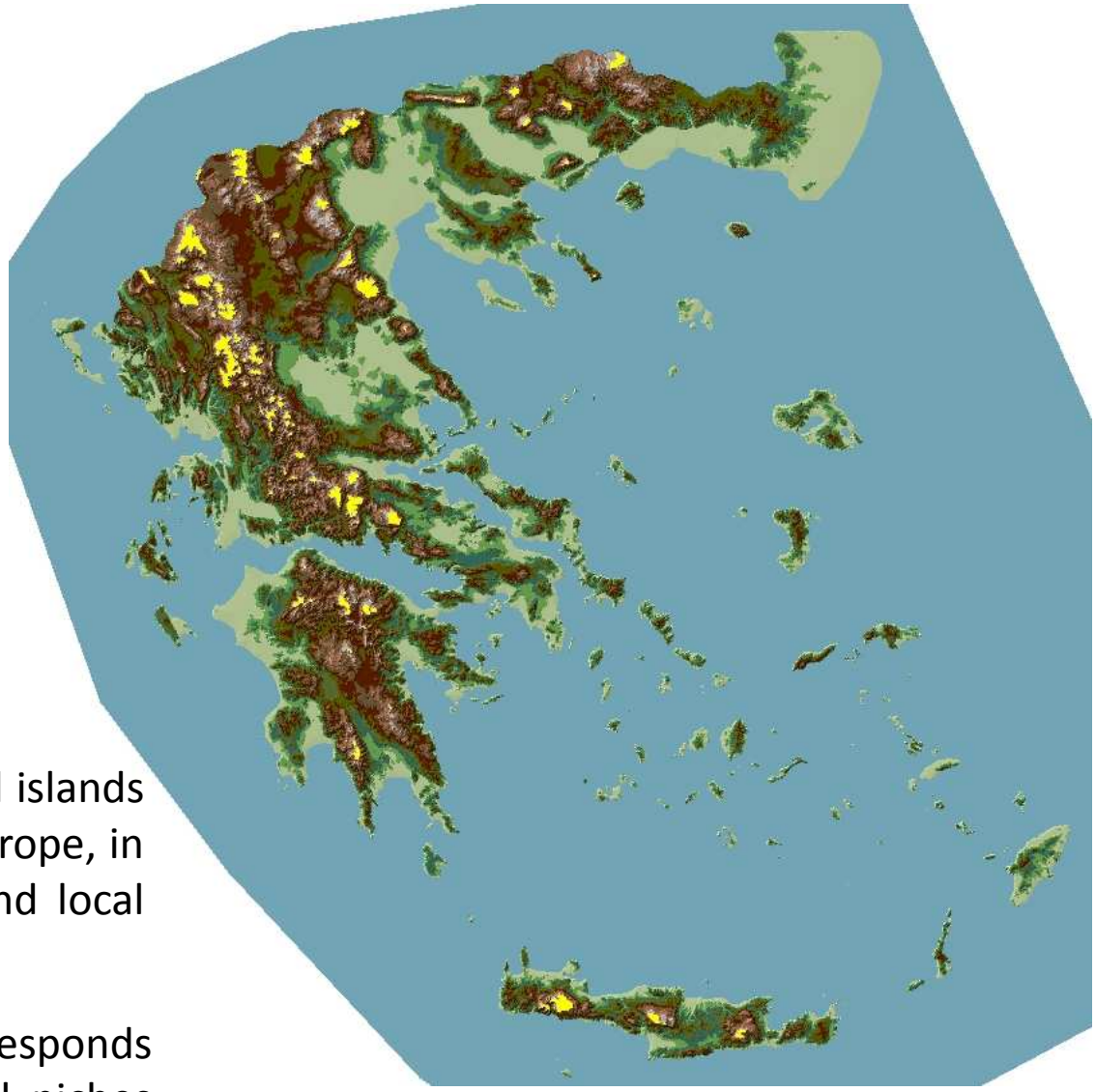
Half of the 52 refugia are included in the 10 Mediterranean hotspots

(chi-2 = 29.26; d.f. = 1; $P < 0.001$).

Médail F. & Diadema K., 2009. *Journal of Biogeography*, in press.

Greece is

- One of the most insular territories at global level (> 8000 islets and islands).
- Characterized by strong topographic and environmental heterogeneity (314 mountains, 1.674 peaks higher than 1000 m), complex geological and palaeo-geographic history, and has the largest coast of Europe (16.000 km).



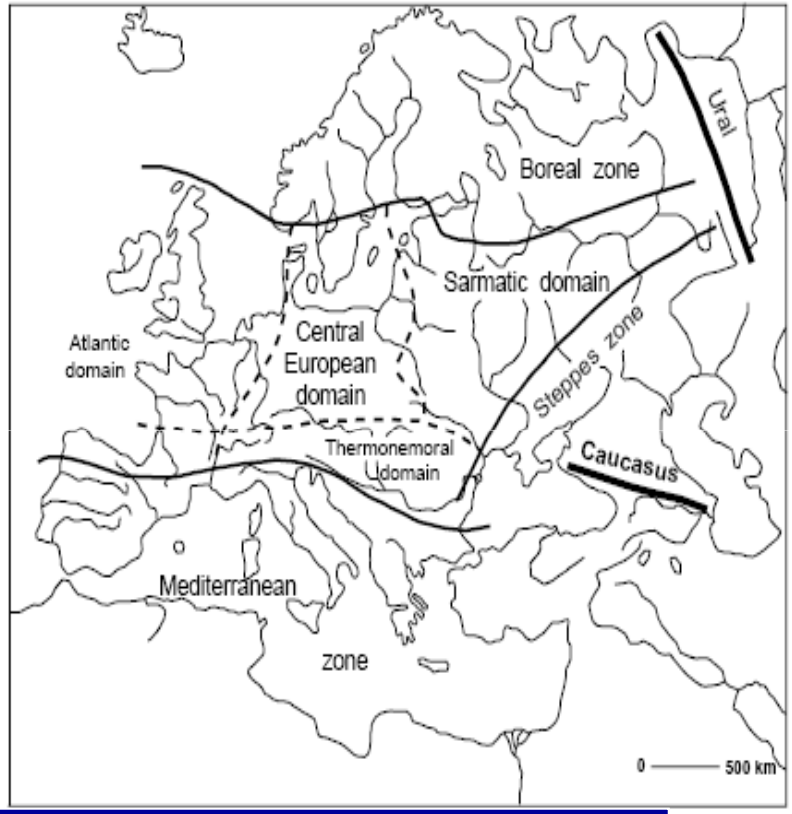
Greece, is a country of mountains and islands and has one of the richest floras in Europe, in particular with respect to regional and local endemics

The increased habitat diversity corresponds to increased availability of ecological niches to allow speciation of new species including new endemic species

Greece – it's position for species diversity

- Greece is phytogeographically a borderline and a crossroads, an eastern Mediterranean and a Balkan country, the south-easternmost edge of Europe in immediate contact with South-West Asia and close contact with North Africa.

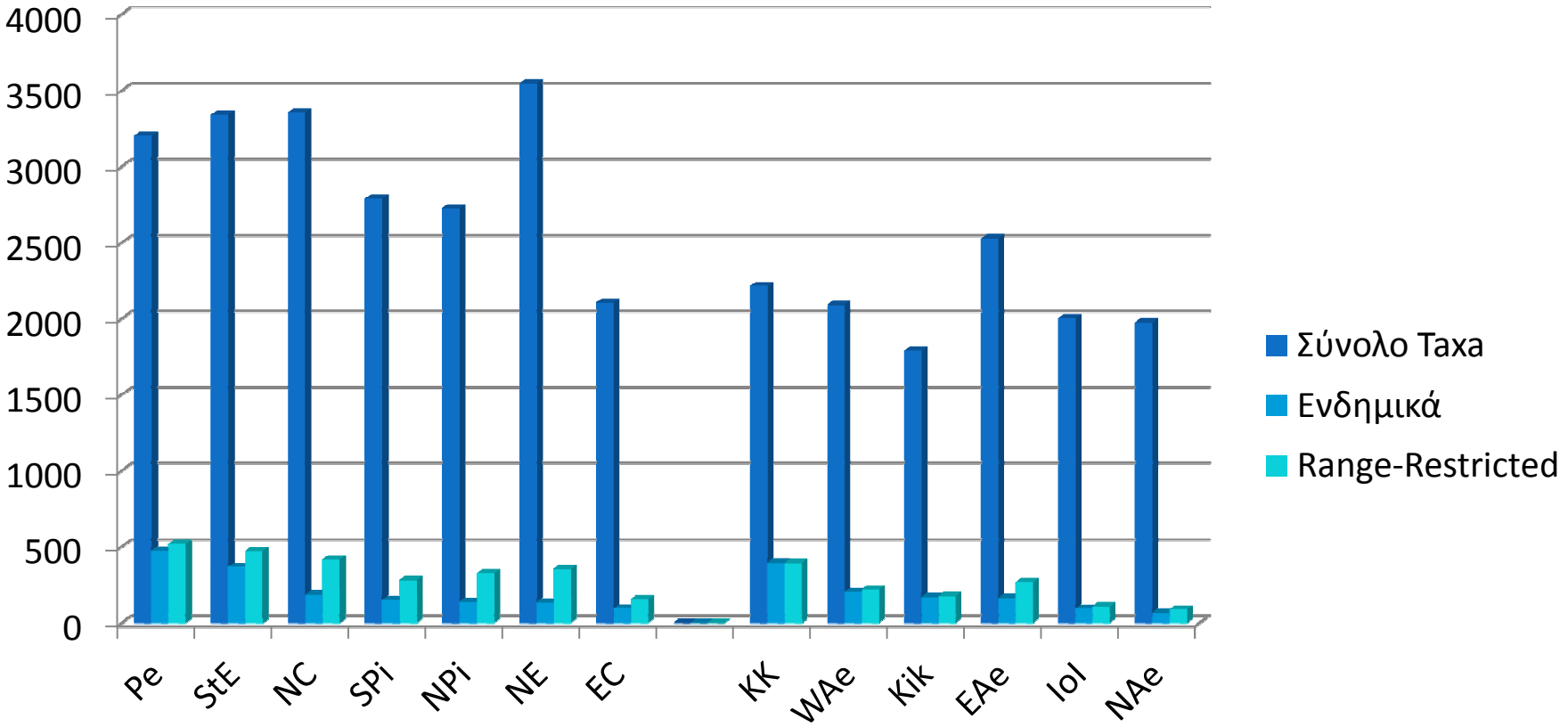
- Its high mountains and islands have acted through geological history as stepping stones and refuges for taxa of the surrounding floristic regions and as isolation centers.



