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Assessment of a grassland island on a burial mound in the sea of agricultural land © B. Deák
The 61st Annual Symposium of the IAVS will be held in July in Bozeman, Montana, USA, and the Association is looking forward to an exciting meeting with interesting talks and excursions to alpine areas with the mountain plants in flower! Being located not far from Yellowstone National Park and other national parks offering spectacular, near-natural ecosystems, the theme of the symposium “Natural Ecosystems as Benchmarks for Vegetation Science” makes a lot of sense. Vegetation not or only slightly impacted by man can serve as a reference system, allowing us to assess the effects of various anthropogenic drivers - such as climate change, atmospheric pollution, invasive species and habitat fragmentation - on changes in plant species composition.

I would like to highlight two of the special sessions of the symposium, “Historical ecology in vegetation science” and “Temporal and spatial vegetation changes using permanent plots”, both focusing on vegetation changes over time and the importance of past events and legacies for understanding the current vegetation and its changes. In my opinion this is from an applied point of view one of the most relevant fields of vegetation science, because it may help us to answer the question whether there currently is a biodiversity loss on a local scale, and if yes why. Despite the fact that the ‘biodiversity crisis’ on all spatial scales is considered a truth among most ecologists and has even reached the general public complaining about the destruction of tropical rain forests and the decline of bees and other insects, there have been recent meta-analyses that call into question that local plant diversity is generally decreasing (Vellend et al., PNAS, 2013; Dornelas et al., Science, 2014). Critics to these papers have argued that biodiversity IS declining and that the time series data used in the papers are geographically biased and represent a conglomerate of studies with different purposes, baselines and drivers of biodiversity change (e.g., Gonzalez et al., Ecology, 2016). A recent perspective suggests that, for resolving the debate, it will be crucial that researchers in the future take more care in assembling high-quality data sets and testing specific hypotheses using defined historical baselines as reference conditions (Cardinale et al., Biological Conservation, 2018). Vegetation science can make an important contribution here: from many countries, hundreds of thousands sample plots are available in large data bases, containing information on local species presences and abundances, spanning several decades up to 100 years, and including all types of vegetation from near-natural to anthropogenic. Historical vegetation science can make use of this treasure, especially of the increasing number of permanent or semi-permanent plots (some of them even associated with old measurements of environmental variables) to better quantify the changes in biodiversity and to find the driving forces behind them. Therefore I am looking forward to these (and other) sessions in Bozeman.

IAVS Wants Your Feedback

How do you, the IAVS members, perceive the role of our scientific community and association in your professional and private lives? You are welcome to share your experiences and impressions by the monkey survey at: https://www.surveymonkey.com/r/IAVS. Our survey will be open until the end of March.
2018 IAVS Symposium: Second Circular

The 61st Annual IAVS Symposium will be held from Sunday, 22 July to Friday, 27 July, 2018 at Montana State University in Bozeman, Montana, USA. The theme of the meeting is “Natural Ecosystems as Benchmarks for Vegetation Science”.

Bozeman is located in the Greater Yellowstone Area close to the Crown of the Continent of the northern Rocky Mountains. The timing of the symposium is optimal to see the subalpine and alpine flora in flower and will also allow participants to attend the 103rd Annual Conference of the Ecological Society of America, which is August 5-10 in New Orleans, Louisiana if they wish. The symposium website is located at: http://iavs.org/2018-Annual-Symposium/Home.aspx
Local Organizing Committee

- David W. Roberts, Montana State University (co-chair), droberts@montana.edu
- Peter R. Minchin, Southern Illinois University Edwardsville (co-chair), pminchi@siue.edu
- Kent Houston, US Forest Service (retired)
- Stephen V. Cooper IV, Montana Natural Heritage (retired)

Scientific Committee

- Alessandra Fidelis, Brazil
- Alessandro Chiarucci
- Dave Roberts, USA
- Florian Jansen, Germany
- James Moore, USA
- Jari Oksanen, Finland
- Javier Loidi, Spain
- Laco Mucina, Australia
- Loretta Battaglia, USA
- Mark Fulton, USA
- Martin Diekmann, Germany
- Meelis Pärtel, Estonia
- Milan Chytrý, Czech Republic
- Miquel de Cáceres, Spain
- Monika Janišová, Slovak Republic
- Pavel Krestov, Russia
- Peter Minchin, USA
- Riccardo Guarino, Italy
- Scott Collins, USA
- Scott Franklin, USA
- Susan Wiser, New Zealand
- Valério Pillar, Brazil

Registration

Registration is now open through a link on the symposium website. The early bird registration fee for IAVS members is US$570 for non-students and US$330 for students. Registration includes the Sunday evening welcome reception at Story Mansion, plenary and breakout oral sessions, poster sessions, a mid-week excursion, coffee breaks, lunches, and shuttle bus transport between MSU campus, downtown Bozeman, and the symposium hotels. Tickets to the symposium dinner, which will be held at Deer Park Chalet at Bridger Bowl on Thursday evening, are US$80. Please be sure to register early (by 30 April), as fees are significantly higher after that date.

