EDGG Event

DOI: 10.21570/EDGG.PG.38.12-24

Report on the 15th Eurasian Grassland Conference in Sulmona, Italy

The 2018 Eurasian Grassland Conference "Cooperating for Grassland Conservation" (EGC 2018) took place from 4th to 8th June 2018 in the town of Sulmona, located in the centre of the Apennines in the Majella National Park. It was jointly organised by the University of Rome La Sapienza and the Majella National Park.

This was the 10th conference of the EDGG, despite the official numbering includes the predecessor conferences of the AG Trockenrasen. The main topic of the conference was the conservation of grasslands through transdisciplinary and transnational cooperation. A total of 59 participants from 18 countries attended the conference, which included two keynote talks, 27 regular talks and 16 posters. The attendance of five participants was made possible with travel grants provided by EDGG/IAVS (see Box 1).

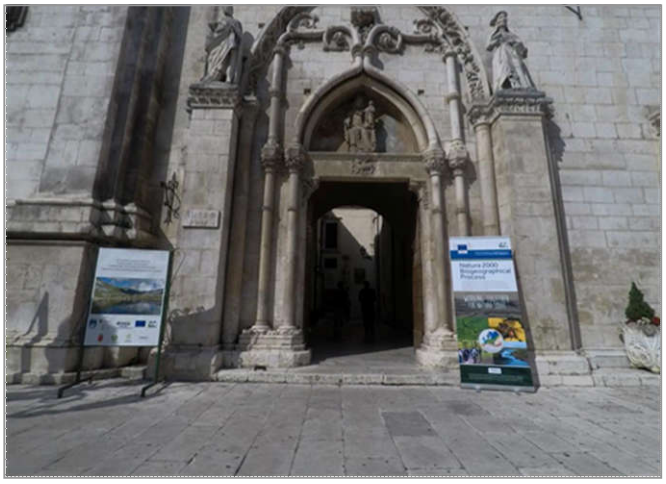
The conference started with a workshop on the main EU funding schemes related to grassland conservation (Interreg Europe and LIFE+) and a welcome drink during which most participants gathered in the town of Sulmona. There was also a workshop on the Natura 2000 Biogeographical Process (see Box 2), and mid-symposium and post-symposium excursions, the latter including a practical demonstration of the standard EDGG biodiversity sampling (see Box 4), as well as the annual General Assembly of the EDGG (see Box 3).

The first day of the conference included three sessions that gave an idea of the issues related to habitat classification and reference values (session 1). The main threats and pressures on which speakers reported were changes in land-use and invasions by non-native species (session 2). Finally some conservation actions (e.g. specific grazing plans, prescribed burning) were proposed during session 3.

On the second day, the excursion gave participants the possibility of looking at different types of regionally typical grasslands, from those dominated by annual species at about 800 m a.s.l. to those in contact with the subalpine *Pinus mugo* formations, and to discuss their current and past management regimes.

The third conference day included a session on conservation priorities, with talks ranging from the gene to the ecosystem levels. During the afternoon, participants moved to the National Park operational center for the knowledge market and for the networking session. The Knowledge market included 16 posters and stands of ongoing LIFE+

The central square of Sulmona with a rainbow during the conference. Photo: S. Burrascano.



Upper left: entrance to the conference venue; upper right: co-organiser Eleonora Giarrizzo giving her talk. Photos: S. Burrascano; lower left: during the lunch break; lower right: Stephen Venn and Pietro Brandmayr enjoying their lunch. Photos: J. Dengler.

Trek of the participants in montane grasslands. Photo: S. Burrascano.

Picnic in a cattle pasture. Photo left: J. Dengler; right: S. Burrascano.

Jürgen Dengler taking photos (left) and Pietro Brandmayr and Stephen Venn collecting carabids (right). Photos: N. Polchaninova.

projects and of local farmers. The networking session included a plenary introduction, after which participants were split up into four working groups, with each group reporting on the main ideas contributed to the topics of the conference (Box 2).

The evening session comprised the annual General Assembly of EDGG, during which the EDGG chairs presented past and forthcoming activities of the working group (see Minutes in Box 3) and thanked the organisers of the EGC-2018 in Sulmona for this wonderful event. Also, as is customary, prizes were awarded for the best oral and poster presentations of young investigators. According to the 5-member jury, the best oral presentation was that of Ludovica Oddi, who presented "*Functional biodiversity is the key point of the interaction between climate and land-use change in a subalpine grassland*", jointly prepared by L. Oddi, E. Cremonese, G. Filippa, M. Galvagno, U. Morra Di Cella and C. Siniscalco. The second best prize went to Eugen Görzen for the talk "*Burning and restoration from the seed bank – Conservation perspectives for dry basiphilous grassland in Transylvania (Romania)*", prepared by E. Görzen, K. Boris-

During the General Assembly, Nataša Pipenbaher and Sonja Škornik presented the proposal for the EGC-2019, jointly hosted in Styria (Austria) and Slovenia. Photo: J. Dengler.