Main geobotanical divisions of Europe

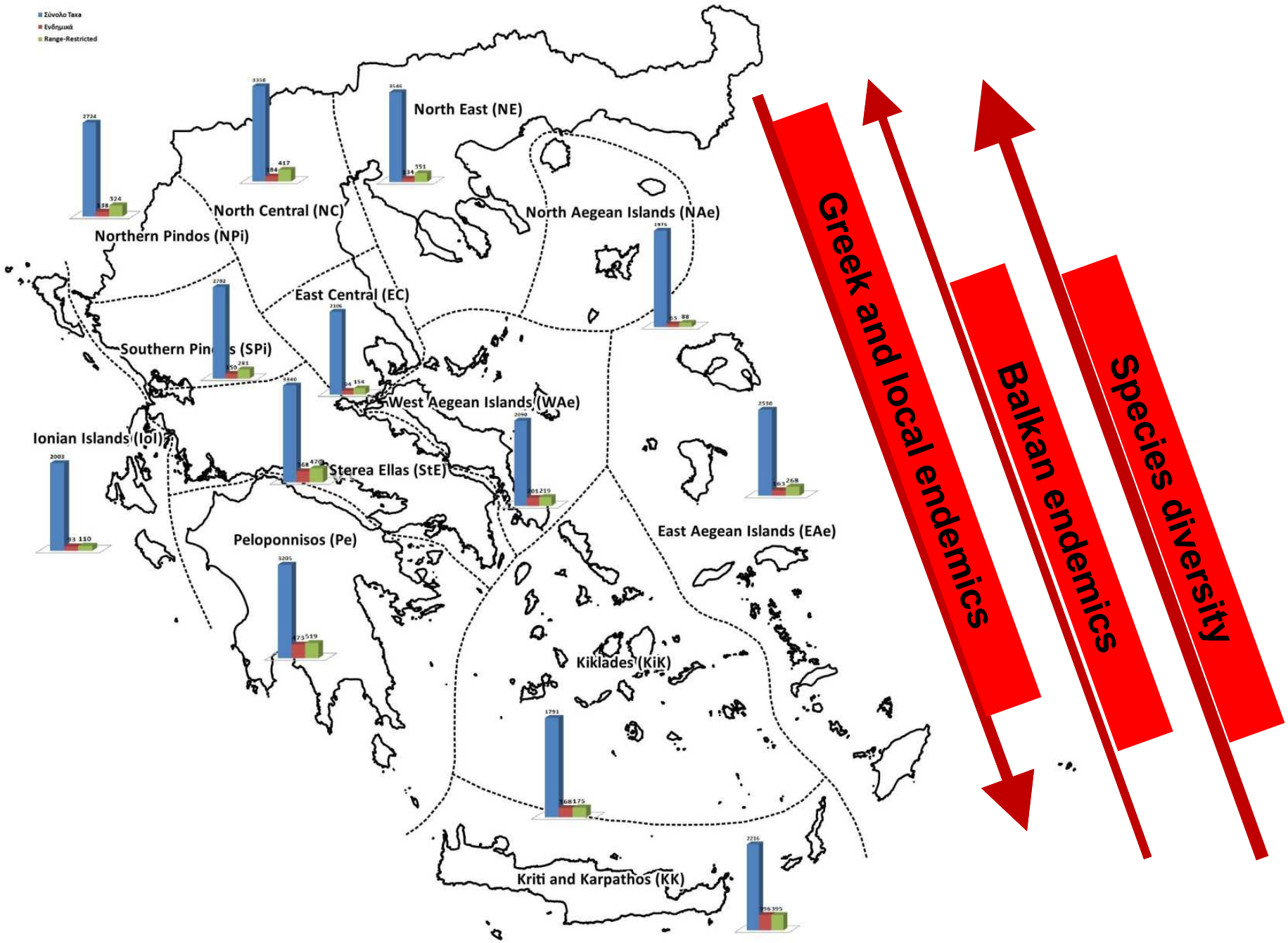
The Greek Flora in numbers

FAMILIES	GENERA	SPECIES	SUBSPECIES	TAXA
185	1077	5835	1985	**6700**



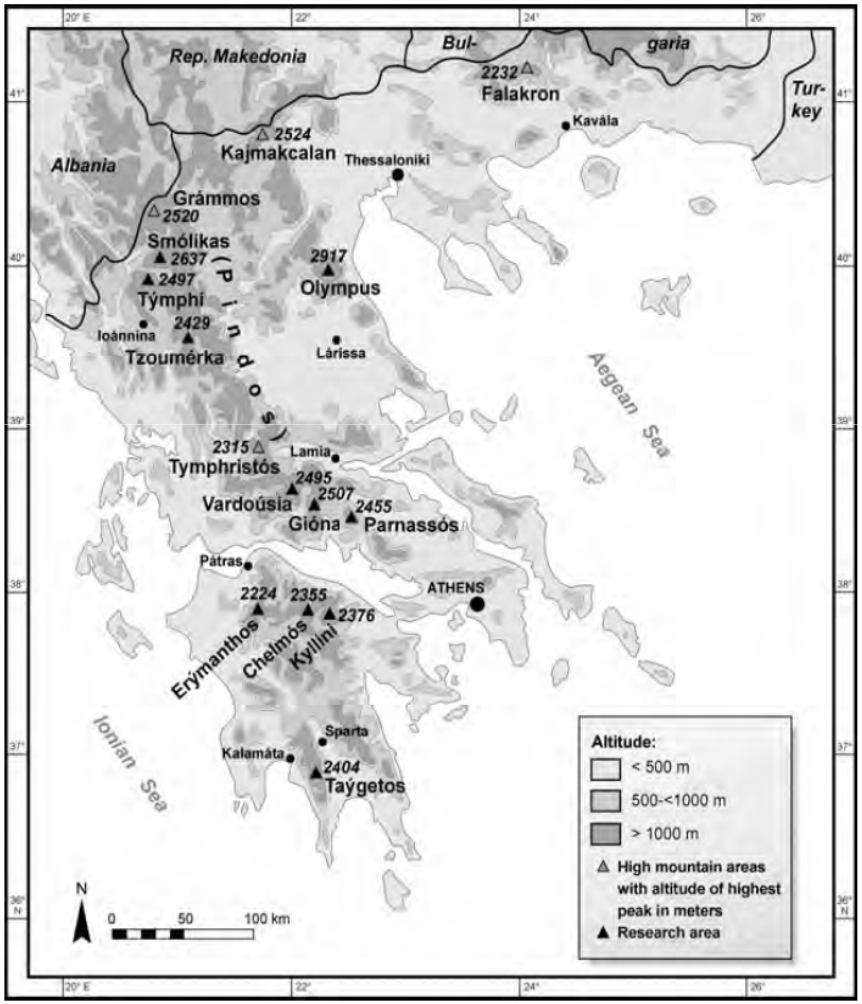
Continental areas **Insular areas**

Distribution of the total species richness, the endemic and the range-restricted taxa in continental and insular areas of Greece


Σύνολο Taxa
Ενδημικά
Range-Restricted
North East (NE)
North Central (NC)
North Aegean Islands (NAe)
Northern Pindos (NPi)
East Central (EC)
Southern Pin s (SPi)
West Aegean Islands (WAe)
Ionian Islands (Iol)
Sterea Ellas (StE)
Peloponnisos (Pe)
East Aegean Islands (EAe)
Kiklades (KiK)
Kriti and Karpathos (KK)
Greek and local endemics
Balkan endemics
Species diversity

Flora of Greece

- Greece is the most species rich of the Balkan countries
- Greece is characterized by high plant diversity (5835 species) and endemism (22.3%).
- Nr of taxa: 6700 (native and naturalized) taxa
- These belong to 1077 genera and 185 families
- The most species-rich mountain flora is found in N Greece (Epirus, Macedonia and W Thrace), where several phytogeographical elements meet and there are large land areas above 1000m (Strid 1986, Strid & Tan 1991)



The high mountains of the Greek mainland

Table 2. Species diversity and endemism in regions of the Mediterranean, Europe, Africa and South America

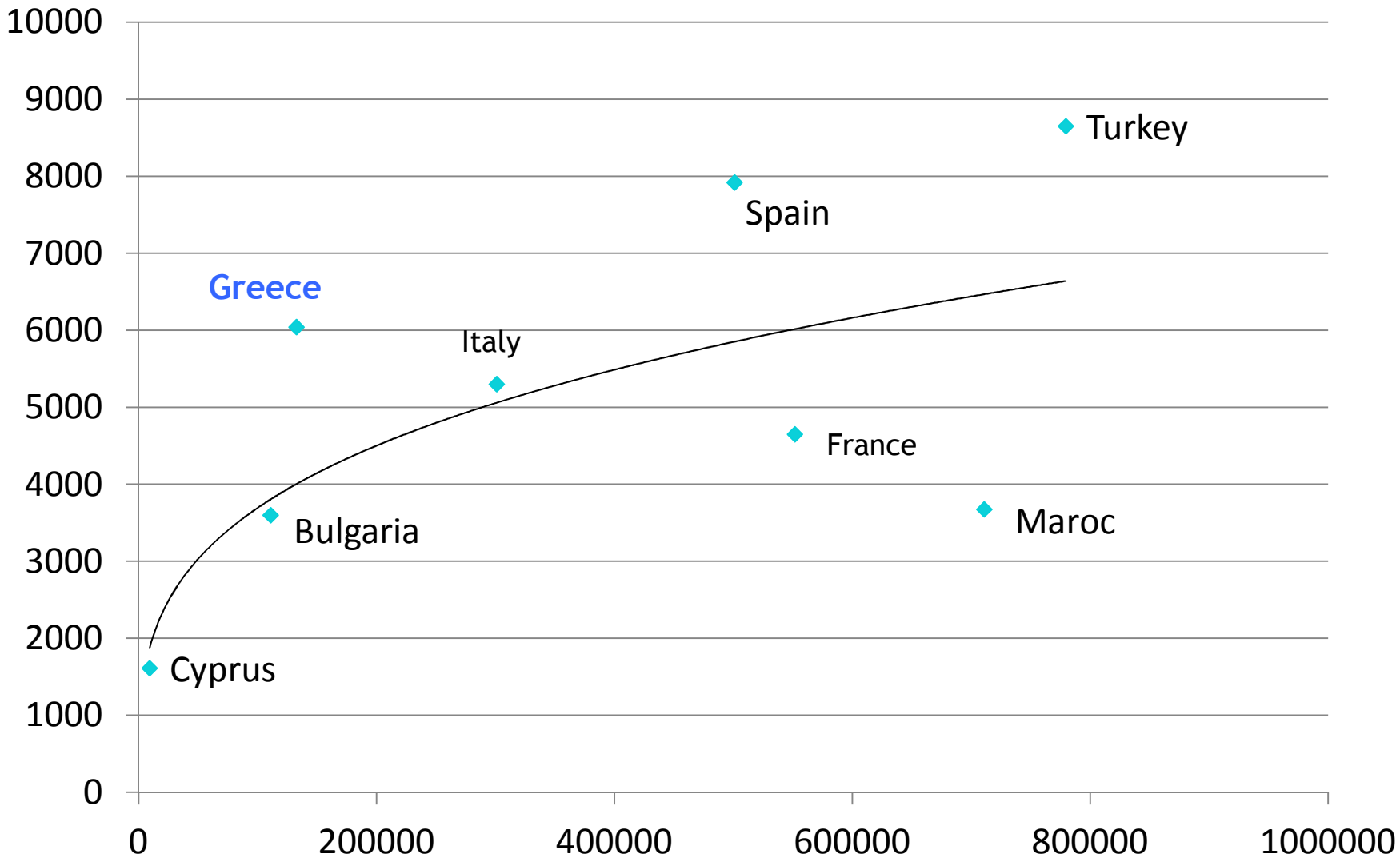
Region	Area km²	Native species	sp/*log*area	*log*sp/ *log*area	Endemic species	% Endemic	Source*
Greece	132 700	5 855	1143	0.74	913	15.6	1, 2, 3
Cyprus	9 251	1 612	406	0.81	110	6.8	5, 4
Bulgaria	111 000	3 600	714	0.70	320	8.9	6
Italy (territory)	301 049	5 300	967	0.68	712	13.4	7
France (territory)	551 700	4 650	810	0.64	133	2.9	6
Peninsular Spain (+ Balearics)	501 000	7 920	1390	0.68	550	6.9	8
Canary Islands	14 879	1 800	431	0.78	550	30.6	8
UK	244 754	1 800	334	0.60	16	0.9	6, 9
Turkey	779 500	8 650	1468	0.67	2 675	30.9	10
Morocco	710 850	3 675	628	0.61	625	17.0	6
Southern Africa	2 570 000	20 372	3178	0.67	16 298	80.0	11
Madagascar	587 000	10 000	1734	0.69	8 000	80.0	6
Chile	462 820	4 669	824	0.65	2 700	57.8	6, 12
California (MTE)	242 519	5 050	938	0.69	1 515	30.0	13
Argentina	2 770 000	9 370	1454	0.62	1 100	11.7	6
Panama	75 648	9 900	2029	0.82	1 222	12.3	6
Venezuela	1 148 154	21 070	3477	0.71	8 000	38.0	6

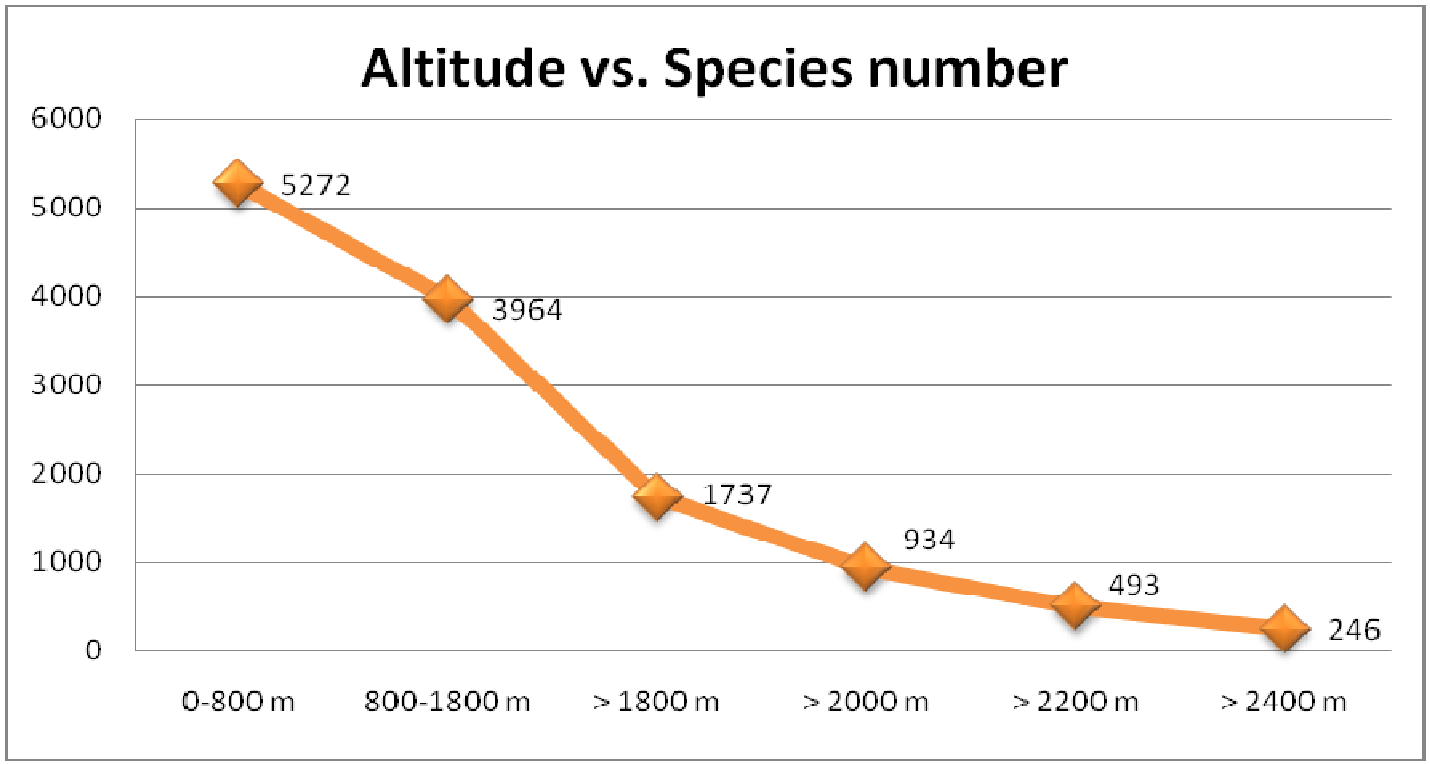
*Sources: 1, Strid & Tan, 1997; 2, Tan & Iatrou, 2001; 3, Chloris database; 4, database CyprusFlora; 5, Hadjikyriakou, 1997; 6, WWF & IUCN, 1994; 7, Pignatti, 1995; 8, Bueno *et al.*, 1995; 9, WWF & IUCN, 1988; 10, Davis, 1965–1986; 11, Cowling & Hilton-Taylor, 1994; 12, Fuentes *et al.*, 1995; 13, Keeley & Swift, 1995.

Taking species richness in relation to area size as a measure of biodiversity, Greece, with an estimated 6437 native plant taxa or *c.* 5800 species (Strid & Tan, 1997, 2002; Tan & Iatrou, 2001), ranges among the highest in European and Mediterranean or Mediterranean-type climate areas (Table 2).

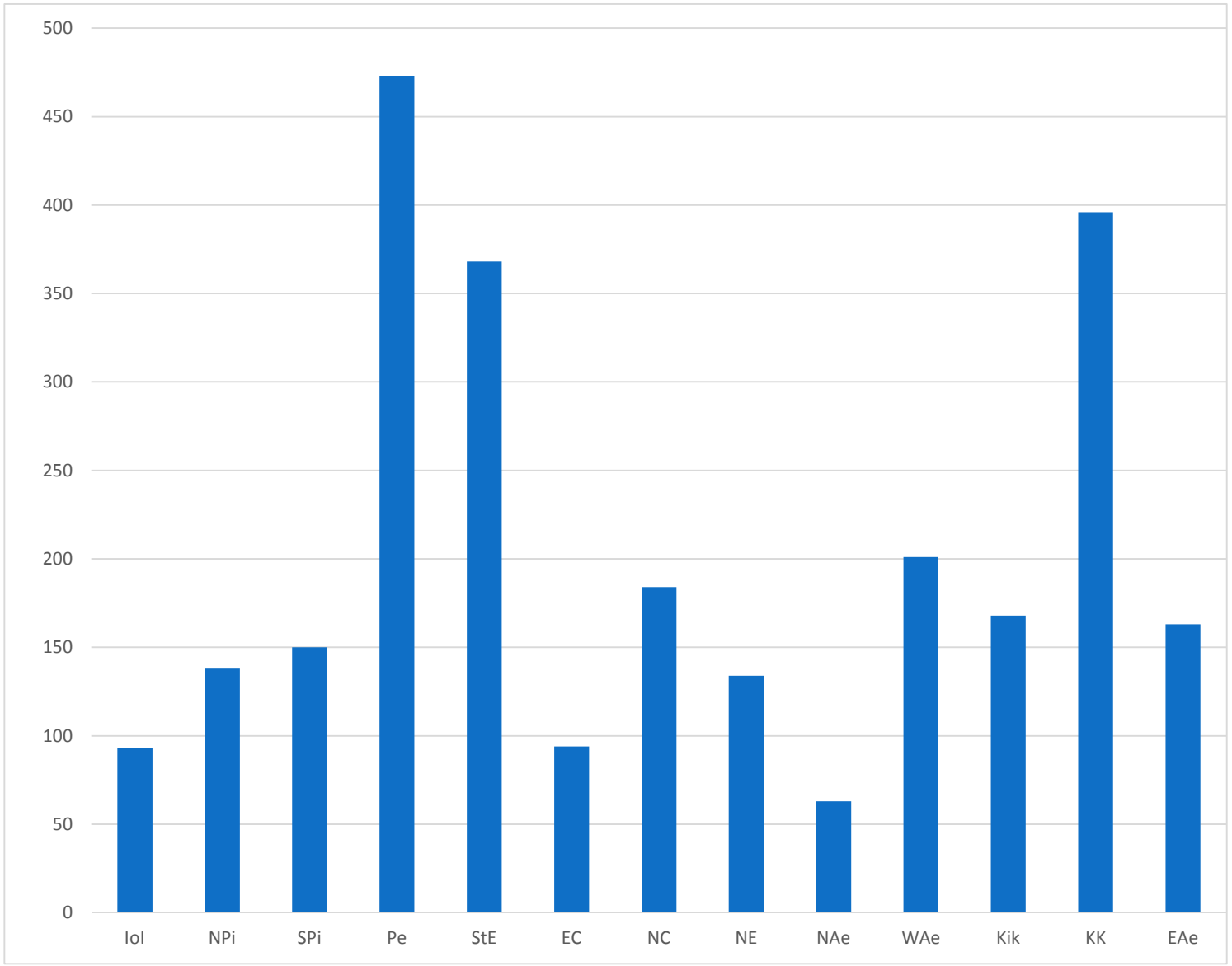
The prediction for the flora of Greece in accordance to its surface area comes to 4000 species. However, the actual number of plant taxa currently known is 50% higher compared with the statistically expected species richness.