Abstract Submission and Travel Award Application

Abstract Submissions and Travel Award Applications are now open through a link on the symposium website. The deadline for submission of abstracts and travel award applications is 5 March, 2018 at 11:59 PM (eastern US time). If you are planning to apply for a Travel Award, please read the web page on Travel Award Application first and make sure that you meet the eligibility requirements and have the required documents at hand. If you are a student and you would like your talk or poster to be considered for a Student Presentation Award, there is a box that you should check during abstract submission.

The abstract text is limited to a maximum of 400 words. We recommend that you type your abstract in a word processor and then copy and paste it into the submission form. Once you have submitted an abstract, you will be able to come back and edit
it as often as desired, up until the deadline on 5 March. The Global Sponsorship Committee and the Scientific Committee will work hard to ensure that decision letters on abstracts and travel award applications are sent out by 26 March, 2018.

**Volunteering**

As in past symposia, the Local Organizing Committee is offering prospective attendees the possibility to volunteer at the symposium in exchange for a discounted registration fee. Please see the IAVS 2018 website for details.

**Program**

We are excited to announce our **plenary speakers** will be:

- Bob Peet, University of North Carolina at Chapel Hill
- Janet Franklin, University of California – Riverside
- Scott Collins, The University of New Mexico
- Naia Morueta-Holme, University of Copenhagen

Nine **special sessions** have been accepted on the following topics (organizers’ contact information is available on the IAVS 2018 website):

- Species pools across scales: an integrative perspective
- Temporal and spatial vegetation changes using permanent plots
- Toward a circumpolar Arctic vegetation classification
- Invasive species on coastal dunes
- How can novel ecosystems be useful as benchmarks for vegetation science?
- Historical ecology in vegetation science
- The US national vegetation classification system
- Dispersal and plant reproduction in disturbance driven vegetation dynamics
- Theory and methods in vegetation science

An outline of the program structure will be released soon. There will generally be four parallel oral sessions each morning and afternoon, with 20 minute time slots for talks. Each session will be 2 hours in duration, allowing for up to six talks. Three poster sessions are scheduled, on the afternoons of the Monday, Tuesday, and Thursday. Each is 1.5 hours in duration and a cash bar will be available. Guidelines for preparation of talks and posters are on the IAVS 2018 website.

Sunday, 22 July has been set aside for **workshops and meetings** of working groups, rooms will be available in the MSU conference center. So far we have approved only one workshop, which is organized by the IAVS Vegetation Classification Working Group on the topic of “Rethinking biomes – towards a consistent high-level classification of global vegetation”. More information on this workshop can be found on the IAVS 2018 website. **If you would like to hold a workshop or meeting on Sunday, 22 July, please let the organizers know as soon as possible.**

**Excursions**

Pre- and post-symposium excursions will visit regional grassland, steppe, forest, and alpine vegetation. You can book and pay for excursions during registration.
The following are brief summaries.

**Pre-symposium Excursion A: Continental Divide and Glacier National Park**
July 17-21, 2018 (4 nights), Cost US$695

This excursion heads west of Bozeman to the western side of the Continental Divide. We will spend the first day exploring the beautiful Swan Valley, featuring the majestic and charismatic *Pinus monticola* and *Larix occidentalis* among the diverse, low elevation vegetation. We will stay overnight in Whitefish, Montana. The second day we will explore Glacier National Park, observing dramatic variability in vegetation, ranging from foothill grasslands and woodlands through dense forests to alpine vegetation at the peaks. Glacier National Park features many of the iconic species of the northern Rockies, including *Thuja plicata* and *Tsuga heterophylla* forests, and the well-known *Xerophyllum tenax*, *Vaccinium globulare*, and *Rubus parviflorus* hillsides.

After another night in Whitefish, we will continue west along the Kootenay River through the Flathead, Kootenai and Kaniksu National Forests to Sandpoint, Idaho, exploring the mesic low elevation forests of western Montana and the Idaho Panhandle. After Sandpoint, we will head south and east along the Clark Fork River to Missoula, Montana. Along the way we’ll visit both more xeric grassland vegetation and wetlands on the Flathead Indian Reservation. Finally, we’ll travel back to Bozeman through the valley bottoms of western Montana to see the iconic *Pseudoroegneria spicata/Festuca campestris* grasslands.

**Pre-symposium Excursion B: Yellowstone and Grand Teton National Parks**
July 17-21, 2018 (4 nights), Cost US$935

This excursion will travel south from Bozeman to Yellowstone and Grand Teton National Parks. The first stop will be in the Gallatin Valley at Big Sky, Montana, where we’ll take the tram up Lone Mountain to visit alpine vegetation. The next day we will enter Yellowstone National Park through the West Yellowstone portal and travel south through the western side of Yellowstone to Jackson, Wyoming. From Jackson we’ll explore Grand Teton National Park. We’ll visit Artemisia-dominated stream terraces, unique *Picea pungens riparian* woodlands, and the woodlands and forests of the Teton Range. After another night in Jackson, we’ll return to explore Yellowstone National Park, including vegetation of thermally-altered soils and other unique communities.