Mike Vrahnakis, EDGG's Conference Coordinator, awards the winner of the best oral presentation, Ludovica Oddi, and thanks two of the main organisers of the EGC-2018, Sabina Burrascano and Eleonora Giarrizzo. Photos: J. Dengler.

Poster session. Photo: J. Dengler.

Grassland party. Photos: S. Burrascano.

Grassland species of the second excursion, left: *Ophrys lucana* right: *Aporia crataegi*. Photos: G. Ciaschetti (left), J. Dengler (right).

Group photo on the crest above the glacial amphitheatre near Rifugio Bruno Pomilio at about 2100 m a.s.l. Photo: S. Burrascano.

ova, A. Fenesi, E. Ruprecht and T.W. Donath. The best poster presentation was determined by the voting of all conference participants, and this award went to Anna Theresa Lehmair, who presented "*Genetic conservation areas – A new approach to protect both species and genetic diversity of litter meadows*", jointly prepared by A.T. Lehmair, E. Pagel, P. Poschlod and C. Reisch. The second best prize went to Sven Rubanschi, for the poster "*The impact of historical land use on the creation of sandy grasslands*", prepared by S. Rubanschi and P. Poschlod.

This day was the richest in emotions and ended with the grassland party, with traditional food and music in the welcoming court of the National Park operational centre.

The second excursion gave the participants the possibility of enjoying one of the widest and richest grassland slopes in the National Park and to perform a sample according to the standardized GrassPlot protocol (Box 4).

Sabina Burrascano (sabina.burrascano@uniroma1.it)
Giampiero Ciaschetti
(giampiero.ciaschetti@parcomajella.it)
Michael Vrahnakis (mvrahnak@teilar.gr)
Jürgen Dengler (juergen.dengler@uni-bayreuth.de)

Box 1. Impressions from the IAVS Travel Grantees

Thanks to the IAVS and its Global Sponsorship Committee, EDGG could support the participation of five scientists in the EGC-2018 in Sulmona. Here they report their impressions.

Alla Aleksanyan, Armenia (alla.alexanyan@gmail.com)

For scientists and especially young scientists working with grasslands this conference is a great opportunity for presenting ongoing research, sharing experience and getting valuable feedback from colleagues of all over the world. From other side you will have opportunity and enlarge your network, start new collaboration, sometimes find new areas for future research. This is all I got from my participation in 15th Eurasian Grassland Conference "COOPERATING FOR GRASSLAND CONSERVATION".

I would like to thank Executive Committee of EDGG for given opportunity and financial support to participate in 15th Eurasian Grassland Conference.

I want to mention that the program was very intensive and interesting, but I think that the Networking event of the Natura 2000 Biogeographical process could be separate event, because participants were from different areas and not all of them were aware about details of Natura 2000 Biogeographical process and time for such important discussion was too short.

I found very useful post-conference excursion for me and I think for other participants who would like to learn the EDGG sampling methodology. But I think for the next time organizers could offer two options for participants who already know this methodology or are not very interested on it.

And of course I enjoyed all presentations from keynote speakers, which gave me chance to have broad-scale view on current international challenges and tendencies of different research in grasslands.

Valentina Borodulina, Russia
(valentinka_bo@mail.ru)

I am grateful to EDGG for the opportunity to participate in the conference. The conference in Sulmona was my third EDGG conference. It was nice to meet old friends and new ones. Also, I was really impressed by the venue of the conference: Sulmona is very beautiful and cozy place.

The conference EGC 2018 was the perfect place to present the continuation of our work dedicated to abandoned grasslands in NW Russia. In recent decades without agricultural use grassland areas decrease and become overgrown with forest and Russian grasslands are no exception. Due to this the conference section «Grassland threats and pressures» was of particular interest for me. During the conference I was able to communicate with scientists from other countries and to find common topics for discussion. Besides EGC 2018 was an excellent opportunity for collaboration not only with botanists but also with experts in other fields (for example, GIS specialists and conservation area experts). Poster session was very entertaining and informative. Unfortunately, it seemed to me that there was not enough time for the poster session. Nevertheless, I got feedback on my study and recommendations for further researches during the poster session.

