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## **Action D1: Monitoring programme for conservation works**

### **Monitoring of the floristic diversity of Grecian Juniper silvopastoral woodlands of Prespa basin**

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## **Summary**

The report, which was foreseen as deliverable under the signed agreement between the Research and Education Committee of TEI of Thessaly and the Society for the Protection of Prespa, presents the analysis of the floristic diversity of the priority habitat type \*9562 *Grecian Juniper Woods (Juniperetum excelsae)* (GJWs), in the framework of the Preparatory Action D1 *Monitoring program for conservation works* (Project LIFE JunEx). Field data were obtained the period 29 – 30 June and 27 July 2016. Three (3) types of Grecian Juniper silovapstoral Woodlands (GJWs) were distinguished in respect to the canopy density of standing trees, i.e. open canopy stands of juniper with *Buxus* (DM0), dense canopy mixed stands with *Carpinus* (DM1), and (c) very dense canopy mixed stands with different broadleaf species (DM2). A total of 121 plant taxa were recorded and distributed in 33 botanical families, with legumes being the largest (Leguminosae, 26 taxa). Most plant taxa are sub-Mediterranean (smed, 27%), hemicryptophytes (H, 47%) and scapose (scap, 56%). The statistically predicted richness of plant taxa for DM0 GJWs is 105.4 taxa, for DM1 GJWs is 86.8 taxa, and for the DM2 GJWs is 98.8 taxa. The quantitative analysis of  $\alpha$ -diversity indices obtained from the three types of GJWs does not indicate a persistent distinction. This is most likely due to the minimum time distance and effect of grazing. The behavior of the variability among the three types GJWs, as evidenced by the diversity ordering diagram of Renyi, shows that DM0 GJWs presented higher diversity for the whole range of indicators and is followed by DM2 and by far by the DM1. Thinning seems to improve floristic diversity, resulting in increases of plant taxa richness by a double-fold between the years 2013 and 2016. Safer conclusions about the effect of thinning and grazing treatments on shaping the floristic diversity in time will be produced after the next monitoring measurements. Then, a comparative presentation of

the changes of floristic diversity over the three years of recording (base year 2013, first monitoring in 2016, 2nd monitoring in 2017) will be produced.

**Table 1: Plant taxa (genus, species, subspecies) and abundance recorded in the three types of Grecian Juniper Silvopastoral Woodlands (GJWs). Their chorology, biotic and growth forms are also presented.**

A/A	Taxon	Χωρολογία	Βιοτική μορφή	Αυξητική μορφή	DM0	DM1	DM2
	<b>SPERMATOPHYTA</b>						
	<b>GYMNOSPERMAE</b>						
	<b>Cupressaceae</b>						
1	<i>Juniperus excelsa</i> M. Bieb.	osmed-omed	MP	caesp	47	27	40
2	<i>Juniperus oxycedrus</i> L.	smed	NP/MP	caesp/scap	36	22	33
	<b>Ephedraceae</b>						
3	<i>Ephedra foeminea</i> Forsskal	omed	NP/Ch	caesp/frut	5	3	0
	<b>ANGIOSPERMAE</b>						
	<b>DICOTYLEDONES</b>						
	<b>Aceraceae</b>						
4	<i>Acer campestre</i> L.	smed	MP	caesp/scap	0	0	3
5	<i>Acer monspessulanum</i> L.	endemic / balc-it	MP/NP	scap/caesp	5	3	16
6	<i>Acer obtusatum</i> Willd.	endemic / balc-it	MP/NP	scap/caesp	0	0	3
	<b>Betulaceae</b>						
7	<i>Carpinus orientalis</i> Mill.	med(o)	NP	caesp(scap)	6	26	25
8	<i>Ostrya carpinifolia</i> Scop.	smed	MP	caesp/scap	5	0	0
	<b>Buxaceae</b>						
9	<i>Buxus sempervirens</i> L.	smed	NP	caesp(scap)	41	6	0
	<b>Campanulaceae</b>						
10	<i>Campanula spatulata</i> Sm.	endemic / balc (al, ju, gr)	H	scap	6	9	4
	<b>Caprifoliaceae</b>						
11	<i>Scabiosa webbiana</i> D.Don	endemic / balc	H	scap	0	3	7
12	<i>Lonicera etrusca</i> G. Santi	med-smed	MP	lian	2	0	7
	<b>Caryophyllaceae</b>						
13	<i>Arenaria leptoclados</i> (Reichenb.) Guss.	smed	T	scap	2	0	0
14	<i>Cerastium brachypetalum</i> Pers.	smed	T	scap	7	0	5
15	<i>Minuartia cf verna</i>				11	3	0
16	<i>Silene graeca</i> Boiss. & Spruner	endemic / balc	H	ros	11	3	3
17	<i>Silene italica</i> (L.) Pers.	euras	H	scap	0	3	2
18	<i>Silene vulgaris</i> (Moench) Garcke	euras	H(Ch)	scap	2	9	6
	<b>Cistaceae</b>						
19	<i>Helianthemum nummularium</i> (L.) Miller	euras	Ch	suffr	14	6	8
	<b>Compositae</b>						
20	<i>Centaurea affinis</i> Friv.	balk	H	scap	2	0	0
21	<i>Centaurea</i> sp.				0	0	2