We’ll spend the night at the iconic Yellowstone National Park Lake Lodge. Finally, we’ll return down the Paradise Valley of Montana through Livingston, Montana on our way back to Bozeman by Saturday evening.

**Post-symposium Excursion C: Beartooth and Yellowstone National Park**
July 28 – August 1, 2018 (4 nights), Cost US$845

This excursion will head east from Bozeman to the Beartooth Mountains, and return through Yellowstone National Park. The first day we’ll explore lower and mid-elevation conifer forests of the Beartooth, spending the evening in Red Lodge, Montana. The next day we’ll travel up the Beartooth Highway ("the
most beautiful road in America”) to spend the day on the extensive alpine plateau. We’ll then enter Yellowstone National Park through the northeast entrance and travel down the Lamar River Valley. The Lamar features a broad valley of grasslands and wetlands with numerous bison, and often elk, wolves, and bears. We’ll spend the third evening at the iconic Yellowstone Lake Lodge, and then exit Yellowstone and travel south for Grand Teton National Park spending the last evening in Jackson, Wyoming.

The vegetation of Grand Teton is quite distinct from Yellowstone, with the beautiful Snake River stream terraces and the Teton Range to the west. The last day we’ll travel north from Jackson back to Bozeman with stops in the Gallatin Valley of Montana.

Mid-Symposium Excursions

A selection of one-day mid-symposium excursions will be provided to local grasslands, forests, and cultural/historic sites on Wednesday, 25 July, with costs included in registration. Details of these are still being finalized. We will open a web page soon that will allow registered participants to select their preferences for mid-symposium excursions.

Venue and Accommodation

The location for the 61st Annual Symposium of IAVS is Bozeman, Montana, USA. This traditional, yet contemporary town has a population of 45,000 and is tucked away in a valley surrounded by mountain ranges on all four sides. The symposium will be held at the Montana State University conference center, which is located in the Strand Union Building. The conference facility has a capacity for 500+ people.

July is one of the most beautiful and pleasant times of year in Bozeman. Although the surrounding mountains affect local weather in unpredictable ways, average daily temperatures peak around 28°C and nighttime lows often hover around 10°C. Mean rainfall in July is 36 mm. Afternoon showers and thunderstorms are not uncommon during this time of year, so be sure to pack a raincoat. The days are long, with sunrise at approximately 6:00 AM and sunset at approximately 9:00 PM. Links to information on dining options and things to do in and around Bozeman are available on the IAVS 2018 website.

We have blocks of rooms reserved at special rates at six hotels in Bozeman. Nightly rates for a double room range from US$149 to US$179 (plus taxes of 7% and US$2 per night). Though these prices may seem high, it must be remembered that July is the peak time of year for tourism in the Rocky Mountains and there is a very high demand for accommodation. A budget alternative is provided by student dorms, which are located on the campus of Montana State University. The nightly rate for a double dorm room is US$46 ($23 per person) and the rate for a single room is US$28 (in each case there is an additional 7% tax).

Full details of the accommodation options will be posted soon on the IAVS 2018 website. Symposium participants will need to book accommodation directly with their chosen hotel or dorm. In order to receive the negotiated symposium rate, you may need to
quote a Group Code that is unique to each property. In most cases, web links for direct reservations will be provided.

Travel to Bozeman and Local Transport

Bozeman can be readily reached by connections to Bozeman-Yellowstone International Airport (BZN). Direct flights from the east arrive from Minneapolis and Denver, with connections to New York, Newark, Philadelphia, Washington, and Atlanta. Direct flights from the west arrive from Seattle, Portland, Los Angeles, and San Francisco. The selected conference hotels all provide free airport shuttle services and a shuttle bus will be provided for people staying in student dormitories. Other airport transportation options include taxi and Uber.

Most of the symposium hotels are located off Interstate 90, approximately 4 km from the symposium venue on MSU campus. Downtown Bozeman is mid-way between the hotels and campus. We will provide a circulating shuttle bus service between the hotels, downtown, and MSU campus on each day of the symposium, starting early morning and finishing late evening.

Downtown Bozeman is a pleasant 25 minute walk (2 km) from campus through the tree-lined streets of the historic residential district. It is considered safe to walk in Bozeman at all hours. Other local transport options include taxi, Uber, and the free Streamline bus service, which operates daily between campus, downtown, and the area where the hotels are located. More information is available on the IAVS 2018 website.

Important Dates

- IAVS travel grant applications (and abstracts) 5 March, 2018
- Regular abstract submission 5 March 2018
- Decision letters on abstracts 26 March 2018
- Travel grant decisions announced 26 March 2018
- Final date for early registration with reduced fees April 30 2018
- Final date for standard registration 25 June 2018
- Final date to cancel and receive a refund (minus $35 management fee) 25 June 2018

We look forward to seeing you in Bozeman in July!

News from the Working Groups

This is a regular section devoted to the activities and news from the IAVS working groups, regional sections and committees. In the last Bulletin issue annual reports of six IAVS working groups and one IAVS regional section have been published. In this issue you can find the annual report of the Eurasian Dry Grassland Group (EDGG). The reports were presented to the IAVS Council prior to the Council meeting in Palermo, June 2017. Together with the Council Minutes and other supplementary materials they are available online at http://iavs.org/Governance/Council/2017-Council-Meeting-Minutes/Councilmeeting_Palermo_Minutes-Final.aspx.