Another point was that I had a great opportunity to participate in the session: “Cooperating for grasslands”. During this session we were working in groups and addressed some subtopics to brainstorm transnational cooperation projects within the EDGG.

In addition, I would like to thank the staff of the Majella National Park and local organizers of EGC 2018 for a delightful mid-conference excursion with interesting talks and magnificent views.

Thank you all for the wonderful conference!

Eugen Görzen, Germany (egoerzen@ecology.uni-kiel.de)

I am very thankful to the EDGG and IAVS grant committee for the travel support and the opportunity to participate in the 15th Eurasian Grassland Conference 2018 in Sulmona. The EGC 2018 was the second EDGG conference (after EGC 2016 in Sighișoara in 2016) I attended and I was happy to meet and exchange with many grassland experts from the EDGG community and to see familiar faces from Sighișoara again. As expected, the atmosphere at the EGC was relaxed and professional at the same time. The venue in the ancient town of Sulmona was lovely and I enjoyed the mid-conference excursion to the grasslands in the Majella National Park very much. It was fascinating to learn and to see how management, management changes and abandonment have shaped the appearance and plant species composition of these grasslands.
During the oral sessions, I had the opportunity to present parts of my PhD-research on woody species encroachment and fire management to halt secondary succession in Transylvanian grassland to the EDGG community. Nowadays, the expansion of shrubs and trees is a threat to biodiversity in many Palaearctic grassland ecosystems, and burning as a management tool to limit woody species encroachment is under controversial debate. Therefore, I was pleased to receive feedback from and exchange experiences with colleagues who have expert knowledge on shrub encroachment and fire management from other Eurasian grasslands. I like the spirit at Eurasian Grassland Conferences very much because all participants cooperate in order to contribute to grassland conservation and restoration in the Palaearctic realm. I want to thank the organizers for the great conference and I am looking forward to the next EGC and other EDGG events!

Oleksii Kovalenko, Ukraine (corydalis@ukr.net)

I would like to say a great thanks to the IAVS and EDGG for supporting my participation on the 2018 Eurasian Grassland Conference held on June 4–8, 2018. The conference was organized by the Eurasian Dry Grassland Group, the International Association for Vegetation Science, Sapienza University of Rome, Majella National Park and Società Botanica Italiana. There were four main topics of the presentations at the conference: habitat classification and indicators of conservation status, grasslands threats and pressures, conservation goals and appropriate measures and setting conservation priorities. On the special workshop “Cooperating for grasslands” a number of issues related to the interpretation of habitats, monitoring programs, conservation measures, that need to be solved, was revealed and discussed.
It was a great experience for me. I have got a lot of new ideas about my future work and inspiration for it. I participated in both excursions. I saw a number of beautiful semi-natural grassland communities from Italy and took part in a great team work of making of EDGG Biodiversity Plots. The conference location seemed extraordinary appealing to me, due to its amazing setting in the historic old town of Sulmona. In general, the work of the conference was extremely informative and interesting, covering a wide range of fundamental and applied issues concerning the structure, functioning and conservation of grassland ecosystems. Special thanks go to the conference organizers who resolved all the problems and made all days of conference unforgettable.

Nina Polchaninova, Ukraine (polchaninova_n@ukr.net)

I am very thankful to the Grant Committee for the opportunity to take part in the conference. As always, many questions worth to think about were raised and discussed. It was clearly seen that we are facing the same problems in various geographic regions and countries: changing of traditional management, pasture abandonment vs. overgrazing, difficulties in the organizing of multi-taxon studies, etc. A challenging task is to make ecologically friendly farming profitable for local farmers and involve them in the conservation programs. Live communication with colleagues and gained experience will help me to implement new ideas in the conservation of Ukrainian steppes.
The mid-conference excursion opened me new landscapes and grassland diversity. The history of local husbandry and the program of Majella Park for the wolf protection as well as cooperation with local farmers was very interesting and illustrative. Besides, the town of Sulmona, its confetti, cheese and Italian cuisine made the conference unforgettable.

Box 2. Workshop on the Natura 2000 Biogeographical Process

The EU Biodiversity Strategy calls for significant improvements in the conservation status of species and habitats protected under the EU Birds and Habitats Directives by 2020. To help meeting this target, the European Commission launched in 2012 the Natura 2000 Biogeographical Process, a multi-stakeholders' co-operation process at the biogeographical level, including seminars, workshops and cooperation activities to enhance effective implementation, management, monitoring, financing and reporting of the Natura 2000 network. Since 2012, ten Natura 2000 biogeographical Seminars have been organized. One of these networking events was the workshop 'Cooperating for Grassland conservation'.