22	<i>Cota tinctoria</i> (L.) J. Gay	euras(kont)-smed	H(Ch)	scap(suffr)	0	0	2
23	<i>Crupina vulgaris</i> Cass.	smed	T	scap	13	9	3
24	<i>Xeranthemum annuum</i> L.	omed-osmed	T	scap	8	0	4
25	<i>Hieracium</i> sp.				2	0	0
26	<i>Hieracium bauhini</i> Schult.	euras	H	scap	0	0	3
27	<i>Hieracium hoppeanum</i> Schult.	euras	H	scap	0	0	3
28	<i>Hieracium murorum</i> L.	euras	H	scap	2	0	0
29	<i>Leontodon cichoriaceus</i> (Ten.) Sanguinetti	med	H	ros	0	0	2
	<b>Convolvulaceae</b>						
30	<i>Convolvulus althaeoides</i> L.	med	H	scand	2	0	0
	<b>Cornaceae</b>						
31	<i>Cornus mas</i> L.	osmed	MNP	caesp/scap	0	3	15
	<b>Crassulaceae</b>						
32	<i>Sedum</i> sp1.				13	3	2
33	<i>Sedum tenuifolium</i> Sibthorp & Smith	med	Ch	caesp	2	0	0
	<b>Cruciferae</b>						
34	<i>Aethionema saxatile</i> (L.) R.Br.	smed-prealp	Ch	suffr	2	6	0
35	<i>Arabis hirsuta</i> (L.) Scop.	smed	H	scap	6	0	0
36	<i>Arabis turrita</i> L.	smed	H	scap	2	0	0
37	<i>Erysimum microstylum</i> Hausskn.	endemic / balc (al-ju-gr)	H	scap	3	3	0
	<b>Euphorbiaceae</b>						
38	<i>Euphorbia myrsinites</i> L.	med-kont	Ch	rept	8	2	2
	<b>Fagaceae</b>						
39	<i>Quercus cerris</i> L.	osmed	MP	scap	0	0	36
40	<i>Quercus pubescens</i> Willd.	smed	MP	caesp/scap	5	3	24
41	<i>Quercus trojana</i> Webb.	endemic / balc-it-an	MP	scap	3	0	7
	<b>Geraniaceae</b>						
42	<i>Geranium brutium</i> Gasp.	sub-balk	T	scap	0	0	2
	<b>Hypericaceae</b>						
43	<i>Hypericum rumeliacum</i> Boiss.	endemic / balc	H	scap	4	0	0
	<b>Labiatae</b>						
44	<i>Acinos suaveolens</i> (Sm.) G. Don fil.	med	H	scap	3	0	0
45	<i>Prunella laciniata</i> (L.) L.	smed	H	scap	1	0	6
46	<i>Teucrium chamaedrys</i> L.	smed-med	Ch	suffr	6	6	7
47	<i>Thymus longicaulis</i> C. Presl	smed	Ch	suffr	16	6	3
	<b>Leguminosae</b>						
48	<i>Anthyllis vulneraria</i> L.	smed-subatl	H(T)	scap	27	9	6
49	<i>Dorycnium herbaceum</i> Vill.	omed-smed	Ch	suffr	0	0	16
50	<i>Hippocrepis emerus</i> (L.) Lassen	euras-smed	NP	scap	27	5	0
51	<i>Lathyrus laxiflorus</i> (Desf.) O. Kuntze	europkont	H	scap	0	3	11
52	<i>Lathyrus</i> sp.				0	0	2
53	<i>Medicago arabica</i> (L.) Hudson	med-atl	T	scap	3	0	0
54	<i>Medicago minima</i> (L.) Bartal.	med-smed	T	scap	8	0	0
55	<i>Melilotus cf indicus</i>				4	5	8