Eurasian Dry Grassland Group (EDGG)

Report for the period from 15th June 2016 to 15th June 2017

Members and Organisation of the EDGG

Since the last report in 2016, the number of EDGG members slightly increased and reached 1184 members from 67 countries as of 30th April 2017. Membership in EDGG is still free of charge and can be activated by sending an e-mail to our membership administrator Idoia Biurrun (idoia.biurrun@ehu.es). So far the membership administration has been maintained separately from IAVS, creating double work and inconsistencies, but following a recent offer, first steps of integration of our membership database into the framework of the IAVS membership administration have been taken.

EDGG Events

The 13th Eurasian Grassland Conference (EGC) was taken place in Sigishoara, Romania on 20–24 September 2016 (https://egc2016.namupro.de/). The main topic of the conference was the Management and Conservation of Semi-Natural Grasslands: from Theory to Practice. The conference was co-organized by Fundatia ADEPT (http://www.fundatia-adept.org/) and Babeș-Bolyai University, Faculty of Biology and Geology, Cluj-Napoca (http://www.ubbcluj.ro/en/despre/). For the first time, EDGG conducted a series of technical workshops during the days of the EGC. The conference was attended by 85 participants from 25 countries.

The 14th Eurasian Grassland Conference will be held at 4-11 July 2017 in Latvia and Lithuania, hosted by Solvita Rušina (Latvia) and Valerijus Rašomavičius (Lithuania) and colleagues. Further information can be found at the conference homepage at: https://egc2017.namupro.de/. The demand for participation was particularly high, with 22 participants from 10 countries. The full report of the field workshop was published in the Bulletin of the EDGG 34 (Aćić et al., DOI: 10.21570/EDGG. Bull.34.19-31). The results of previous EDGG research expeditions were published for example in Tuexenia (Pedaschenko et al. 2013), in Agriculture, Ecosystems and Environment (Turtureanu et al. 2014) and in Biodiversity & Conservation (Kuzemko et al. 2016, Polyakova et al. 2016).

The 10th EDGG Field Workshop was held in the Central Apennine Mountains (Italy), from 3 to 11 June 2017 hosted by Goffredo Filibeck and colleagues (University of Tuscia, Viterbo). For more information see in the EDGG Bulletin 33, pp. 3-12. The detailed report on the field workshop is planned in one of the forthcoming issues of the Bulletin of the EDGG.

Publication Activities of the EDGG

EDGG has published three issues of its own electronic journal, the Bulletin of the Eurasian Dry Grassland Group within the reported period (Issues 32-34, all issues are freely available from http://www.edgg.org/publications.htm). Further, EDGG continued its long-standing tradition of Special Issues/Features in international journals over the past year. Currently, the following Special Issues/Features were published by the coordination of EDGG:

- The second Special Issue organised by EDGG in the journal Biodiversity and Conservation (eds. J. Dengler, D. Ambarli, J. Kamp, P. Török & K. Wesche). It is exclusively devoted to the natural steppes of the Palearctic biogeographic realm. With about 19 articles on about 400 pages it
Financial Issues

Main financial support of EDGG occurs via IAVS. In 2017, IAVS provides an annual baseline support (500€), will provide travel grants for the EDGG Field Workshop in Italy (2385 € for three participants) and the Eurasian Grassland Conference in Riga (2615 €; grantees not yet selected). The detailed reports will be submitted to GSC shortly after the respective events and will be reported in details next reporting period. Also a honorarium (1000 €) to one EDGG representative to attend the annual IAVS Symposium in Palermo, Sicily. The support is greatly acknowledged by the EDGG.

We used granted 3000 € project funding for 2016 as follows. In 2016 the IAVS jointly granted to EDGG and EVS a project money in the worth of 1500 € (750+750 €) for the development of ‘collaborative vegetation-plot databases in SE Europe II’. The money is used to cover travel expenses of Kiril Vassilev, Bulgarian Academy of Sciences to advance three collaborative vegetation plot databases in SE Europe, who partner with the European Vegetation Archive (EVA) and the global plot database sPlot: Balkan Vegetation Database, Balkan Dry Grassland Vegetation Database and Romanian Grassland Database. With this money thousands of additional relevés from this underrepresented region of Europe could be mobilized for these public databases. We received also a project funding in a worth of 2250 € for Eurasian Grassland Conference participation of EDGG Executive Committee members in 2016. This allowed the EDGG to ensure the participation three of its EC members at the General Assembly of the EDGG in Sighisoara, Romania.

We submitted the proposal in frame of project funding (for obtaining 3000 € for 2017) for supporting homepage development to the Governing Board of the IAVS. The IAVS GB requested additional information before the decision. We currently collecting the requested information and will submit a revised proposal for 2017 in the forthcomings.