Almost 50 experts participated in the workshop in the last session of the EGC. The workshop was organized by the team from the Biogeographical Process which consisted of Theo van der Sluis (project leader), Carlos Sunyer and Lola Manteiga (Terra Ecogest Spain), Javier Cabello (national expert, University of Almeria) and Jan Sliva (monitor LIFE projects, NEEMO).

In four different groups, themes were discussed that had been central to most of the presentations and the excursion of the previous days:

- Habitat definition and interpretation
- Favourable reference values
- Action plans for habitat conservation at biogeographical level
- Grassland conservation, EU-funding and cohesion policy

The four groups discussed the experiences in the different member states, practical approaches and solutions for the observed issues and problems, and based on that what practical steps and cooperative action would be needed to come to a solution, also giving rise to new ideas and approaches.

The results from the workshop will be used to support the Road Map for the Mediterranean biogeographical region, and because they are related to recurring problems also in other biogeographic regions, this should lead to new initiatives aiming at implementing measures or initiatives that will support the establishment and enhancement of the Natura 2000 network.

The Biogeographical process stimulated the exchange of knowledge and sharing best practices through the knowledge market. At the poster session, contributions on research as well as projects funded by the LIFE+ program were presented. There was also a stand from one of the grassland habitat managers, a shepherd presenting the products from his farm which included wool products, sausage and cheese as well as promotion products.

The workshop report can be found at the Platform webpage. The results of the workshop can be used as an opening for the discussion in the next EGC in Graz, 2019.

Theo van der Sluis (theo.vandersluis@wur.nl)

Introduction to the Natura 2000 Biogeographical Process workshop (Photo: S. Burrascano) and two thematic discussion rounds (Photo: T. van der Sluis).

Box 3. Minutes from the General Assembly

The General Assembly (GA) of the EDGG was held in Sulmona, Italy, on 7th June, at the end of the 15th Eurasian Grassland Conference (EGC). This GA was a Qualified GA, as it fulfilled the criteria of being attended by at least 40 members from at least 10 different countries, with no country being represented by more than a third of those present (EDGG Bylaws § 5.4). The Executive Committee was represented by Jürgen Dengler, Mike Vrahnakis and Stephen Venn.

The Secretary-General opened the GA at 6:00 p.m. The main purpose of the GA is to publicly review the activities of the organization, as managed by the Executive Committee (EC), during the period 2017-2018. The first topic was the status of the membership, prepared by Idoia Biurrun, and currently EDGG has 1272 members from 67 countries. The financial report, prepared by Péter Török, showed a current balance of €961.15. The EDGG does not currently have other income than the baseline funding of €500 per annum from the IAVS, and other grants and occasional project funding from the IAVS. The ongoing project to update and reinvigorate the EDGG website has used a considerable proportion of the project funding and lack of available funding is restricting progress with the website project. Therefore, the EC has been considering possible ways of attracting additional funding, such as the marketing of T-shirts, canvas bags, etc. This presentation was closed with an invitation to members to help with suggestions for fundraising activities. We are still happy to receive such suggestions and they can be sent to Péter or any other members of the EC.

The next topic on the agenda was a report on the Eurasian Grassland Conferences, prepared by Didem Ambarli and Mike Vrahnakis. The 16th Eurasian Grassland Conference will be jointly held in Austria and Slovenia, 29.5-05.06.2019, and this was presented by Nataša Pipenbaher and Sonja Škornik. The organizers will be the Institute of Biology, Department of Plant Sciences, University of Graz, Austria and the Department of Biology, University of Maribor, Slovenia. Proposals for future EGCs include 2020 or 2021 Bilbao, Spain (Idoia Biurrun), and possibly Morocco (Claudio Porqueddu) and Lanzhou City, Gansu Province, China (Prof. Dr. Zhan-Huan Shang). Other proposals for future conferences, as well as for how to improve the conferences, are also very welcome, as announced in the GA.

Jürgen Dengler presented an overview of the Field Workshops over the previous nine years. The 11th Field Workshop in 2018 was held in the Inner-Alpine valleys of Austria during 6-13th July 2018. The 12th Field Workshop will be held in Armenia in 2019. Further details will be published in *Palaearctic Grasslands*. A number of venues have been proposed for subsequent field workshops, including Italy, Spain, Poland, Bosnia and Herzegovina, Montenegro and Central Asia. Data from the workshops have been collated in the GrassPlot repository, which now contains 126 datasets with 168.997 plots from 35 countries.