56	<i>Onobrychis alba</i> (Waldst. & Kit.) Desv.	smed	H	scap	3	0	0
57	<i>Ononis reclinata</i> L.	med-kont	T	scap	7	3	9
58	<i>Trifolium alpestre</i> L.	gemabkont-smed	H	scap	0	0	3
59	<i>Trifolium angustifolium</i> L.	smed-subatl	T	scap	0	6	0
60	<i>Trifolium arvense</i> L.	eurassubozean-smed	T	scap	13	3	3
61	<i>Trifolium campestre</i> Schreber	smed-subatl	T	scap	14	3	8
62	<i>Trifolium fragiferum</i> L.	med-smed(gemabkont)	H	rept	4	3	11
63	<i>Trifolium grandiflorum</i> Schreb.	omed	T	scap	11	12	0
64	<i>Trifolium medium</i> L.	smed	G	rhiz	2	3	5
65	<i>Trifolium nigrescens</i> Viv.	med-smed	T	scap	0	0	3
66	<i>Trifolium ochroleucon</i> Hudson	smed-subatl	H	caesp	0	0	4
67	<i>Trifolium pignatii</i> Fauche & Chaub.	endemic / balc	G	rhiz	3	0	0
68	<i>Trifolium scabrum</i> L.	med-smed(subatl)	T	rept-scap	14	3	0
69	<i>Vicia dalmatica</i> A.Kern.	smed	H	scap	0	0	2
70	<i>Vicia grandiflora</i> Scop.	osmed	H	scap	0	3	0
71	<i>Vicia lathyroides</i> L.	(med)smed-subatl	T	scap	0	0	1
72	<i>Vicia tetrasperma</i> (L.) Schreb.	smed-eurassubozean	T	scap	3	0	0
73	<i>Vicia villosa</i> Roth	osmed(gemabkont)	T(H)	scap	0	0	5
	<b>Oleaceae</b>						
74	<i>Fraxinus ornus</i> L.	osmed	MP	scap(caesp)	28	0	8
	<b>Plantaginaceae</b>						
75	<i>Linaria peloponnesiaca</i> Boiss. & Heldr.	endemic / al-ju	H	scap	2	0	0
76	<i>Plantago lanceolata</i> L.	eurassubozean, circ	H	ros	0	3	0
77	<i>Veronica chamaedrys</i> L.	eurassubozean	H	scap	2	6	5
	<b>Ranunculaceae</b>						
78	<i>Clematis vitalba</i> L.	smed-subatl(circ)	NP	lian	0	0	2
79	<i>Thalictrum minus</i> L.	euras-smed	H	scap	0	0	2
80	<i>Helleborus cyclophyllus</i> Bois.	balc	G	rhiz	0	3	7
	<b>Rosaceae</b>						
81	<i>Aremonia agrimonoides</i> (L.) DC.	osmed	H	scap	0	3	10
82	<i>Potentilla recta</i> L.	omed-kont	H	scap	0	0	10
83	<i>Prunus cocomilia</i> Ten.	osmed	NP	scap/caesp	0	0	1
84	<i>Prunus webbii</i> (Spach) Vierh.	endemic / balc-an	NP	caesp	0	2	0
85	<i>Pyrus spinosa</i> Forssk.	med	N(M)P	scap	0	0	3
86	<i>Rosa canina</i> L.	eurassubozean-smed	NP	caesp	0	3	7
87	<i>Sanguisorba minor</i> Scop.	euras	H	scap	0	6	3
88	<i>Fragaria vesca</i> L.	no-euras(subozean)	H	rept	0	6	15
	<b>Rubiaceae</b>						
89	<i>Crucianella angustifolia</i> L.	smed	T	scap	7	6	0
90	<i>Cruciata laevipes</i> Opiz.	smed-eurassubozean	H	scap	0	3	5
91	<i>Galium divaricatum</i> Lam.	med	T	scap	2	0	0
92	<i>Galium mollugo</i> L.	euras	H	scap	4	9	9
	<b>Santalaceae</b>						
93	<i>Arceuthobium oxycedri</i> (DC.) M. Bieb.	euras-smed	NP	ep	5	0	2