We covered costs of linguistic editing in 2016 (792.1 €) of non-native authors in the EDGG special features in Biodiversity & Conservation and Haquetia. To these we used our baseline founding 2016 and also the EDGG savings from Special Issue Haquetia received in 2015 from University of Hildesheim.

Other EDGG Media

The EDGG homepage (www.edgg.org) during the report period was maintained at a basic level The IAVS provided us by the FASEB to accommodate our homepage at the IAVS server within the provided framework of the IAVS main page. Now that IAVS has offered this option we are currently clarifying whether this meets our needs or not, but we have also started to seek alternatives to it.

In order to enhance the rapid dissemination of information to our members about EDGG activities, as well as in order to attract new members, a discussion on various topics related to grasslands research and conservation has been established in the EDGG Facebook group. It can be visited at: https://www.facebook.com/groups/938367279561202/?ref=bookmarks

Facebook page editors:
Anna Kuzemko (anya_meadow@i.ua) and Stephen Venn (stephen.venn@helsinki.fi).

We cordially invite you to join EDGG, its events and activities!

Péter Török (on behalf of the Executive Committee of the EDGG)
What is the Best Vehicle for Work in Vegetation Science

Lab Vegetation Ecology and Conservation Biology, University of Bremen, Germany
(First presented during an ECOslam session at the Annual conference of the Ecological Society of Germany, Austria and Switzerland in 2011)

Introduction

Methodological issues have over the last years gained increasing importance in vegetation science. For example, when sampling plots in the field, various decisions have to be taken: Where should the plots be placed (subjective or (stratified) random)? How many plots are needed, and which size should they have? Which cover scale should I use for estimating species abundances? Even more decisions need to be made during data analysis, concerning problems such as data standardization, choice of ordination method, GLM or GLMM, etc. The importance of methodological questions is reflected in many papers and even new journals (such as Methods in Ecology and Evolution). A question that has been completely neglected so far (what a shame) is which car/vehicle should be used during field work in vegetation science. To our knowledge, there is not a single paper dealing with this hot topic. A search in the Web of Science (15th February 2018) using the key words “vegetation” and “car” gives 241 hits! However, either ‘car’ means something completely different (carbon accumulation rate, carotenoid content, conditional autoregressive, etc.), or the papers are about dull topics like the effects of roads on the taste of apples for blackbirds. Here we aim to examine which vehicle serves the purposes of vegetation scientists best when being confronted with many diverging demands: There are obvious trade-offs, for example between speed and size on the one hand and costs and environmental impact on the other hand. And which vehicle allows you to safely place your coffee cup close to the steering wheel or offers enough space for a refrigerator with a cold beer to celebrate the successful field campaign? The choice of vehicle has strongly biased the results of many field studies, especially of time series analyses reporting on increases in species richness. Remember field work in the 1970’s when you went out with your Volkswagen beetle, eight people and field equipment squeezed into the car, the heater broken or constantly heating up to 40°C. With stiff or sweaty fingers and your back and head aching, you could not tell apart Quercus from Poa and probably missed half of the species. Today you glide with your Mercedes SUV with a full navigating system directly into the field site in the middle of a nature reserve, deeply relaxed carry out the vegetation analyses and enter your data with lots of new species via the Alexa voice service into the computer. This study wants to shed more light on this issue, reporting on the results of some revolutionary experiments that were recently carried out. It also wants to stimulate other vegetation scientists to continue with this pioneering work.

Material and Methods

Study area and methods
The experiments were carried out in 2011 in and around a big city in North-western Germany. The large majority of vegetation scientists use ‘normal’ vehicles for reaching their field sites and transporting equipment. Therefore our “control” is a boring German middle class car with four seats and a frustratingly weak motor power. More difficult was the selection of the alternative vehicles, given that there are myriads of possible means of transportation. For financial reasons, not all vehicles could be tested, others were omitted due to unforeseen difficulties. The latter includes walking, because our test person has not yet returned from the field trip, but also teleportation developed together with the German Aerospace Center (DLR), a technology not yet mature and responsible for the temporary disappearance of some of our master students. We finally decided to use four different types of cars differing in important characteristics as evidenced in Table 1 (see also Fig. 1).

As not all students can afford to buy a car and for environmental reasons, we also tested a bicycle being superior to a car in acquisition and maintenance costs. Finally, in reminiscence of the early pioneers of vegetation science, we also made trials with a donkey (approved by the International Fund for the Welfare of Animals).

Each vehicle was tested in the three different scenarios. In each of the situations, nine physically
Table 1. Test parameters of tested vehicles.