Greece covers 6% of the total Mediterranean area, but is characterized by the 26% of the Mediterranean plant species.





Altitudinal zone	Number of vascular plant species in Greece	Percentage (%) of the total vascular flora of Greece
0-800 m	5272	90.9
800-1800 m	3964	68.3
> 1800 m	1737	29.9
> 2000 m	934	16.1
> 2200 m	493	8.5
> 2400 m	246	4.2



Total number of endemics per floristic region

Endemism and speciation in Greece

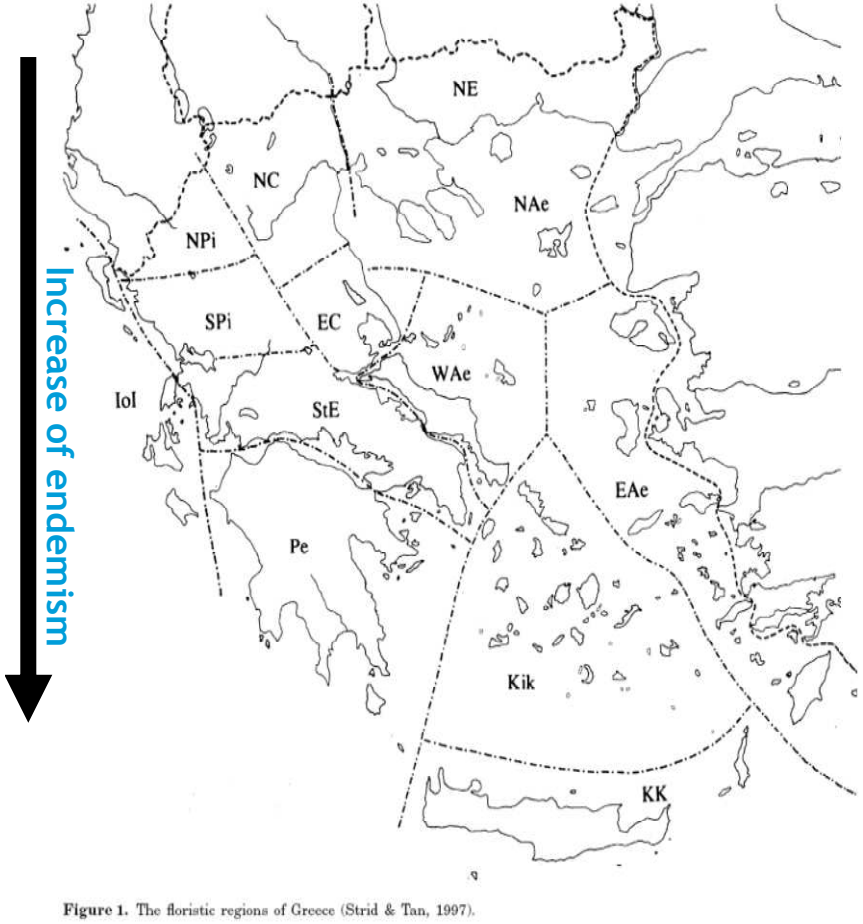


Figure 1. The floristic regions of Greece (Strid & Tan, 1997).

The floristic regions of Greece (Strid & Tan 1997)

- Incidence of endemism increases with altitude and in a southerly direction reflecting the age and isolation of oro-mediterranean floras
- **Nr. of endemics: 1491 (22.3 % of the total flora)**
- **Nr. of range-restricted taxa: 2006 (30% of the total flora)**
- Among mountain plants of the categories: Greek endemics + single-area endemics + single mountain endemics:
  42% in Crete
  26.4% in Peloponnisos
  21.6% in Sterea Hellas
  10-6.4% in more northerly regions

Endemism and speciation in Greece

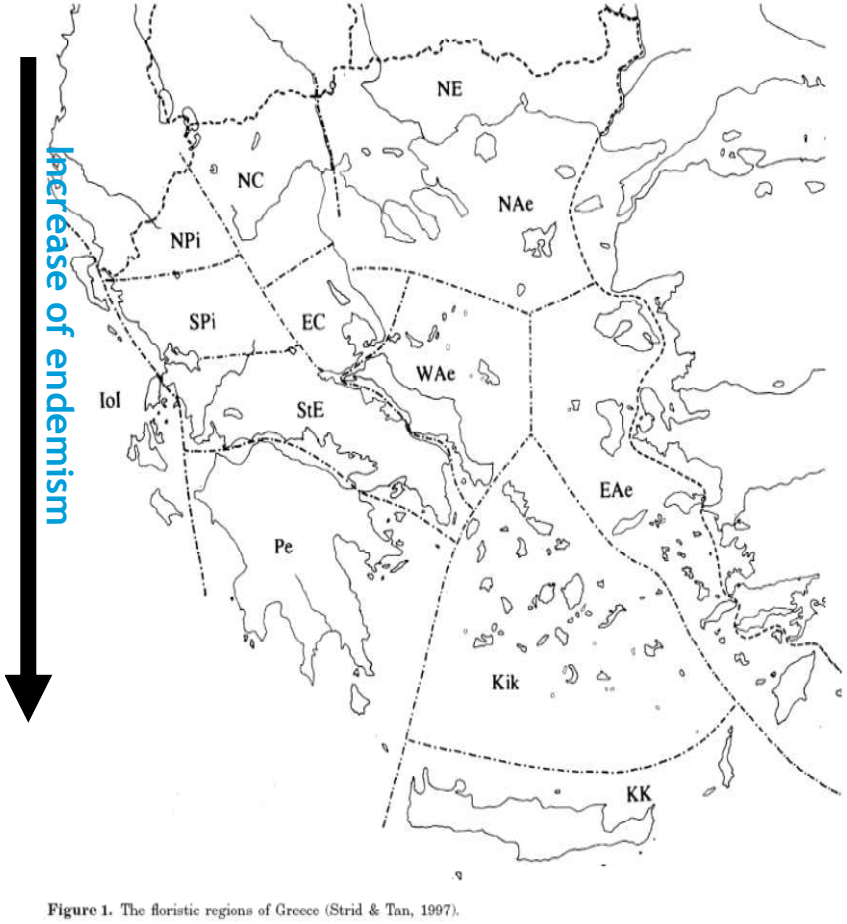


Figure 1. The floristic regions of Greece (Strid & Tan, 1997).

The floristic regions of Greece (Strid & Tan 1997)

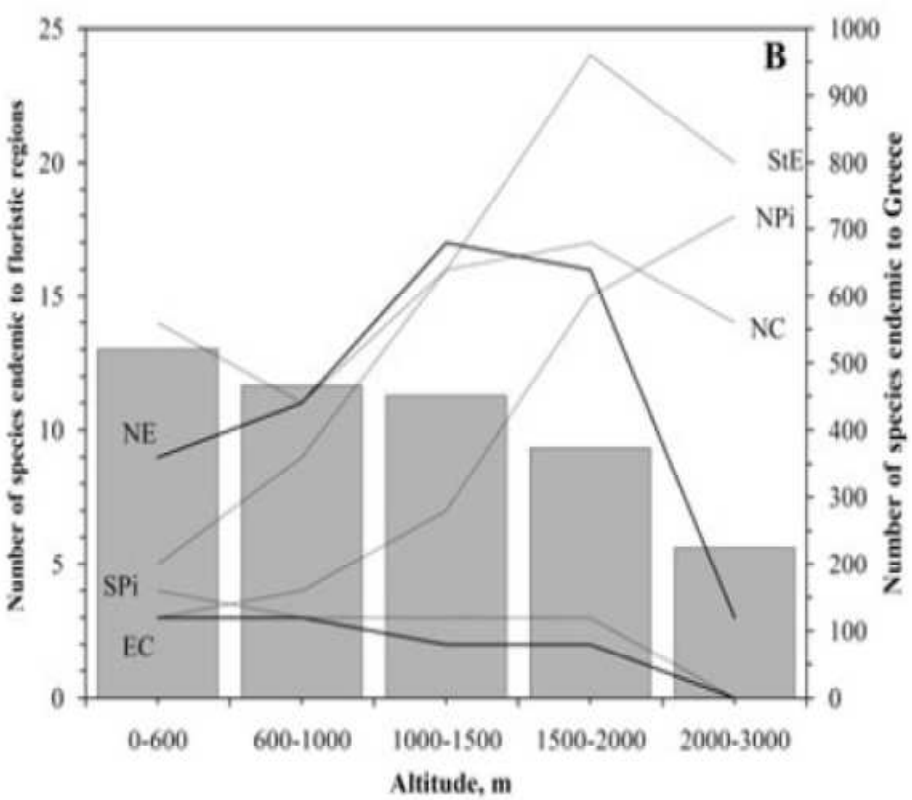
The high incidence of local and regional taxa in the Greek mountains results from:

- the survival of ancient, regressive species (paleo-endemics) but mainly from
- recent speciation through geographical isolation (neo-endemics)

Endemism and speciation in Greece

Table 1. Correspondence of vegetation zones to altitude range classes

Zone	Altitude range (m)	Description
A	0–600	Thermo-Mediterranean: Eu-Mediterranean matorral and thermophilous conifer zone (coastal, hilly, submountainous)
B	600–1000	Meso-Mediterranean: Sub-Mediterranean shrub and forest (hilly, submountainous)
C	1000–1500	Supra-Mediterranean: *Fagus* and *Abies* forest zone (including sub-Mediterranean conifers)
D	1500–2000	Mountain Mediterranean: Boreal conifer (e.g. *Picea*) zone
E	2000–3000	Oro-Mediterranean/Alpine. No forests



- Rise of the endemics at altitudes from 0 - 600 m.
- A gradual fall at higher altitudes, more remarkable above 2000 m.

In continental Greece, including StE, NE and EC, the endemics are concentrated at altitudes above 600 m. This pattern is more pronounced in the high-altitude mountainous areas of SPi, NPi and NC.

Altitudinal range of the Greek endemics

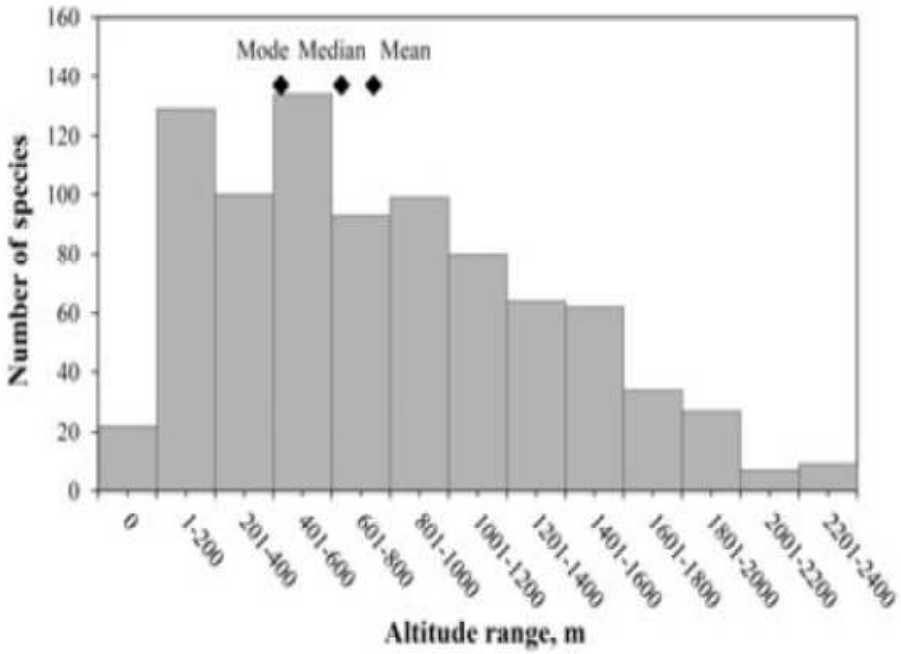


Figure 10. Frequency classes of the altitude range of the Greek endemic species. The analysis included 860 species with adequate data (doubtful and apomictic species excluded).

Although the endemics occur at all altitudes, the altitudinal range of each of them is not as wide:

- nearly half of them have a range of 0–600 m and
- a quarter of them are restricted to only one altitude or within a range of 200 m.
- On the other hand, a significant 31% has an altitudinal range of over 1000 m.

A chestnut (*Castanea sativa*) tree bearing fruits, near Kosmas village. The exploitation of the chestnut forests offers an additional form of income to the local residents.