	<b>Umbelliferae</b>						
94	<i>Bupleurum</i> sp.				9	9	0
95	<i>Eryngium campestre</i> L.	med-smed	H	scap	0	3	0
96	<i>Ferulago sylvatica</i> (Besser) Reichenb.	osmed-europkont	H	scap	0	0	3
97	<i>Orlaya grandiflora</i> (L.) Hoffm.	med-smed	T	scap	9	3	0
	<b>Violaceae</b>						
98	<i>Viola alba</i> Besser	euras	H	scap	0	0	2
	<b>MONOCOTYLEDONES</b>						
	<b>Amaryllidaceae</b>						
99	<i>Allium</i> sp.				2	0	0
	<b>Asparagaceae</b>						
100	<i>Asparagus acutifolius</i> L.	europ-W asiat(pontico)	G	rhiz	3	0	0
101	<i>Muscari neglectum</i> Guss.	med-smed	G	bulb	2	0	0
102	<i>Ruscus aculeatus</i> L.	smed	G/Ch	rhiz/frut	8	0	0
	<b>Cyperaceae</b>						
103	<i>Carex divulsa</i> Stokes	euras	H	caesp	0	0	2
104	<i>Carex kitaibeliana</i> Degen ex Bech.	smed	H	caesp	0	3	0
	<b>Graminae</b>						
105	<i>Anthoxanthum ovatum</i> Lag.	med	T	scap	8	0	0
106	<i>Brachypodium sylvaticum</i> (Hudson) P. Beauv.	euras(subocean)-smed	H	caesp	0	3	21
107	<i>Bromus cappadocicus</i> Boiss. & Balansa	osmed	H	caesp	9	0	0
108	<i>Bromus squarrosus</i> L.	med-kont	T	scap	0	0	3
109	<i>Cynosurus effusus</i> Link	med	T	scap	3	3	6
110	<i>Dactylis glomerata</i> L.	eurassuboean-smed	H	caesp	17	11	14
111	<i>Elymus</i> sp.				2	0	9
112	<i>Festuca valesiaca</i> Schlechter	kont-med	H	caesp	23	3	6
113	<i>Koeleria cristata</i> (L.) Presl.	smed-europkont	H	caesp	9	3	0
114	<i>Melica ciliata</i> L.	smed	H	caesp	18	3	0
115	<i>Melica uniflora</i> Retz.	subatl(smed)	H	caesp	2	0	7
116	<i>Phleum pratense</i> L.	no-euras	H	caesp	3	0	8
117	<i>Poa bulbosa</i> L.	med-smed(kont)	H	caesp	39	3	0
118	<i>Stipa bromoides</i> (L.) Dorfler	med	H	caesp	10	3	0
119	<i>Stipa pennata</i> L.	euras	H	caesp	6	0	0
120	<i>Vulpia muralis</i> (Kunth) Nees	med	T	scap	2	0	0
	<b>Iridaceae</b>						
121	<i>Iris attica</i> Boiss. & Heldr.	endemic / balc(ju-gr)-an	G	rhiz	13	3	0