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>General characteristics according to instructions</th>
<th>Speed and acceleration</th>
<th>Fuel costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Small (space for 4 gnomes) and ugly</td>
<td>Ridiculous</td>
<td>1 liter / 100 km</td>
</tr>
<tr>
<td>Van</td>
<td>Big (space for 9 persons) and ugly</td>
<td>Okay</td>
<td>10 liter / 100 km</td>
</tr>
<tr>
<td>Porsche</td>
<td>Space for 2 persons and a fridge, powerful motor</td>
<td>Wow! From 0 to 100 km / h in 3 sec, max speed 300 km / h</td>
<td>100 liter / 100 km</td>
</tr>
<tr>
<td>Messerschmidt</td>
<td>Normally space for 1 ½ persons, airplane engine</td>
<td>Sensational: From 0 to 100 km / h in 1 sec, max speed ∞</td>
<td>1000 liter / 100 km</td>
</tr>
<tr>
<td>Bicycle</td>
<td>Space for 1 person</td>
<td>From 0 to 100 km / h in ∞</td>
<td>NA</td>
</tr>
<tr>
<td>Donkey</td>
<td>Space for 1 person</td>
<td>No hurry</td>
<td>Just hay</td>
</tr>
</tbody>
</table>

grown-up vegetation ecologists had to be transported together with their field equipment (Fig. 2). The scenarios were all highly realistic:

- Situation 1 (no worries-scenario): Normal field work day.
- Situation 2 (no-time scenario): A forest owner gets tired of the conservation authorities and is on his way to clear-cut your permanent field site! You need to carry out the final monitoring, but you have only one hour to get to the plot, and the forest is 145 km away from the office.
- Situation 3 (no-money scenario): Your last eight research proposals all failed (as usual), the budget of the lab is a disaster. Financially broke, the field campaign needs to be organized by keeping costs for transport, stuff etc. low. Instead of paying for the assistants, the sampling is done with the help of unpaid field slaves and students (which basically is the same).

The criteria for evaluating the performance of the vehicles included: (1) Space for people; (2) Space for equipment, (3) Speed, (4) Fun and beauty (of the car, not the field assistants), (5) Acquisition and fuel costs; (6) Off-road capabilities; (7) Many-sidedness; (8) Ecological footprint; (9) Coffee drinking facilities.

As some of the variables were difficult to quantify on an interval scale, such as fun or coffee drinking facilities, all nine criteria were estimated using ordinal or categorical scales.
Fig. 2. Left: Some of the researchers and students involved in the experimental trials. The painting coveralls were used in order to not contaminate the field sites. Right: Test equipment. Note to the left the camping chair for the professor.

Fig. 3. Left: The control car performed reasonably well, but was much too slow in the no-time scenario and had certain space problems. Right: The van didn’t have space problems, but was also useless in the no-time scenario, and boring.

Fig. 4. Left: The Porsche was not the first choice in the no-money scenario, but superior in the no-time scenario. Observe that you have to dress up (leather jacket, tie) when driving a Porsche. There was even enough time for a prosecco before going to the field site (which, however, had a negative effect on the data quality of the sampling). Right: The Messerschmidt is incredibly fast, but a bit old-fashioned. Observe the yellow plant community detector that dips when coming close to a character species.
Fig. 5. The bicycle failed because it did not offer enough space for nine people, and also the transport of the field equipment turned out to be difficult. However, the bicycle showed a good performance in the no-money scenario although the test person wasn’t able to give reliable estimates of species cover in the plots.

Fig. 6. A donkey is a lovely animal, but stubborn. The research group is seen on day 1 when trying to convince the donkey to move to the field site (right). The group is still occupied with this task on day 5 (left). A frustrated and tired plant ecologist on day 7 (below). Conclusion: Only use donkeys if your field site is identical to the grazing area of the animal!

All Photos © M. Diekmann, J. Müller, M. Ahlbrecht & A. Pannek
Fig. 7. Results of the Principal Components Analysis. Eigenvalues unknown.

**Statistical analysis**

There were no replicates. They are too expensive, and they add lots of unnecessary variation that distract from the main results. We hate replicates. For the analysis, we first of all used common sense and judgment, behavioral skills widely found among vegetation scientists. In addition, we carried out indirect correspondence analysis, namely Principal Components Analysis (PCA) to describe the variation across the vehicles in response to the criteria tested. Despite the fact that we made experiments with an animal we applied the R package Vegan.

**Results**

In the no worries-scenario the only vehicle performing well was the van, all other vehicles were either too small for stuff and people (control, bicycle, Porsche and Messerschmidt) or never reached the field site (donkey). The no-time scenario was no challenge for the Messerschmidt and Porsche (but we had to pay several fines because of repeated exceedance of the speed limit), while the control car and van (looser vehicles) arrived only after the forest had already been logged. Here the bicycle came one field season too late, while the donkey again never made it to the study area. In contrast, in the no-money scenario only the bicycle met our expectations. Forget about the donkey. The following photographs illustrate the main results. The ordination results (Fig. 7) confirm the observations and illustrate the trade-offs between the different demands.

**Conclusions**

Our results were great! But there is no vehicle that satisfies all the demands. Still, our trials may give you some guidance which vehicle is the best for your own personality. If you want to be politically correct, use the bicycle or the donkey, but then you won’t make a career in vegetation science unless you fake your data (but you may still make a good field assistant). If you want to become a vegetation scientist ending up with classifying sample plots for the rest of your life, stick to a middle class car or better a van. Note, however, that unforeseen situations like the no-time scenario will bring you close to a nervous break-down. Finally, if you give a damn about the environment, money, your colleagues and data quality, but want to have fun, buy a Porsche!