Alkanna sfikasiana

Sparse *Juniperus drupacea* woodlands in the area of Malevi convent. *Juniperus* gradually colonize the abandoned cultivated fields

Total species diversity of Mt Parnon

- The flora of Mt Parnon still not completely known (1935 m a.s.l. the highest peak, extensive area equal to a planar projection of 900-1000 km^2)
- **Estimation: Its total flora possibly reach 1100 plant taxa (ca. 17% of the total flora of Greece**
- > 225 plant species have been recorded in the mountain zone above 1700 m a.s.l. (of which some are rare and unique to the area)

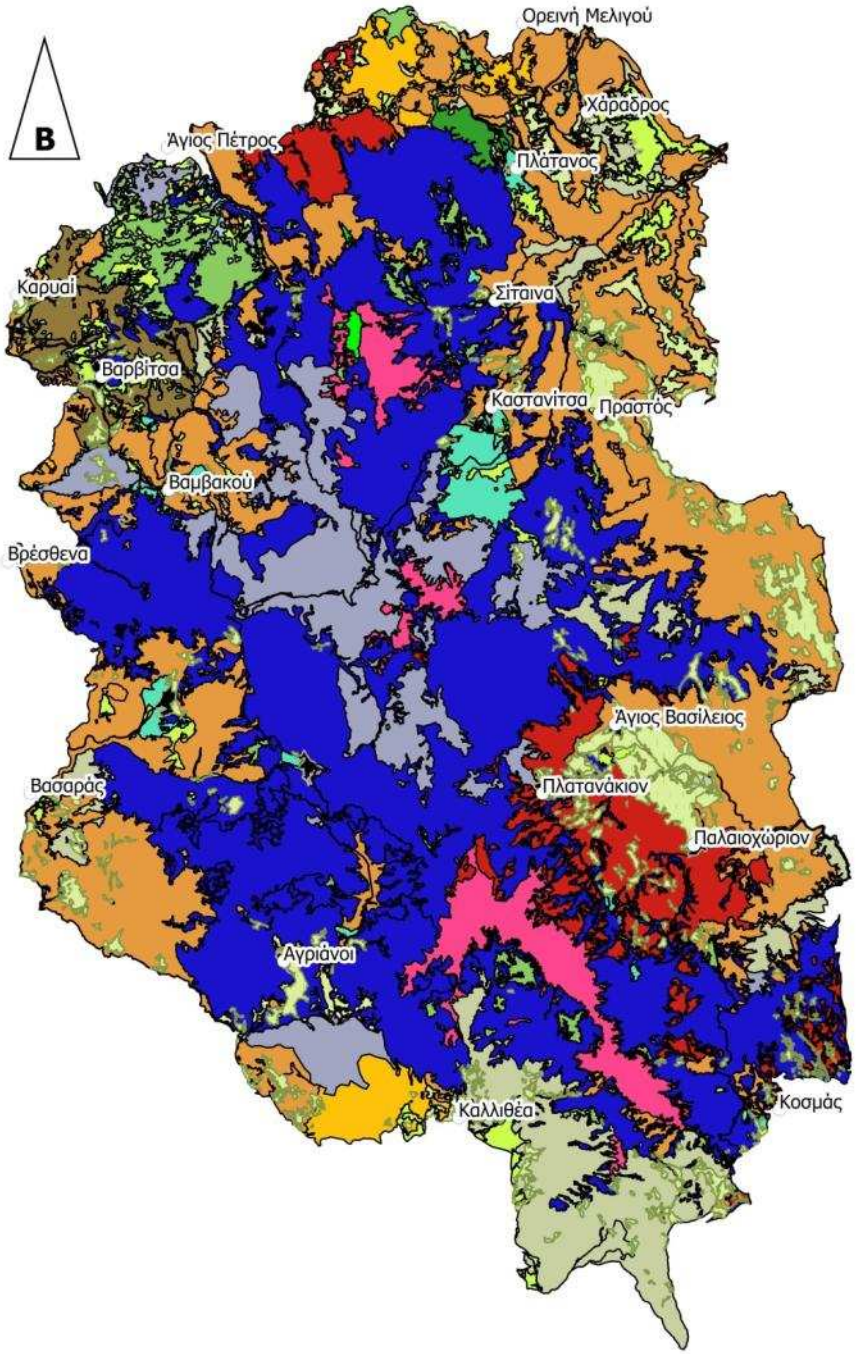
Endemic species diversity of Mt Parnon: local endemics (6 taxa)

- **Local endemics**: species occurring exclusively on Mt Parnon, small populations that grow in a restricted area.

1. *Asperula malevonensis* (Rubiaceae): it occurs only on Megali Tourla and Roussa Petra peaks.
2. *Astragalus agraniotii* (Fabaceae): only two populations of the species have been located, on Megali Tourla and Roussa Petra peaks.
3. *Centaurea leonidia* (Asteraceae): known only from the precipitous rocks in the area of Leonidio.
4. *Nepeta orphanidea* (Lamiaceae): limited to a few peaks around Megali Tourla.
5. *Silene laconica* (Caryophyllaceae): growing in the foothills and on slopes of the eastern parts of Mount Parnon.
6. *Viola parnonia* (Violaceae): forming populations on Megali Tourla, Gaitanorachi, Meganailias and Rachi Psari peaks.

Endemic species diversity of Mt. Parnon: narrow endemics (22 taxa)

- **Narrow endemics**: species occurring on Mt Parnon and 1-2 additional areas close to the mountain
- **Peloponnesian endemics:** >35 endemics exclusively occurring on Peloponnisos and Kythira island



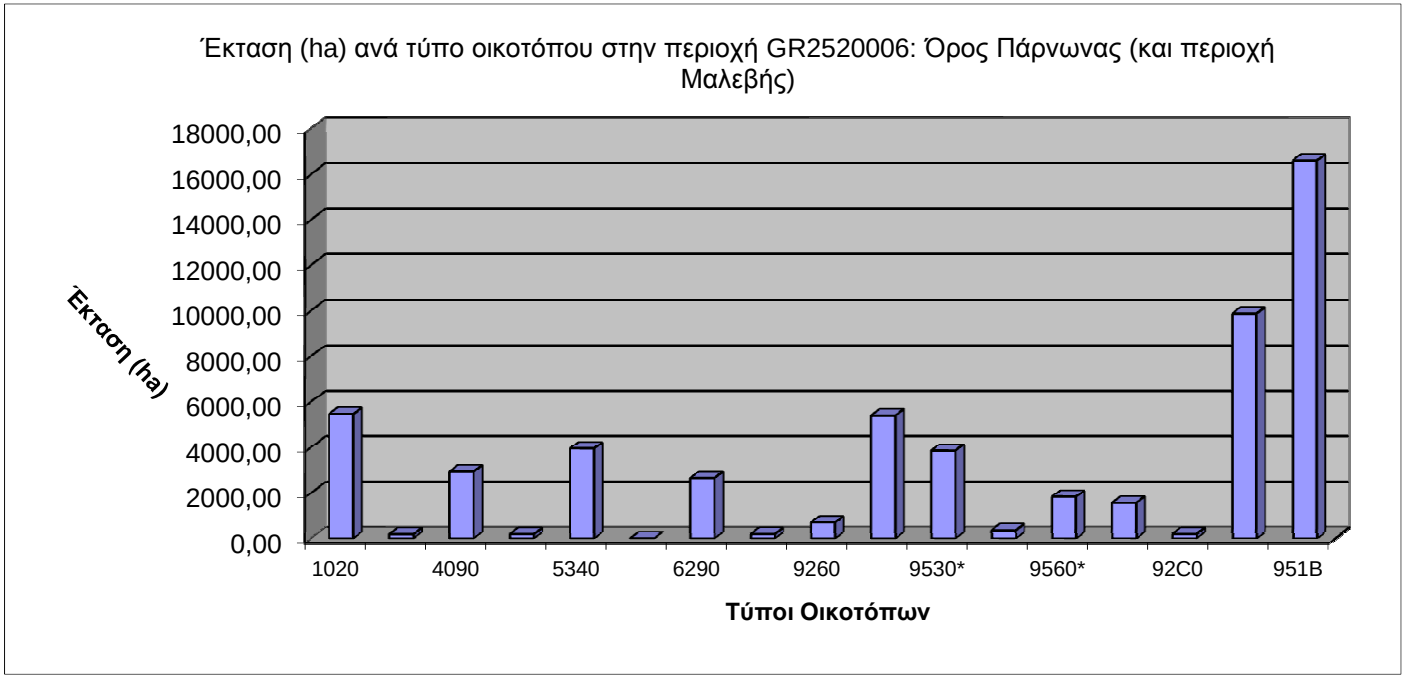
Υπόμνημα

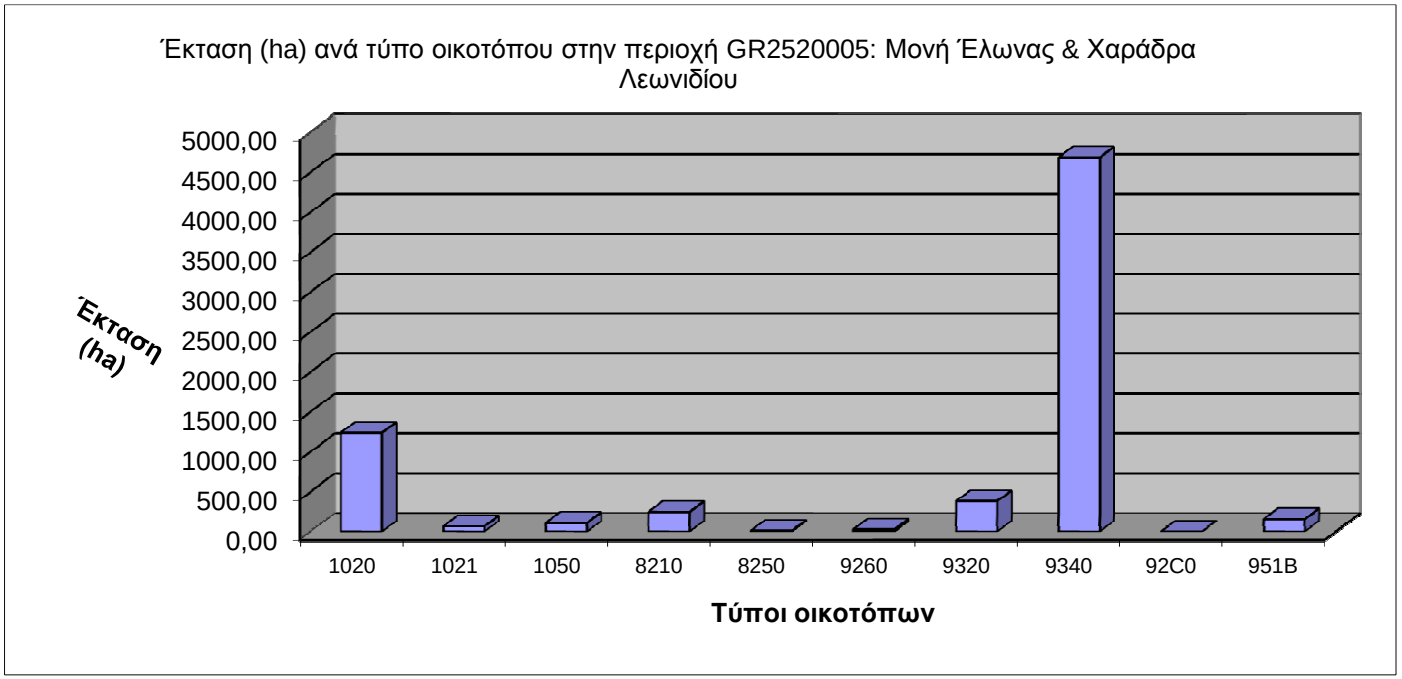
Χρήσεις γης και τύποι οικοτόπων

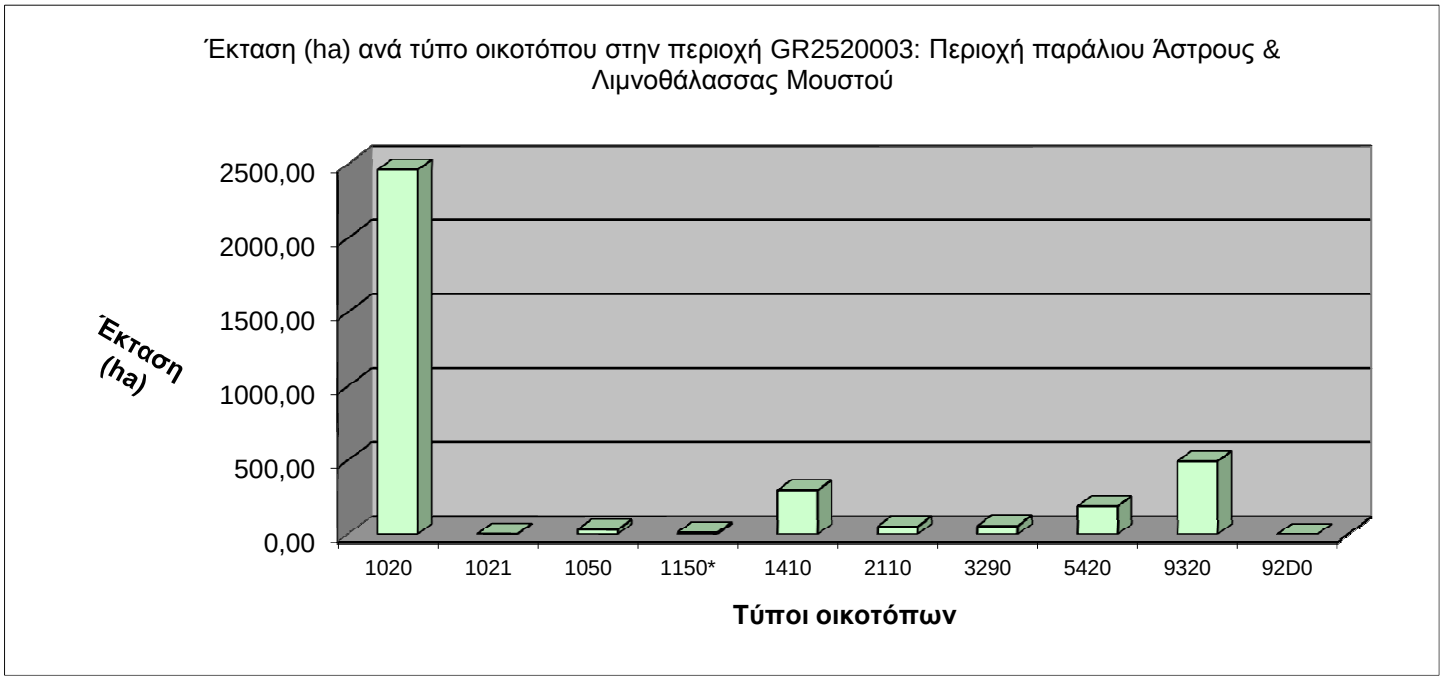
- Οικισμοί / δομημένες εκτάσεις
- Δρόμοι
- Χώρος αναψυχής
- Καλλιέργειες
- Εγκαταλλειμένοι αγροί
- Συλλογές υδάτων
- 4090: Ενδημικά ορεινά μεσογειακά χέρσα εδάφη με ακανθώδεις θάμνους
- 5210: Δενδρώδη matorrals με Juniperus spp.
- 5340: Garrigues της Ανατολικής Μεσογείου
- 5420: Φρύγανα από Sarcopoterium spinosum
- 6230*: Χλοώδεις διαπλάσεις με Nardus, ποικίλων ειδών, σε πυριτικά υποστρώματα των ορεινών ζωνών (και των ημιορεινών ζωνών της ηπειρωτικής Ευρώπης)
- 6290: Μεσογειακοί υπονιτρόφιλοι λειμώνες
- 8210: Ασβεστολιθικά βραχώδη πρανή με χασμοφυτική βλάστηση
- 8250: Βραχώδες υπόστρωμα που δεν καλύπτεται από βλάστηση
- 91M0: Παννωνικά – βαλκανικά δάση κοινής δρυός
- 9260: Δάση με Castanea sativa
- 92C0: Δάση Platanus orientalis και Liquidambar orientalis (Platanion orientalis)
- 9340: Δάση με Quercus ilex και Quercus rotundifolia
- 934A: Ελληνικά δάση πρίνου
- 951B: Δάση ελληνικής ελάτης (Abies cephalonica)
- 9530*: (Υπο-) μεσογειακά πευκοδάση με ενδημικά μαυρόπευκα
- 9540: Μεσογειακά πευκοδάση με ενδημικά είδη πεύκων της Μεσογείου
- 9560*: Ενδημικά δάση με Juniperus spp.
- 9620: Κοίτη ποταμού χωρίς βλάστηση