Stephen Venn presented a report prepared by Didem Ambarli on the reconstruction of the EDGG homepage. There is now a demonstration version of the proposed new homepage, with sections managed by each of the chairs. We hope to begin testing this version online soon. The web sites for the future EGC conferences will be incorporated into the new EDGG homepage. However, this is also a topic in which we would very much like to get help from any of the members. If anyone has experience/skills/willingness to help us improve and manage the web page, then please contact Didem.

Jürgen Dengler presented a report prepared by Anna Kuzemko, Idoia Biurrun and himself on the Bulletin. There have been two issues of the *EDGG Bulletin* during the reporting period, issues 35 and 36. The next editions will be titled *Palaearctic Grasslands*, instead of the Bulletin. This new format will have a larger editorial team, have a broader scope, and we believe it will be more attractive for both readers and authors. Anna continues as the Chief Editor, now supported by Idoia and Jürgen as Deputy Chief Editors.

Other EDGG publications, presented by Jürgen and Péter, comprised the 12th EDGG SF in *Tuexenia* 37, the fourth SI in *Hacquetia* 37, and the 13th SF to be published in *Tuexenia* 38 during 2018. The book *Grasslands of the World: Diversity, Management and Conservation* (Squires, Dengler, Feng & Hua, eds., 2018), containing eight chapters edited by EDGG members, will be published in 2018. There is currently an open call for papers for the 14th EDGG SF in *Tuexenia*, on the topic of flora, vegetation and conservation of Central European grasslands. Abstracts should be submitted for consideration to Balázs Deák (for details, see updated call in this issue).

The Secretary-General closed the General Assembly at 7:30 p.m.

Secretary-General ***Stephen Venn***
(stephen.venn@helsinki.fi)

Box 4. Demonstration of an EDGG Biodiversity Plot in San Nicola on 8 June 2018

In his keynote lecture, Jürgen Dengler had introduced the standardised EDGG biodiversity sampling methodology used in the annual EDGG Field Workshops (Dengler et al. 2016b), as well as the GrassPlot database of EDGG, which collects and provides such multi-scale plant diversity data from Palaearctic grasslands (Dengler et al. 2018). The post-symposium excursion offered an ideal opportunity for a practical demonstration of the so-called EDGG Biodiversity Plot (Dengler et al. 2016b) in a diverse limestone grassland. As usual, a relatively homogenous 100-m² square plot was delimited in two opposite corners, of which subseries of nested plots from 0.0001 m² (1 cm²) to 10 m² were arranged in a nested manner. For the sake of expedience, this time exceptionally only vascular plants were recorded (with the shoot presence system, while the (relatively few) terricolous bryophytes and lichens were disregarded). The explanation of the method and the careful and complete demonstration required about 2 hours.

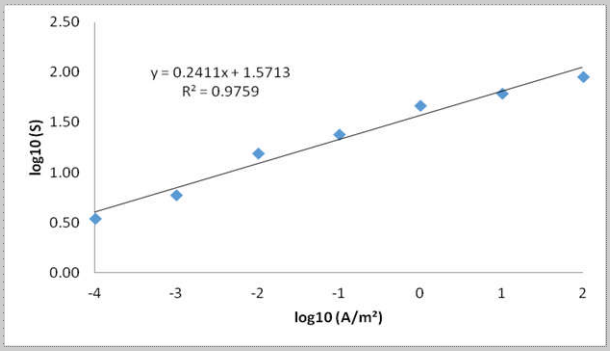
The sampling was conducted in the Majella National Park (Italy: Chieti province: Palena municipality: San Nicola) in a pasture grazed by sheep and to a small extent cows. The centroid of the plot was located approximately at 41.99194° North, 14.11333° East at 1171 m a.s.l. (precision: 20 m). The syntaxonomic assignments of the stands according to the Italian national system (*Festuco-Brometea*: *Phleo ambigui-Brometalia erecti*: *Phleo ambigui-Bromion erecti*; Biondi et al. 2014) and the EuroVeg-Checklist (*Festuco hystricis-Ononidetea striatae*: *Erysimo-Jurineetalia bocconei*: *Cystiso spinescentis-Bromion erecti*; Mucina et al. 2016) differ strongly, indicating that a data-based classification of Italian dry grasslands in the supra-national context would be desirable to reach a common solution.