**Acknowledgements**

We are grateful to Gerd Traue & Paul Gerwinn (owners of the Messerschmidt Tiger), Arend Kiefer (owner of the Porsche), Andra Thiel (owner of the donkeys) and Tino & Pedro (the donkeys) for helping with the experiments.
How to cure grassland ecosystems?

By Monika Janišová and Péter Török

To be a restoration ecologist is like being a medical doctor. One has to cure, to heal, to repair, to recover, to restore complicated living systems for long term quality of life. Restored grasslands are partly similar to the patients, some of them in a critical state, some only slightly ill, but none of them hypochondriac. Restoration ecology is a developing scientific discipline with a profound impact on the human environment. One new restoration research team has recently been established in Debrecen, Hungary. I took the opportunity to interview the head of the team, Péter Török. Péter is also actively involved in the IAVS activities, mainly as a member of the Executive Committee of one of its working groups, the Eurasian Dry Grassland Group.

Monika Janišová (MJ): During the last several decades, European semi-natural grasslands have changed profoundly in their quantity and quality mainly due to continuing land use changes. Grassland conservationists calling attention to the fact that the recent conservation measures of the European Union do not reach their targets, and we are witnessing the largest loss ever in grassland species and habitats. Is the situation really so critical and what values are we losing in reality?

Péter Török (PT): It is not easy to summarise briefly the main threats and trends and to state what we lose. Very recently, the EDGG co-edited book, Grasslands of the World: Diversity, Management and Conservation entered the last phase of its preparation and will be published in the first half of 2018 by CRC Press (Squires et al. 2018). Together with 28 co-authors from 17 countries, we worked on 8 chapters including also an overview chapter for the whole Palaearctic. This means that about half of the whole book will deal with the current status, trends and problems of Palaeartctic grasslands. One of the most important findings we were faced with during the preparation of this book is that we do not know exactly what we have. There are highly uncertain figures for total grassland area even for the EU countries; there is no unified terminology for what we mean by permanent grasslands or high nature value grasslands, and an ecologically relevant database of grasslands is also lacking. Without these, a transnational lobby for grassland conservation and restoration is on weak ground.

MJ: Why are grassland species and habitats important for people other than biologists and agriculturists?

PT: Grasslands are very prominent landscape elements throughout Europe. Their expansion especially in Western and Central Europe dates back to the invention of the scythe, but in Eastern Europe, large areas of steppes already existed by that time.

Assessment of a recovered grassland by Péter Török
Grasslands were deeply rooted in the religious beliefs of nomadic tribes, and large expanses of grasslands represent the endless freedom where the sky directly touches the earth at the horizon. But to be more direct, can you, for example imagine Stonehenge without being embedded in grassland?

MJ: Why is grassland restoration interesting and why have you decided to focus on this topic?

PT: In general, it came by chance. I wanted to be a botanist from my early childhood, I grew up near the foothills of the Alps, close to the Austrian border of Hungary. I visited the Hortobágy Puszta (where my passion towards grassland restoration developed) first time in my life when I was about 10. My first impression was that there is nothing interesting there and I made a promise to never work in such a place (OK, it was in July :), not the best time to enjoy saline habitats). But life is rather complicated :).

I was educated in secondary school as a forester, but later I decided to continue my studies in Debrecen as a biologist. First, I worked in projects related to seed banks and spontaneous succession. During my Ph.D., I was involved in the monitoring of a large-scale grassland restoration in the Hortobágy Puszta that started in 2004. It enabled me to work with a very dynamic and inspiring research team at the Department of Ecology, led by Professor Béla Tóthmérész, with Orsolya Valkó, Balázs Deák, András Kelemen and Tamás Miglécz as core members. We worked then, and also now, on various topics in grassland conservation and restoration. Later on, restoration became one of my passions :).

MJ: Semi-natural grasslands evolved under the influence of human activities for many centuries. Can the short-term restoration activities really substantially help to keep the most important grassland values?

PT: The brief answer is definitely no. Grasslands, both restored and ancient ones, cannot be sustained nowadays without special management mostly by low intensity mowing and/or grazing. Thus, restoration and conservation planning should also consider issues of sustainability in the long-run and the involvement of local farmers and site managers in the process. One of the key issues is the sustainable restoration and management.

MJ: Do grassland restoration achievements survive after the restoration projects have officially ended?

PT: We have seen many successes but the most impressive successes are seen where there is very careful planning, where local sources of diaspores are used for the grassland restoration, and where long-term management issues are also considered. A splendid example for this can be found in the White-Carpathians, where Ivana Jongepierová and
Sowing experiment using high diversity seed mixtures in the Hortobágy Puszta
(Orsolya Valkó, Péter Török and Balázs Deák)

Seed bank sampling in the early spring in the Kiskunság sandy area, Hungary
(Orsolya Valkó, András Kelemen and Péter Török)
colleagues established more than 500 ha of grasslands using high diversity seed mixtures of local provenance.