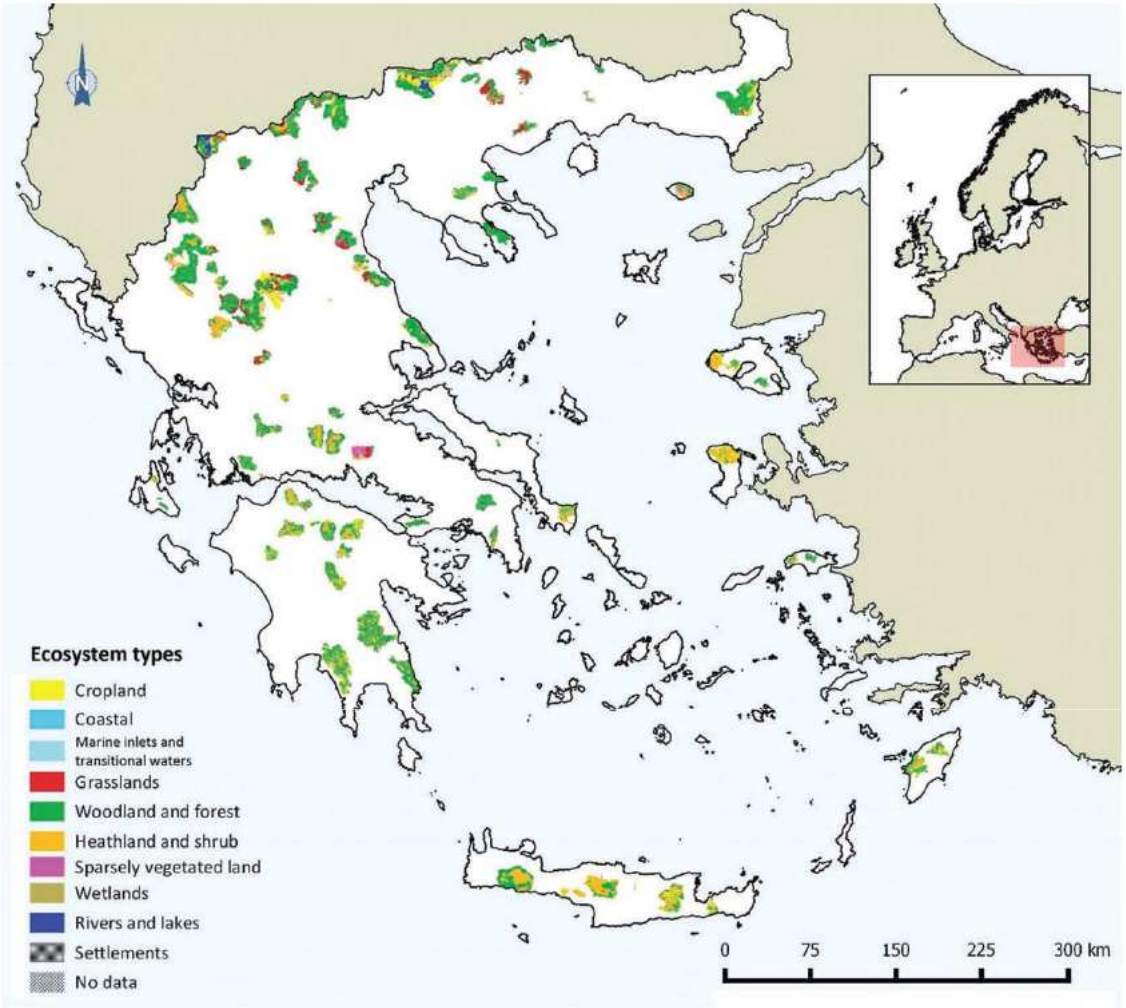
0 5 10 15 20 km

GR2520006: Όρος Πάρνωνας (& περιοχή Μαλεβής)			
Περιγραφή	**Hab**	**Area(sqm)**	**Area(ha)**
	1020	54582612.6	5458.26
	1050	1823932.4	182.39
Ενδημικοί ορο-μεσογειακοί ερεικώνες	4090	29302342.1	2930.23
Σχηματισμοί με άρκευθους	5210	1856920.0	185.69
Garrigues της Αν. Μεσογείου	5340	39451147.5	3945.11
Πλούσιοι σε είδη λειμώνες με Nardus, σε πυριτικό υπόστρωμα της ορεινής περιοχής (και υποορεινής περιοχής, στην ηπειρωτική Ευρώπη)	6230*	490.15	0.05
Μεσογειακοί υπονιτρόφιλοι λειμώνες	6290	26323146.6	2632.31
Ασβεστολιθικά βραχώδη πρανή με χασμοφυτική βλάστηση	8210	1875350.8	187.54
Δάση καστανιάς	9260	6847480.4	684.75
Δάση αριάς *Quercus ilex*	9340	53933163.1	5393.32
Μεσογειακά δάση πεύκης με ενδημικά είδη μαύρης πεύκης	9530*	38454605.8	3845.46
Μεσογειακά δάση πεύκης με ενδημικά μεσογειακά είδη πεύκης περικλειομένων της *Pinus mugo* και *Pinus leucodermis*	9540	3426665.1	342.67
Δασώδεις φυτοκοινωνίες με *Juniperus drupacea*	9560*	18199995.5	1820.00
Θερμόφιλα δρυοδάση της Αν. Μεσογείου και της Βαλκανικής	924A	15466807.2	1546.68
Δάση ανατολικής πλατάνου (*Platanion orientalis*)	92C0	1845713.3	184.57
Ελληνικά δάση πρίνου	934A	98657587.0	9865.76
Δάση ελληνικής ελάτης (*Abies cephalonica*)	951B	165849959.1	16585.00
Σύνολο		557897918.8	55789.79
GR2520005 Μονή Έλωνας & Χαράδρα Λεωνιδίου			
Περιγραφή	**Hab**	**Area(sqm)**	**Area(ha)**
	1020	12376650.3	1237.67
	1021	691087.4	69.11
	1050	1129560.4	112.96
Ασβεστολιθικά βραχώδη πρανή με χασμοφυτική βλάστηση	8210	2466082.2	246.61
Οικότοποι βράχων και σπηλαίων	8250	123063.1	12.31
Δάση καστανιάς	9260	287528.5	28.75
Δάση ελιάς και χαρουπιάς	9320	3846182.2	384.62
Δάση αριάς *Quercus ilex*	9340	46901852.3	4690.19
Δάση ανατολικής πλατάνου (*Platanion orientalis*)	92C0	248.6	0.02
Δάση ελληνικής ελάτης (*Abies cephalonica*)	951B	1586915.3	158.69
Σύνολο		69409170.3	6940.92
GR2520003 Περιοχή παράλιου Άστρους & Λιμνοθάλασσας Μουστού			
Περιγραφή	**Hab**	**Area(sqm)**	**Area(ha)**
	1020	24620372.0	2462.04
	1021	25533.6	2.55
	1050	319887.7	31.99
Λιμνοθάλασσες	1150*	120250.3	12.03
Μεσογειακά αλίπεδα (*Juncetalia maritimi*)	1410	2952808.1	295.28
Υποτυπώδεις κινούμενες θίνες	2110	532688.0	53.27
Ποταμοί της Μεσογείου με περιοδική ροή από Paspalo-Agrostidion	3290	580475.6	58.05
Φρύγανα με *Sarcopoterium spinosum*	5420	1902163.7	190.22
Δάση ελιάς και χαρουπιάς	9320	4915844.8	491.58
Θερμο-Μεσογειακές παραποτάμιες στοές (Nerio-Tamaricetea) και παραποτάμιες στοές της νοτιο-δυτικής Ιβηρικής Χερσονήσου *(Securinegion tinctoriae*)	92D0	271.7	0.03


Έκταση (ha) ανά τύπο οικοτόπου στην περιοχή GR2520006: Όρος Πάρνωνας (και περιοχή Μαλεβής)
18000,00
16000,00
14000,00
12000,00
10000,00
8000,00
6000,00
4000,00
2000,00
0,00
Έκταση (ha)
1020
4090
5340
6290
9260
9530*
9560*
92C0
951B
Τύποι Οικοτόπων


Έκταση (ha) ανά τύπο οικοτόπου στην περιοχή GR2520005: Μονή Έλωνας & Χαράδρα Λεωνιδίου
5000,00
4500,00
4000,00
3500,00
3000,00
2500,00
2000,00
1500,00
1000,00
500,00
0,00
Έκταση (ha)
1020
1021
1050
8210
8250
9260
9320
9340
92C0
951B
Τύποι οικοτόπων


Έκταση (ha) ανά τύπο οικοτόπου στην περιοχή GR2520003: Περιοχή παράλιου Άστρους & Λιμνοθάλασσας Μουστού
Έκταση (ha)
2500,00
2000,00
1500,00
1000,00
500,00
0,00
1020
1021
1050
1150*
1410
2110
3290
5420
9320
92D0
Τύποι οικοτόπων



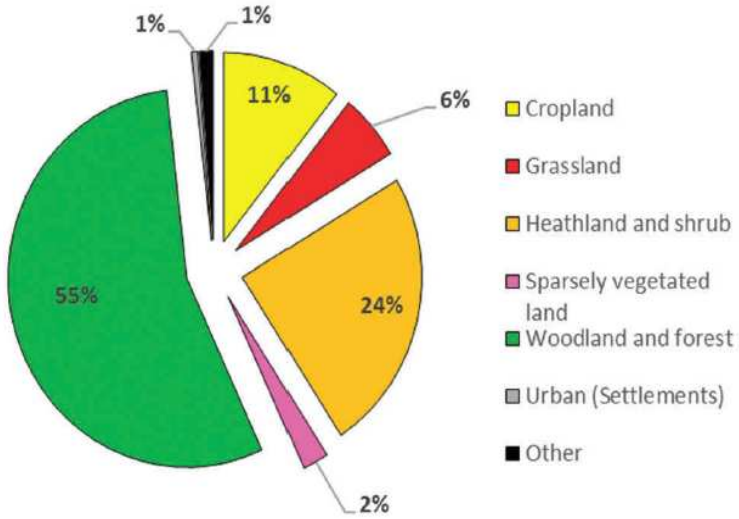
Map of ecosystem types at 91 mountainous sites (SACs) in Greece

The mountainous protected areas in Greece comprise 10 ecosystem types that consist of 87 habitat types (including settlements)

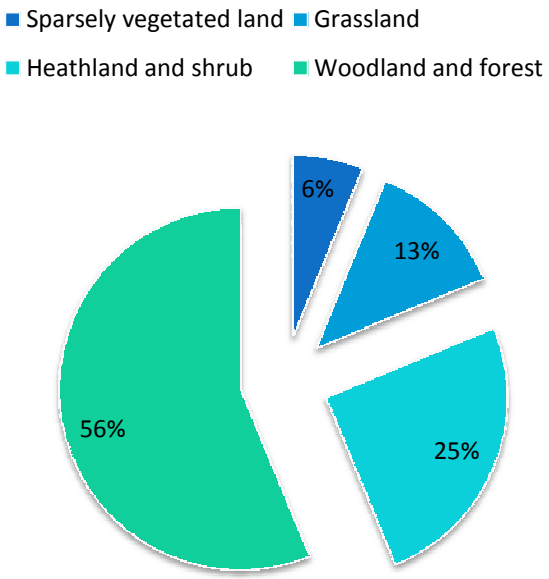
The protected area of Mt Parnon comprises 4 ecosystem types consisting of 16 habitat types (not including settlements)

MAES categories		Natura 2000 Habitat types' codes
Level 1	Level 2	
Terrestrial	Urban (Settlements)	1050
	Cropland	1020, 1021
	Grassland	*5150*, 6170, 6220*, 6230*, 6420, 6430, 6510, 62A0, *651A*
	Woodland and forest	*1030, 1031*, 9110, 9130, 9140, 9150, 9180*, 9250, 9260, 9270, 9280, 9290, 9310, 9340, 9350, 9370*, 9410, 9530*, 9540, 9560*, 9580*, 91CA, *91K0*, 91L0, 91E0*, 91M0, *925A*, 92A0, 92C0, 92D0, *934A, 951B*, 95A0
	Heathland and shrub	2250*, 2260, 4060, 4090, 5110, 5210, 5330, *5340, 5350*, 5420, 5430
	Sparsely vegetated land	*1061*, 1210, 1240, 1310, 2110, 2120, 21B0, *32B0*, 8140, 8210, 8220, 8260, 8310, *8250, UR*
	Wetlands	1410, 1420, 3130, 3170*, 7230, *72A0, 72B0*
Freshwater	Rivers and lakes	3150, 3240, 3260, 3280, 3290, *WB*

Distribution (%) of each ecosystem type in the mountainous sites of Greece (I), on Mount Parnon (II)



I



II

What are the Ecosystem Services?

- **Ecosystem Services (ES):** the contribution of ecosystem structure and function – in combination with other inputs – to human well-being [after Burkhard & Maes (2017)].
- **Ecosystem services (ES) arise** when ecological structures and ecological processes directly or indirectly contribute to human well-being and meet a certain demand from people.