The resulting species-area relationship closely followed the power law $S = c\,A^{z}$ or $\log S = \log c + z \log A$, with S = species richness and A = area (in m²) and c and z estimated function parameters (see Figure). The slope parameter z was relatively high at 0.24, indicating a significant small-scale species turnover. With a richness of 91 vascular plant species in 100 m² and a maximum richness of 70 vascular plant species in 10 m², the plots are quite diverse, albeit at only about 70% of the European maxima in that types of grasslands (Dengler et al. 2016a).

Top: The 100-m² plot IT30 (Photo: S. Burrascano); bottom: one of the two 1-m² subplots (Photo: J. Dengler).

Header data

	IT30NE	IT30SW
Aspect (°)	150	120
Slope (°)	14	24
Max. vegetation height (m)	0.85	0.70
Vegetation total (%)	95	90
Tree layer (%)	0	0
Shrub layer (%)	0	0
Herb layer (%)	95	90
Cryptogam layer (%)	1	2
Litter (%)	20	50
Dead wood (%)	0	0
Stones and rocks (%)	0.5	0.2
Gravel (%)	0	3.8
Fine soil (%)	99.5	96



The species-area relationship of the mean richness data of vascular plants in double-log space.

Vegetation relevés (Plant nomenclature is according to Bartolucci et al. 2018; cover values for 10-m² plots are in %)

Plot ID	IT30NE	IT30NE	IT30NE	IT30NE	IT30NE	IT30NE	IT30SW	IT30SW	IT30SW	IT30SW	IT30SW	IT30SW	IT30x
Area [m²]	**0.0001**	**0.001**	**0.01**	**0.1**	**1**	**10**	**0.0001**	**0.001**	**0.01**	**0.1**	**1**	**10**	**100**
log (Area)	-4.0	-3.0	-2.0	-1.0	0.0	1.0	-4.0	-3.0	-2.0	-1.0	0.0	1.0	2.0
Species richness (vascular plants)	3	6	16	27	50	70	4	6	15	21	43	54	91
Agyrolobium zanonii subsp. *zanonii*	.	.	.	.	.	.	.	.	.	.	x	0.01	x
Anthyllis vulneraria subsp. *rubriflora*	.	.	.	.	x	2	.	.	.	.	x	0.1	x
Arenaria serpyllifolia subsp. *serpyllifolia*	.	.	.	x	x	0.1	.	.	.	.	x	0.1	x
Asperula aristata s.l.	.	.	.	.	.	0.01	.	.	.	.	x	0.1	x
Asperula purpurea	.	.	x	x	x	4	.	.	.	.	x	0.1	x
Astragalus monspessulanus subsp. *monspessulanus*	.	.	.	.	.	2	.	.	.	.	x	1	x
Brachypodium rupestre	.	.	.	.	.	1	.	x	x	x	x	5	x
Bromopsis erecta s.l.	x	x	x	x	x	50	.	.	x	x	x	60	x
Bupleurum baldense	.	.	.	x	x	0.5	.	.	.	.	x	0.5	x
Carex distachya	.	.	.	.	.	.	.	.	.	.	x	0.3	x
Carex flacca subsp. *erythrostachys*	.	.	.	.	.	.	.	.	.	.	.	.	x
Carex halleriana	.	.	.	.	x	5	.	.	.	.	x	0.1	x
Carlina acanthifolia subsp. *acanthifolia*	.	.	.	.	.	1	.	.	.	.	.	.	x
Catapodium rigidum subsp. *rigidum*	.	.	.	.	.	0.01	.	.	.	.	.	.	x
Centaurea ambigua subsp. *nigra*	.	.	.	x	x	0.5	.	.	.	.	.	0.1	x
Cerastium tomentosum	.	.	x	x	x	5	.	.	.	.	x	0.1	x
Coronilla minima subsp. *minima*	.	.	.	.	x	30	.	.	.	.	x	15	x
Coronilla scorpioides	.	.	.	x	x	2	.	.	.	.	x	0.5	x
Crepis lacera subsp. *lacera*	.	.	.	.	.	.	.	.	.	.	.	.	x
Cuscuta sp.	.	.	.	.	x	0.01	.	.	.	.	.	.	x
Cynosurus cristatus	.	.	.	.	x	2	.	.	.	.	.	.	x
Cynosurus echinatus	.	.	.	.	.	0.5	.	.	.	.	x	0.5	x
Dactylis glomerata subsp. *hispanica*	.	.	x	x	x	3	.	.	.	x	x	2	x
Daucus carota subsp. *carota*	.	.	.	.	.	.	.	.	.	.	.	.	x
Eryngium amethystinum	.	.	x	x	x	2	.	.	.	.	x	0.5	x
Euphrasia stricta	.	x	x	x	x	4	x	x	x	x	x	5	x
Festuca circummediterranea	x	x	x	x	x	15	.	.	x	x	x	15	x
Galium corrudifolium	.	.	.	.	x	2	.	.	.	.	.	0.1	x
Globularia bisnagarica	.	.	.	.	x	3	.	.	.	.	x	0.01	x
Gymnadenia conopsea	.	.	.	.	.	.	.	.	.	.	.	.	x
Helianthemum apenninum subsp. *apenninum*	.	.	.	.	x	0.5	.	.	.	.	.	0.05	x
Helianthemum nummularium subsp. *glabrum*	.	.	.	.	.	0.3	.	.	x	x	x	5	x
Helianthemum oelandicum	.	.	.	.	.	0.2	.	.	.	.	.	.	x
Helianthemum salicifolium	.	.	.	.	.	0.1	.	.	.	.	.	.	x
Helictochloa praetutiana subsp. *praetutiana*	.	.	x	x	x	2	x	x	x	x	x	2	x
Hippocrepis comosa subsp. *comosa*	.	x	x	x	x	1	x	x	x	x	x	1	x
Hypericum perforatum s.l.	.	.	.	.	x	0.5	.	.	.	.	.	0.05	x
Juniperus deltoides	.	.	.	.	.	.	.	.	.	.	.	.	x
Knautia calycina	.	.	.	.	.	0.02	.	.	.	.	.	.	x
Koeleria splendens	.	.	.	.	.	.	.	.	x	x	x	1	x
Leontodon crispus	.	.	.	.	.	0.01	.	.	.	.	x	0.1	x
Leontodon hispidus s.l.	.	.	.	.	.	.	.	.	.	.	x	1	x
Linum strictum	.	.	.	.	.	.	.	.	.	.	x	0.1	x
Linum tenuifolium	.	.	x	x	x	0.2	.	.	x	x	x	0.5	x
Lolium arundinaceum subsp. *arundinaceum*	.	.	.	.	x	0.5	.	.	.	.	.	.	x
Lolium perenne	.	.	.	.	.	.	.	.	.	.	.	.	x
Lomelosia crenata subsp. *pseudisetensis*	.	.	.	.	.	0.1	x	x	x	x	x	1	x
Lotus corniculatus subsp. *corniculatus*	.	.	.	x	x	1	.	.	x	x	x	0.5	x
Lotus herbaceus	.	.	.	.	.	0.2	.	.	.	.	.	0.01	x
Medicago lupulina	.	.	.	.	x	0.2	.	.	.	.	.	.	x
Muscari neglectum	.	.	.	.	x	0.01	.	.	.	.	.	.	x
Odontites luteus subsp. *luteus*	.	.	x	x	x	0.5	.	.	.	.	.	.	x
Onobrychis alba subsp. *alba*	.	.	x	x	x	5	.	.	.	.	x	10	x
Ononis reclinata	.	.	.	x	x	0.2	.	.	.	.	.	.	x
Ononis spinosa s.l.	.	.	.	.	x	0.8	.	.	x	x	x	0.1	x

Plot ID	IT30NE	IT30NE	IT30NE	IT30NE	IT30NE	IT30NE	IT30SW	IT30SW	IT30SW	IT30SW	IT30SW	IT30SW	IT30x
Ononis viscosa subsp. *brevifolia*	.	.	.	.	.	0.01	.	.	.	.	.	.	x
Ophrys dinarica	.	.	.	.	.	.	.	.	.	.	.	.	x
Ophrys lucana	.	.	.	.	.	0.01	.	.	.	.	.	0.001	x
Orobanche sp.	.	.	.	.	.	.	.	.	.	.	.	.	x
Pentanema montanum	.	.	.	.	.	.	.	.	.	.	.	0.01	x
Petrorhagia prolifera	.	.	x	x	x	0.1	.	.	.	.	.	.	x
Petrorhagia saxifraga s.l.	.	.	x	x	x	0.1	.	.	.	.	.	.	x
Phleum hirsutum subsp. *ambiguum*	.	.	.	.	x	1	.	.	.	.	.	0.1	x
Pilosella officinarum	.	.	.	.	x	0.3	.	.	.	.	x	1	x
Pinus nigra subsp. nigra	.	.	.	.	.	.	.	.	.	.	.	.	x
Plantago lanceolata	.	.	.	x	x	1	.	.	x	x	x	0.1	x
Poa compressa	.	.	.	.	.	0.2	.	.	.	.	.	.	x
Polygala nicaeensis s.l.	.	x	x	x	x	1.5	.	.	.	x	x	5	x
Poterium sanguisorba s.l.	.	.	.	x	x	1	.	x	x	x	x	1	x
Prunella laciniata	.	.	.	.	x	1	.	.	.	.	.	.	x
Ranunculus bulbosus	.	.	.	.	.	.	.	.	.	.	.	.	x
Rhinanthus minor	.	.	.	.	.	0.5	.	.	.	.	.	.	x
Sabulina attica	.	.	.	.	x	0.01	.	.	.	.	.	.	x
Scabiosa holosericea	.	.	.	x	x	1	.	.	.	x	x	0.001	x
Seseli montanum subsp. *montanum*	.	.	.	.	.	0.1	.	.	.	.	.	.	x
Sesleria nitida subsp. *nitida*	.	.	.	.	.	3	.	.	.	.	.	.	x
Silene notarisii	.	.	.	.	.	.	.	.	x	x	x	0.1	x
Stachys italica	.	.	.	.	.	.	.	.	.	.	.	.	x
Taraxacum sect. *Erythrosperma*	.	.	.	x	x	0.1	.	.	.	x	x	0.1	x
Teucrium chamaedrys subsp. *chamaedrys*	.	.	.	x	x	1	.	.	.	.	.	0.1	x
Thymus oenipontanus	.	.	.	.	x	0.5	.	.	.	.	.	5	x
Thymus pulegioides	.	.	.	.	x	0.1	.	.	.	.	.	5	x
Trifolium campestre	.	.	.	.	x	0.3	.	.	.	x	x	0.5	x
Trifolium hybridum subsp. *hybridum*	.	.	.	.	x	0.2	.	.	.	.	.	.	x
Trifolium ligusticum	x	x	x	x	x	3	.	.	.	.	.	.	x
Trifolium ochroleucon	.	.	.	.	.	.	.	.	.	.	x	1	x
Trifolium pratense subsp. *pratense*	.	.	.	.	.	.	.	.	.	x	x	1	x
Trifolium scabrum	.	.	.	.	x	0.5	.	.	.	.	x	0.5	x
Trifolium stellatum	.	.	.	.	.	0.2	.	.	.	.	.	.	x
Trigonella sulcata	.	.	.	.	x	0.1	.	.	.	.	.	.	x
Trinia delachampii	.	.	.	.	.	.	.	.	.	.	.	.	x