Ecosystem Services

Provisioning

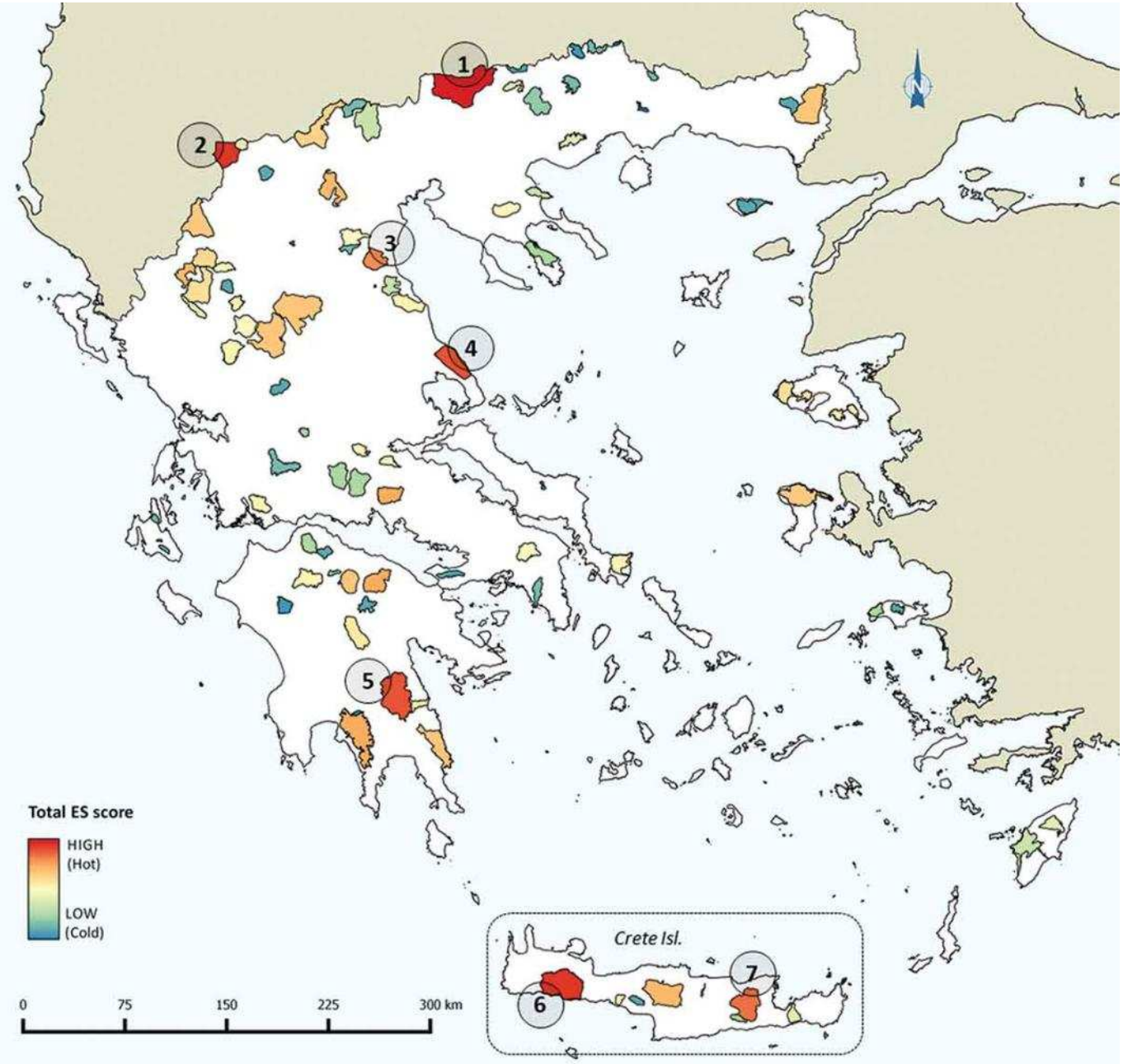
- Συλλογή καυσόξυλων από τους γειτονικούς οικισμούς
- Ρητίνευση
- Συλλογή αρωματικών φυτών, κουκουναριών
- Νερό για άρδευση

Regulating and maintenance

- Συντήρηση της δομής και της έκτασης των αμμοθινών
- Διατήρηση της βιοποικιλότητας
- Προστασία από ισχυρούς ανέμους των καλλιεργειών και των λιμνών
- Διατήρηση επικονιαστών

Cultural

- Περίπατος, υπαίθρια γεύματα κυρίως την άνοιξη και το καλοκαίρι
- Περιβαλλοντική εκπαίδευση / έρευνα
- Χώρος παραθεριστών
- Φωτογράφιση

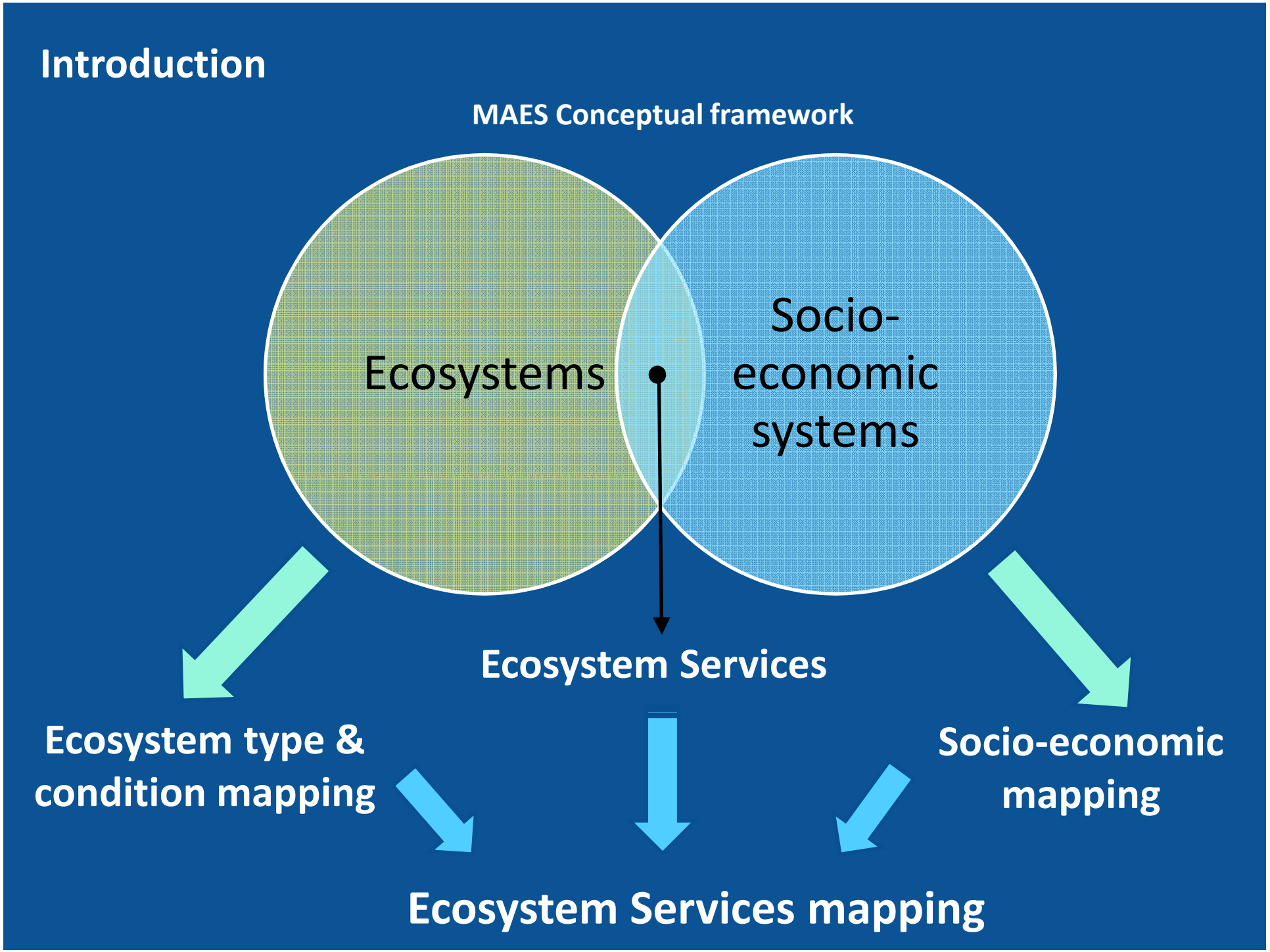


Total scoring of the provided ecosystem services & hot spots at 91 mountainous Natura 2000 sites (SACs) in Greece.

The island of Crete (box at the bottom of the map) is identified as an ES hot spot area.

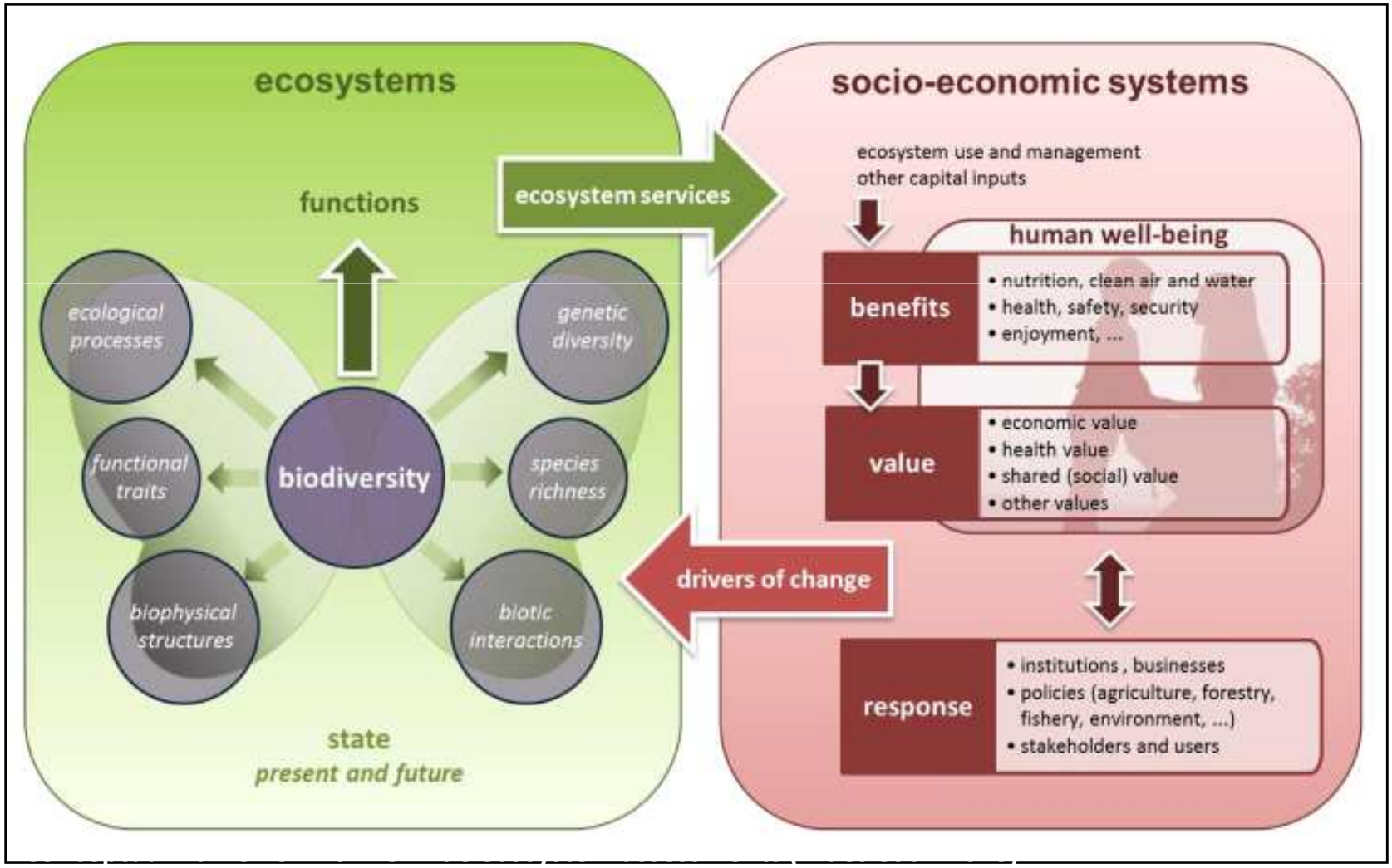
Numbers 1 to 7 indicate the sites with top total ES scores (1: Mt Belles & Lake Kerkini, 2: Prespes lakes area, 3: Mt Olympos, 4: Mt Pilio, 5: Mt Parnon, 6: Mt Lefka Ori, 7: Mt Dikti).

Introduction

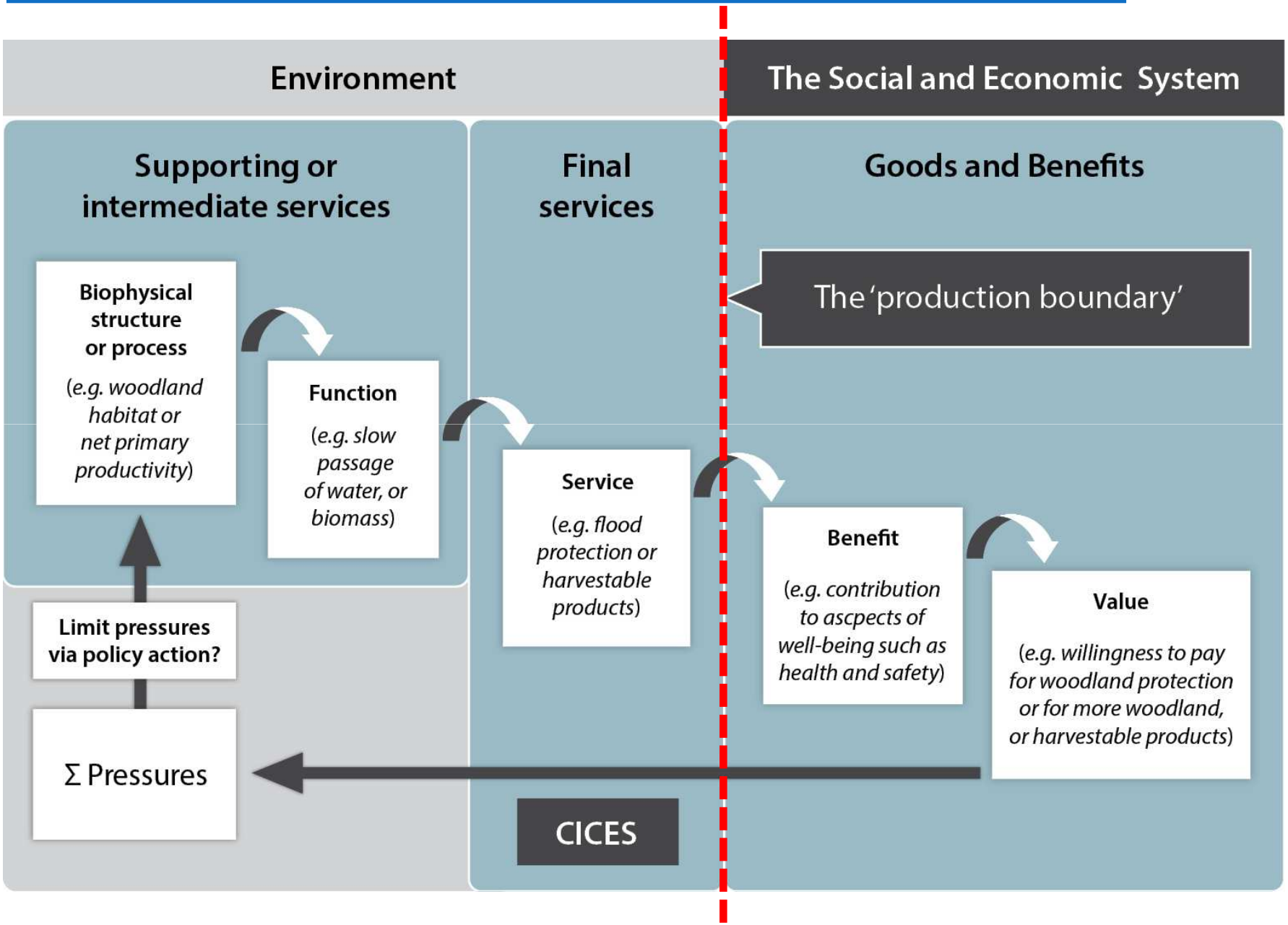


Conceptual framework for EU wide ecosystem assessments

- **Ecosystem Services (ES) Mapping and Assessment should be based on the scale that each parameter of the framework needs to be studied and evaluated.**