References

Bartolucci, F., Peruzzi, L., Galasso, G., Albano, A., Alessandrini, A., Ardenghi, N.M.G., Astuti, G., Bacchetta, G., Ballelli, S., (…) & Conti, F. 2018. An updated checklist of the vascular flora native to Italy. *Plant Biosystems* 152: 179–303.

Biondi, E., Blasi, C., Allegrezza, M., Anzellotti, I., Azzella, M.M., Carli, E., Casavecchia, S., Copiz, R., Del Vico, E., (…) & Zivkovic, L., 2014. Plant communities of Italy: The vegetation Prodrome. *Plant Biosystems* 148: 728–814.

Dengler, J., Biurrun, I., Apostolova, I., Baumann, E., Becker, T., Berastegi, A., Boch, S., Dembicz, I., Dolnik, C., (…) & Weiser, F. 2016a. Scale-dependent plant diversity in Palaearctic grasslands: a comparative overview. *Bulletin of the Eurasian Dry Grassland Group* 31: 12–26.

Dengler, J., Boch, S., Filibeck, G., Chiarucci, A., Dembicz, I., Guarino, R., Henneberg, B., Janišová, M., Marcenò, C., Naqinezhad, A., (…) & Biurrun, I. 2016b. Assessing plant diversity and composition in grasslands across spatial scales: the standardised EDGG sampling methodology. *Bulletin of the Eurasian Grassland Group* 32: 13–30.

Dengler, J., Wagner, V., Dembicz, I., García-Mijangos, I., Naqinezhad, A., Boch, S., Chiarucci, A., Conradi, T., Filibeck, G., (…) & Biurrun, I. 2018. GrassPlot – a database of multi-scale plant diversity in Palaearctic grasslands. *Phytocoenologia* 48: 331–347.

Mucina, L., Bültmann, H., Dierßen, K., Theurillat, J.-P., Raus, T., Čarni, A., Šumberová, K., Willner, W., Dengler, J., (…) & Tichý, L. 2016. Vegetation of Europe: Hierarchical floristic classification system of vascular plant, bryophyte, lichen, and algal communities. *Applied Vegetation Science* 19, Suppl. 1: 3–264.

Jürgen Dengler (juergen.dengler@uni-bayreuth.de)