The cascade model (Haines-Young and Potschin, 2017)

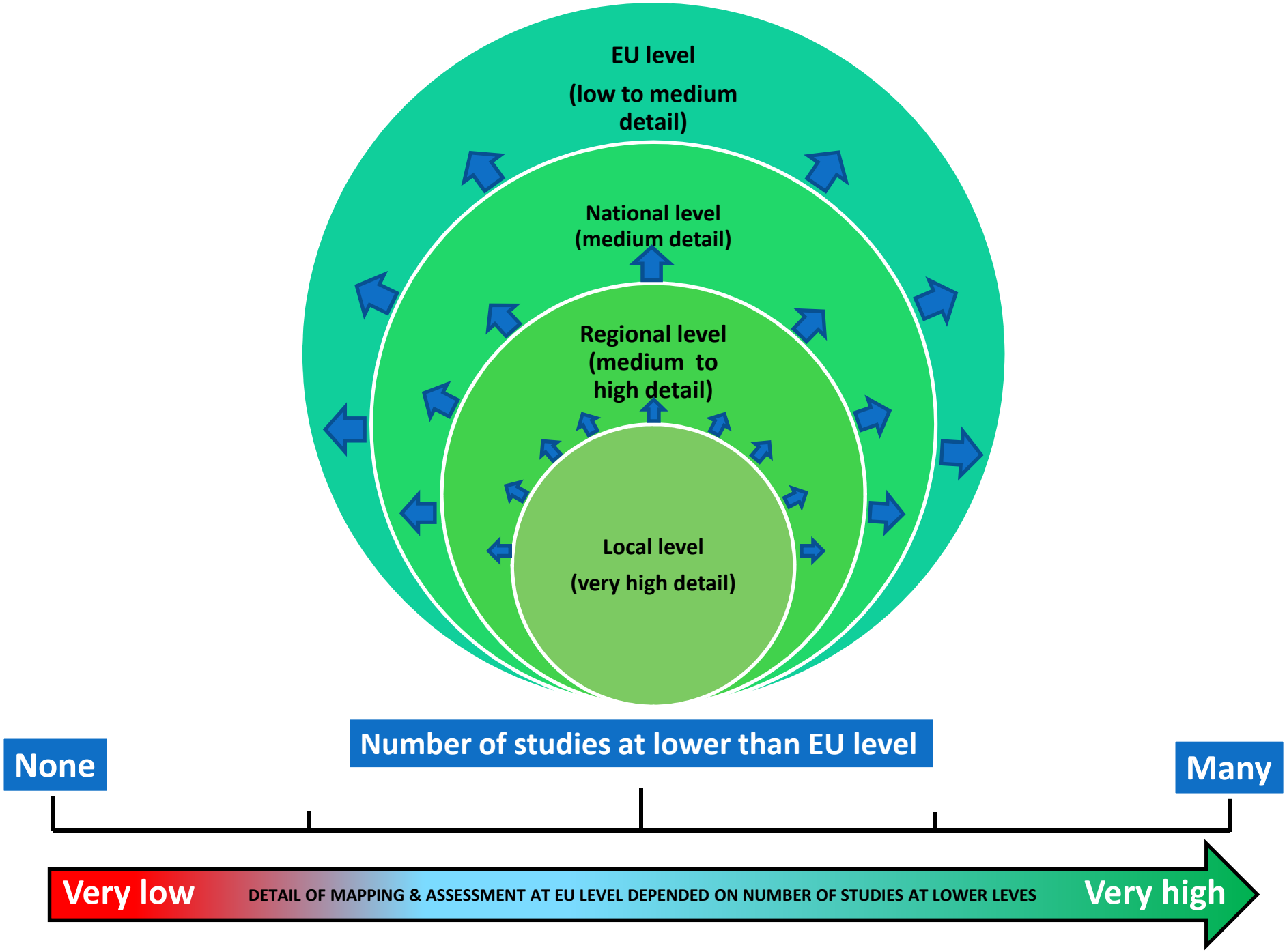


The need of implementing MAES at different spatial scales

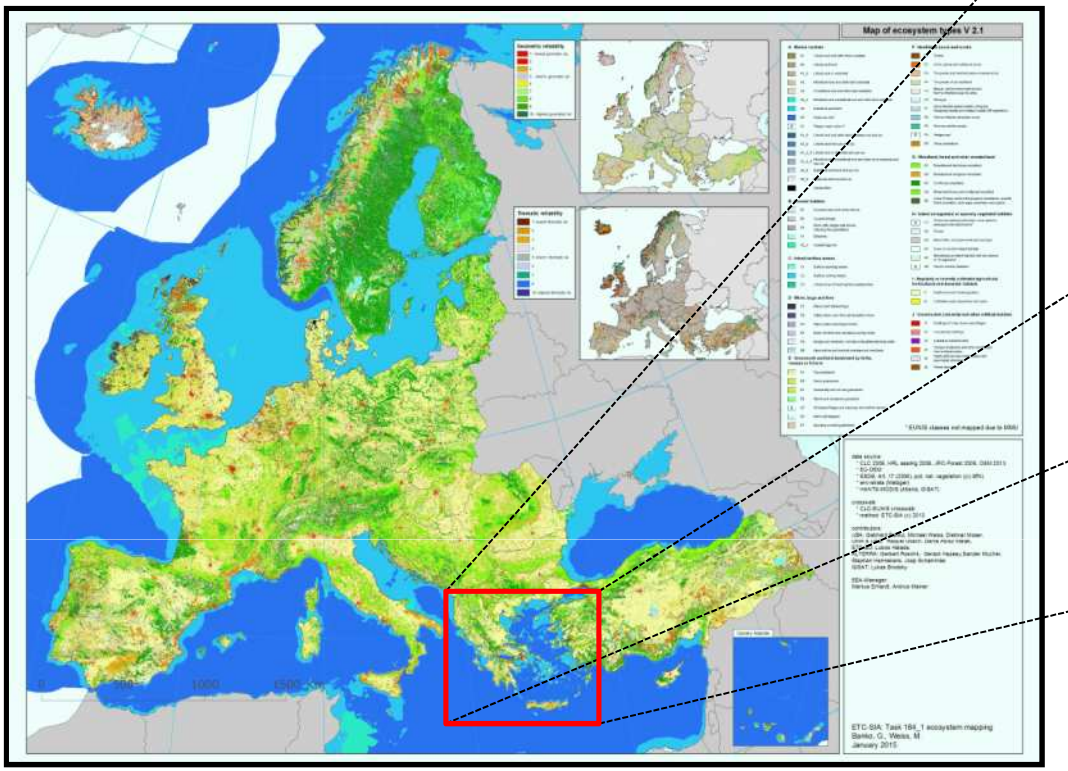
- EU and National Biodiversity Strategies implementation.
- Identification of ecosystem threats at various scales for selecting and implementing conservation actions, respectively .
- Identification and valuation of areas that provide unique ecosystem services within the various spatial scales spectrum (Global, EU, national, regional, local).
- A Policy – Decision making support tool that combines and exploits the outputs form EU to local level assessments, targeting on safeguarding the natural capital and human well-being at all levels.

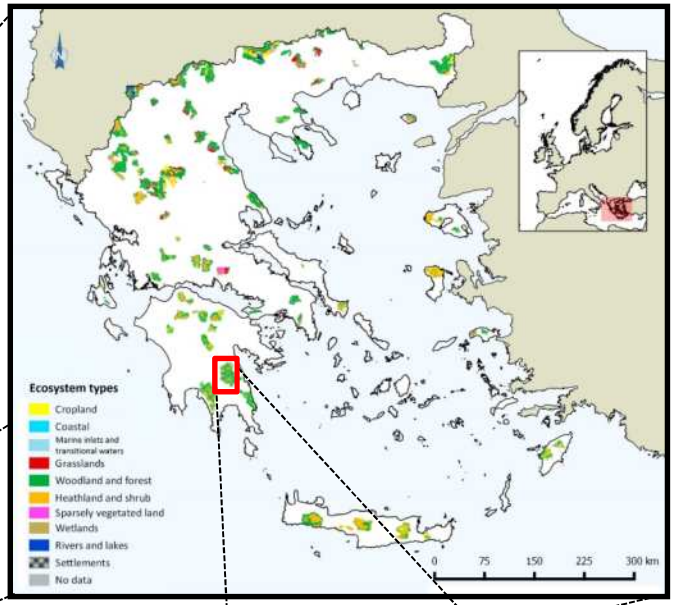
Mapping needs & scales

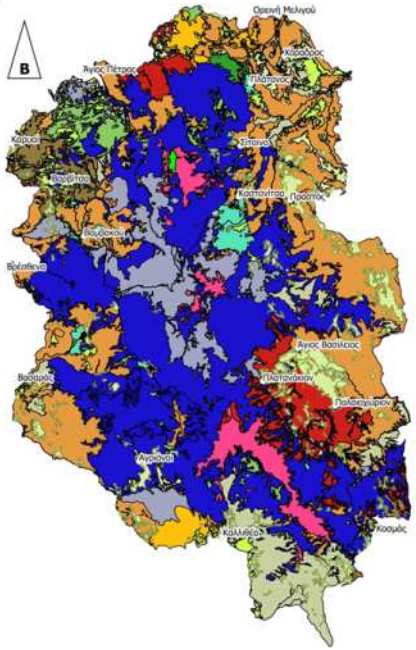
EU level	National level	Regional level	Local level
Ecosystem type & condition	Ecosystem type & condition	Biophysical & socio-economic mapping	Ecosystem functions
Ecosystems' condition in protected areas	Ecosystems' condition in protected areas	Ecosystem services mapping & prioritization	Ecosystem services mapping
Conservation objectives	Conservation objectives	ES demand	ES demand
Conservation actions	Conservation actions	ES flows	ES flows
Spatial distribution of Ecosystem services within EU	National set of ES indicators	Drivers of change	ES valuation
EU Natural Capital Accounting	Ecosystem services index, mapping , ES hot-spot identification & prioritization	ES valuation	Drivers of change and contrasting, future scenarios mapping and assessment
-	National Natural Capital Accounting	Regional Natural Capital Accounting	Contribution to the regional and national capital


EU level
(low to medium detail)
National level
(medium detail)
Regional level
(medium to high detail)
Local level
(very high detail)
Number of studies at lower than EU level
None
Many
Very low
DETAIL OF MAPPING & ASSESSMENT AT EU LEVEL DEPENDED ON NUMBER OF STUDIES AT LOWER LEVES
Very high

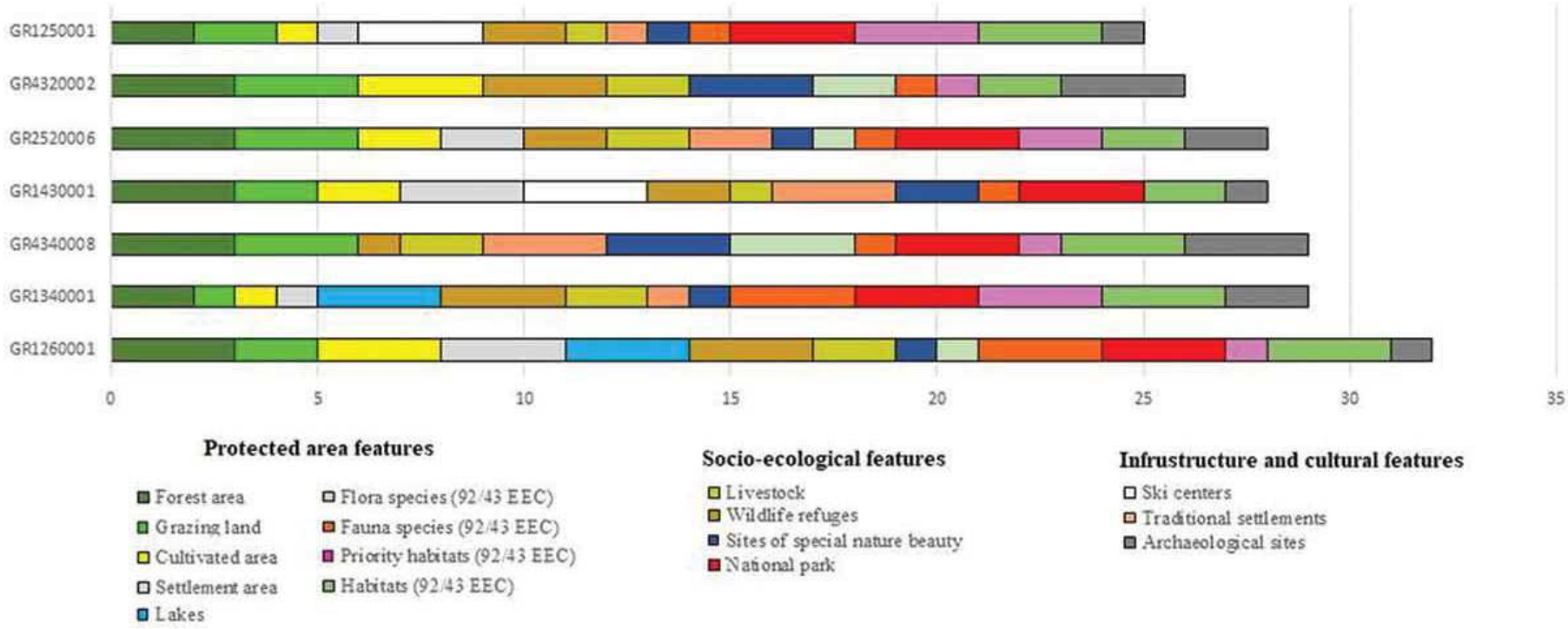
Ecosystem type mapping at different scales

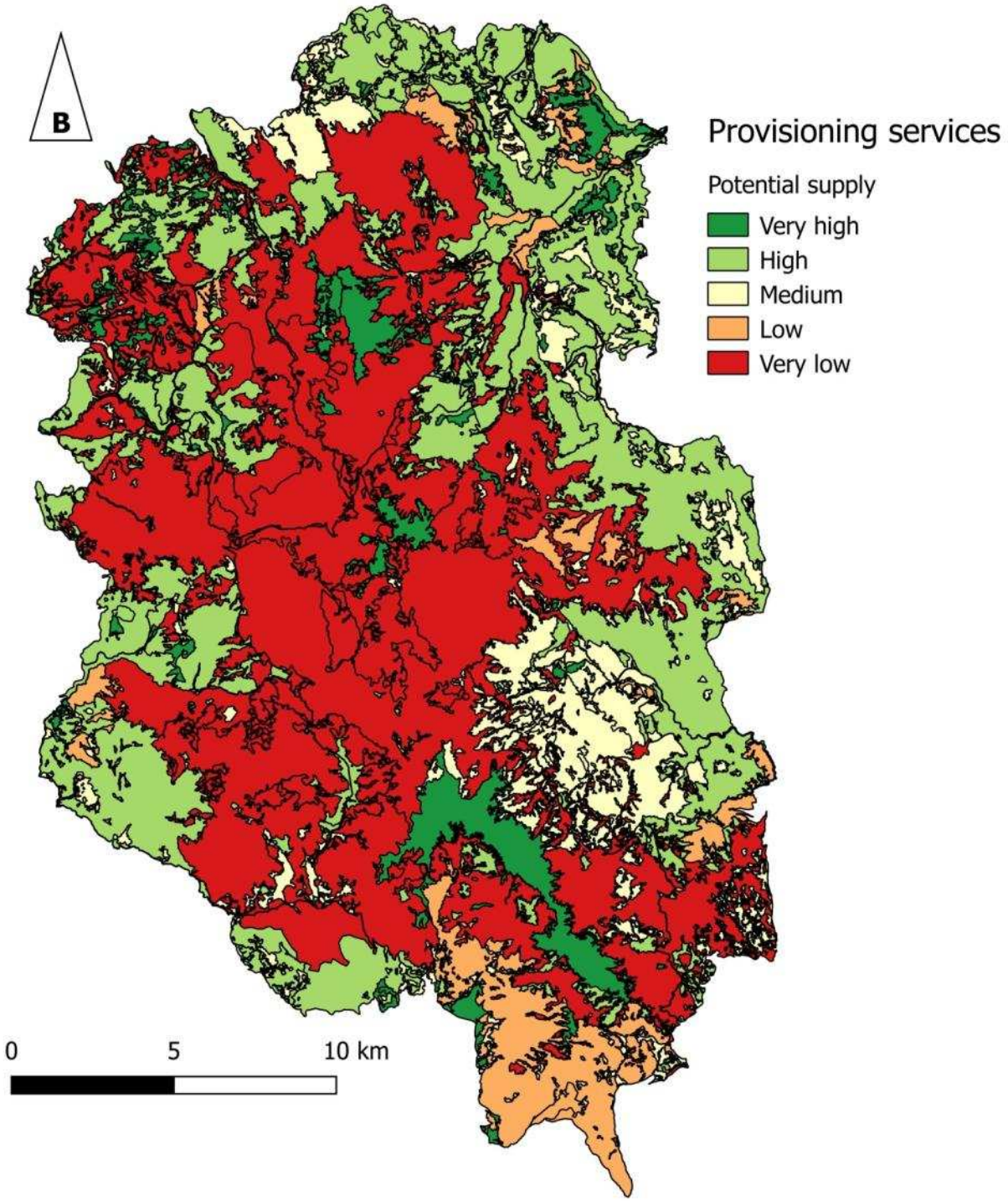


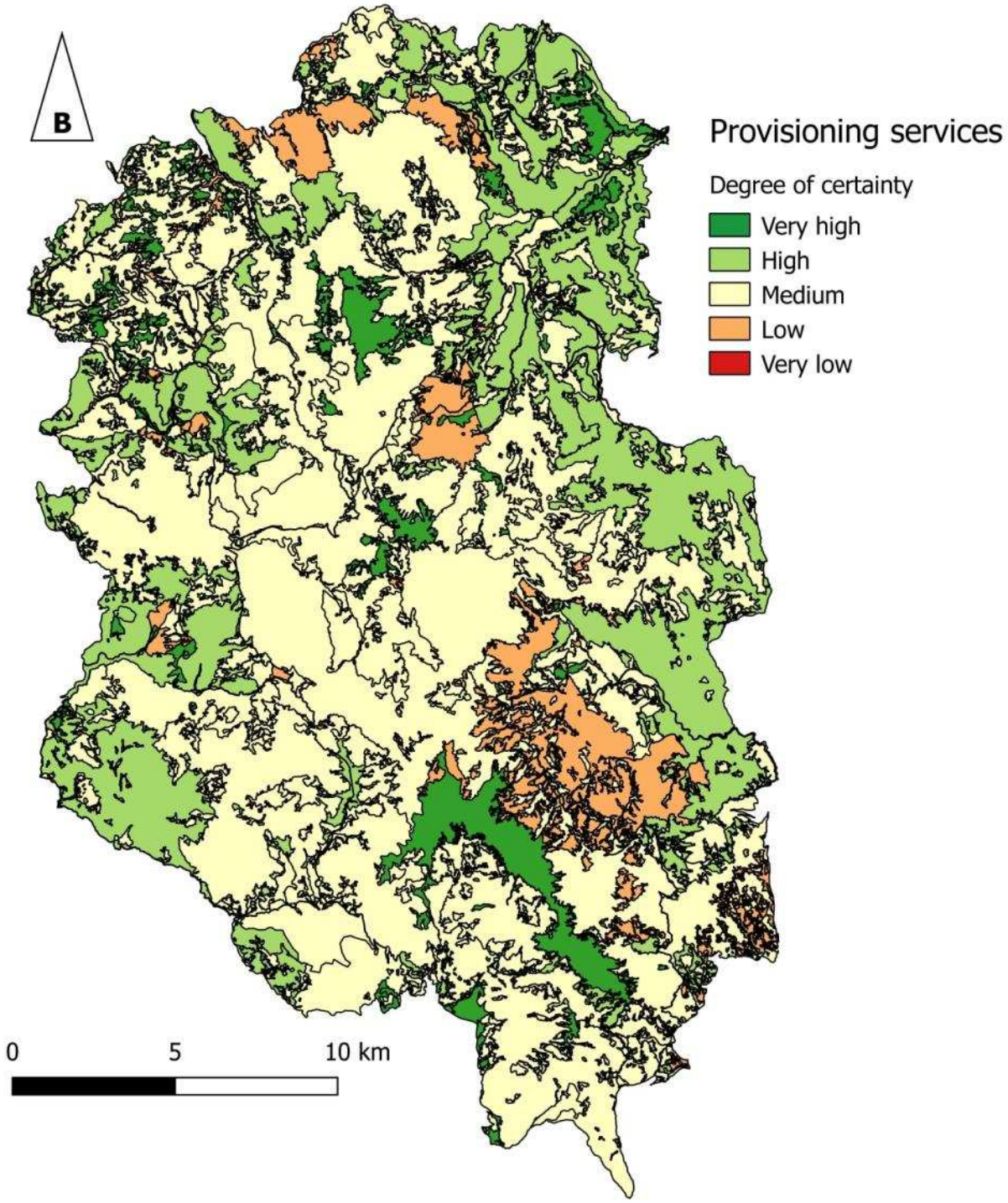


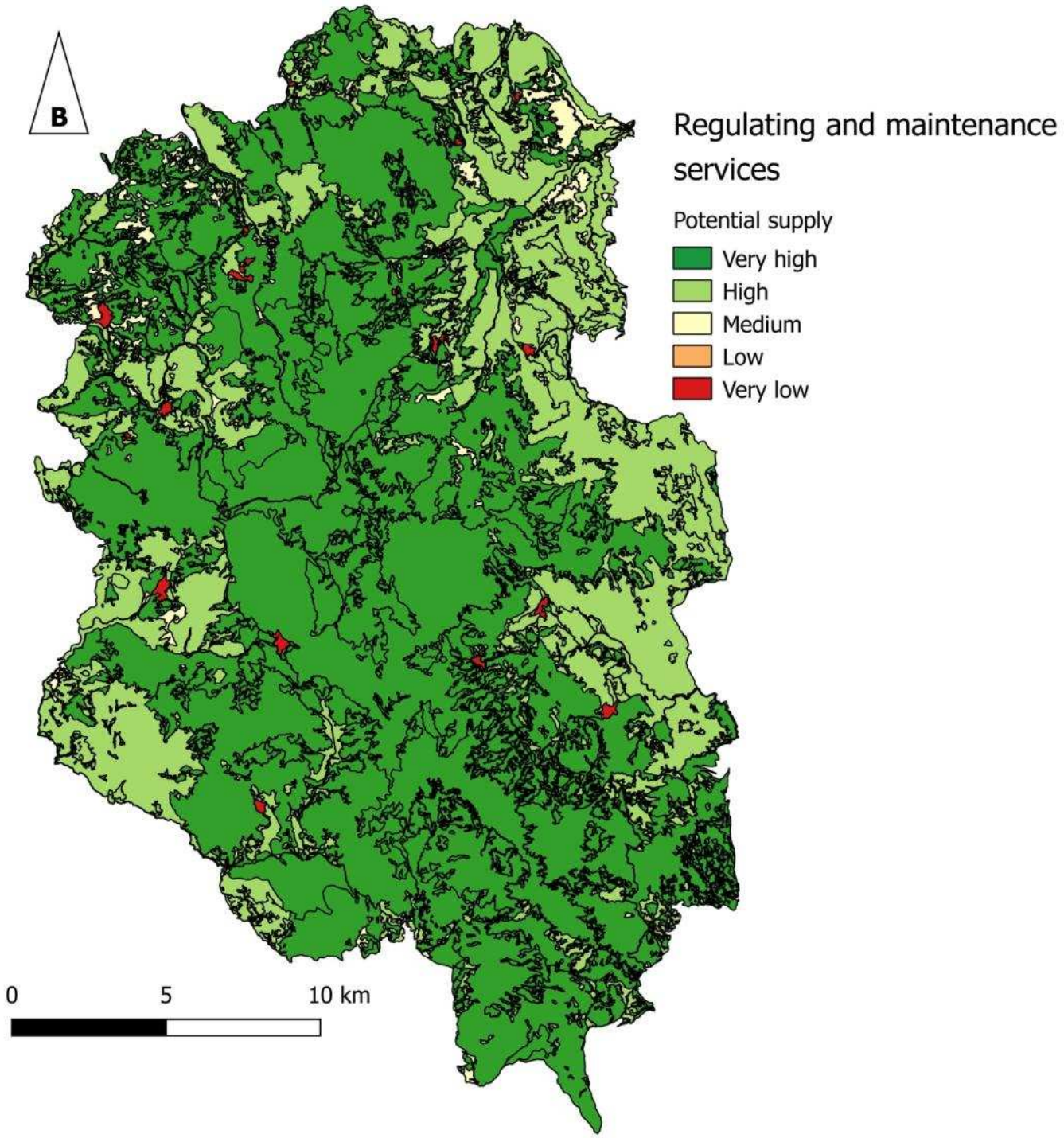


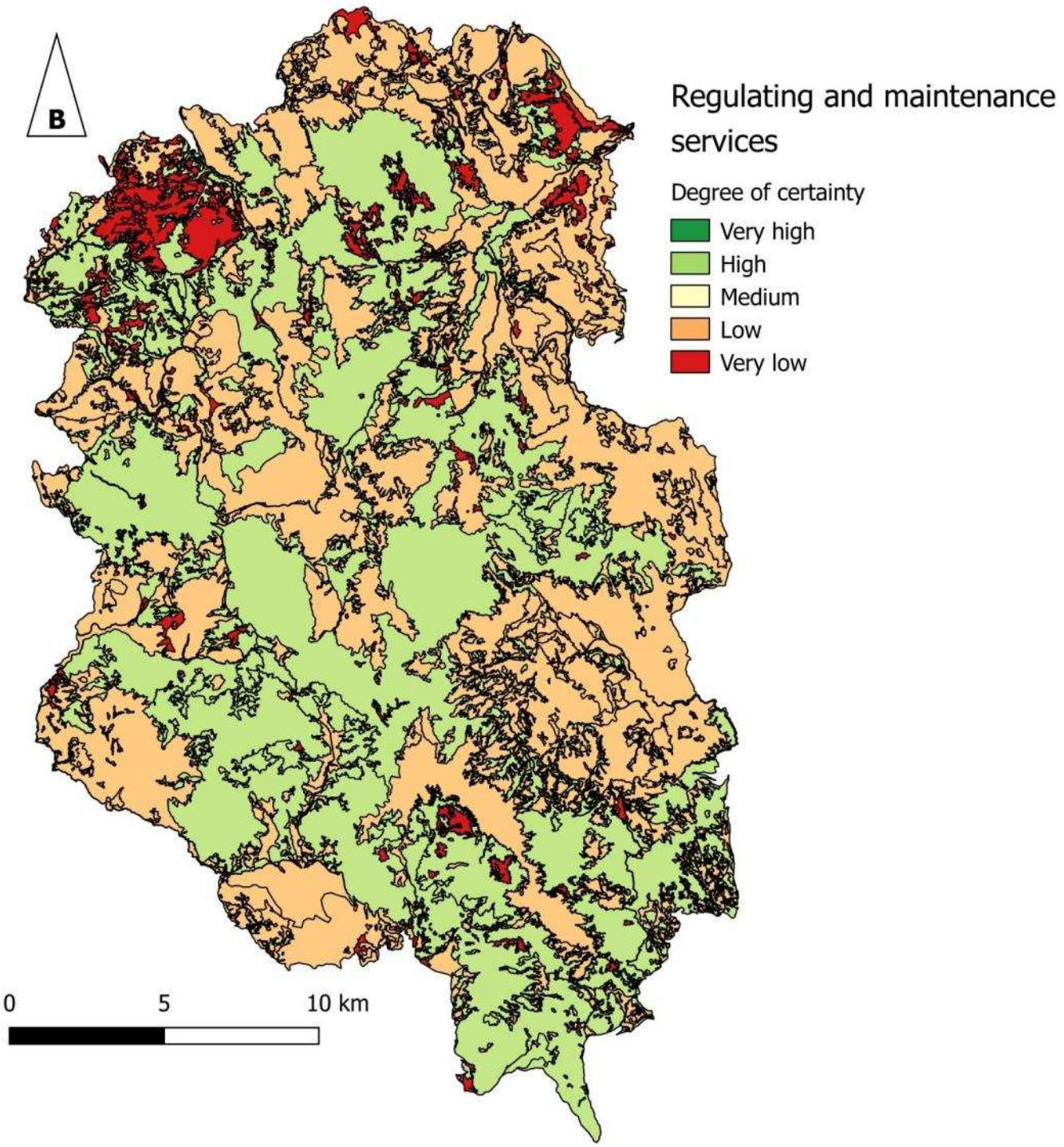
The assessed ES provided by the mountainous Natura 2000 sites (SACs) in Greece considered as **hot spots for total ES supply** (thematic representation of the ES multi-criteria matrix).




B
Provisioning services
Potential supply
Very high
High
Medium
Low
Very low
0
5
10 km


B
Provisioning services
Degree of certainty
Very high
High
Medium
Low
Very low
0
5
10 km


B
Regulating and maintenance services
Potential supply
Very high
High
Medium
Low
Very low
0
5
10 km


B
Regulating and maintenance services
Degree of certainty
Very high
High
Medium
Low
Very low
0
5
10 km









Emphasis on the need to know in detail in EU

where we have what and
where we need what