**MJ:** Do all grassland habitats have the same chance to be restored?

**PT:** I think the most difficult is the restoration of those diverse and fragmented grasslands which have either a very suitable soil for agriculture (true steppes and loess grasslands) or have nutrient poor soils characterised by species with low dispersal capacity and/or low likeliness for seed bank formation (for example stands of calcareous dry grasslands). But beyond this, the landscape context should also be carefully considered – for example, the restoration of any grassland type is difficult in a cleared landscape. Grassland restoration in general means not only the restoration of a suitable species composition of plants, but also the restoration of a dynamic system, including also pollination systems or dispersal vectors and routes. In many cases these latter are the most important facets of success.

**MJ:** Restoration is an action of returning something to a former condition. In many parts of Europe, we still have high nature value grasslands preserved. I would like to know your opinion on what should be given priority in European grassland conservation – preserving the still-existing valuable grassland habitats or restoring the degraded grasslands to an acceptable state?

**PT:** In my opinion, priority should be given first to stop the loss of high quality primary and secondary grasslands as they harbour significant biodiversity and are also important sources of species and restoration material for other restoration actions. This means that I would prioritise first the preservation of existing HNV grasslands. As the habitat-based conservation paradigm cannot be hold, for the effective conservation of these grasslands active restoration measures are necessary, which also consider the landscape patterns and processes. Thus, we should prioritise restoration actions that enlarge the area of HNV grasslands, create buffer zones around them and establish connections between them and connect the grassland fragments to other natural habitats. This enables us to create a functioning network of natural habitats, as stated also in plans for creating and sustaining green infrastructure.

**MJ:** Could you introduce your recently established working group and the main aims you are focusing on?

**PT:** With the kind support of the Hungarian Academy of Sciences’ Momentum Program, we established a new research group, the MTA-DE Lendület Functional and Restoration Ecology Research Group. The research group aims to conduct functional and restoration ecological research in terrestrial and aquatic ecosystems. We are very interested in the temporal and spatial dynamics of terrestrial and aquatic communities, including succession, assembly rules, the issues of stability, spatial and temporal dispersal and establishment limitations. Of course, one of the main research objects of the research group is Palaeaeartic grasslands.

**MJ:** How can ecological theory contribute to practical grassland restoration? Is the scientific ecological knowledge more important than the traditional ecological knowledge and experience?

**PT:** I prepared a paper together with Aveliina Helm about this topic published recently in the discussion section of *Biological Conservation* (Török & Helm 2017). We summarised four crucial questions coming up frequently during practical restoration in which ecological theory can provide support. These are the following: (i) How to identify target species and baseline conditions in restoration for the selected habitat? (ii) When can one count on spontaneous dispersal and when are additional efforts required for facilitated dispersal of desired species? (iii) What determines the successful establishment and assembly of target species? (iv) What time-scale needs to be considered for the evaluation of restoration success and
species colonisation? One of the main conclusions was that there is a need to translate and link the current findings of theoretical ecology to restoration strategies; and to summarise the practical needs of restoration to obtain support from theoretical ecology. I think scientific ecological knowledge cannot be compared with traditional ecological knowledge and experience. Both have their role in the maintenance and recovery of biodiversity and ecosystem functions. I think that for the most effective conservation and restoration we should consider both.

MJ: The natural ecosystem is a complex assemblage of plant and animal species in their natural environment connected by multiple interrelationships. It is difficult to imagine that a restoration ecologist can control all the relevant factors. How can the most important factors be selected to reach the particular target?

PT: It is a difficult question, and there is no general answer. Most restoration actions focus on the recovery of target vegetation composition. Very few studies provide information on the recovery of soil biota or animal assemblages in restoration. However, several techniques facilitate the recovery of other components besides plants. For example, in grassland restoration, plant material transfer will also carry plant-dwelling insects with it, or during topsoil transfer a high proportion of the soil biota can also be transferred to the restoration site. However, these methods have strong limitations and especially the latter one seriously damages the donor site. I think restoration actions should be fine-tuned at the site level (for example in method selection) considering the site history, the type of community that should be recovered (i.e. setting a realistic target), financial and manpower requirements, availability of target communities in the landscape and local surroundings (i.e. the propagule availability in the landscape) just to mention the most crucial things.

MJ: I suppose that restoration actions always support some organisms and suppress some others. What criteria are used to select the restoration targets?

PT: Different measures should be applied for example if we would like to restore high nature value grasslands than if the target is to restore populations of a specific gap strategist species or to facilitate the immigration of nesting birds into the restoration site. What is good for one set of species could hamper another set of species. For example, if we would like to facilitate the establishment of a temporary wetland with many open surfaces to facilitate the immigration and nesting of migratory shorebirds, then we should try to raise the water table and to apply high grazing pressure with multiple livestock types to keep the vegetation cover low. But this would definitely hamper the grassland vegetation established at the site, which we have seen for example in a restoration project at the Hortobágy National Park. In each particular case we should carefully consider all options of restoration and prioritise which restoration goals we would like to fulfil or which target we should reach, in most cases within a short timeframe granted by external proposals or funding.
**MJ:** What are the main obstacles of recent grassland restorations and what solutions would you suggest?

**PT:** There are many obstacles that limit both the effects and magnitude of restoration actions. I worked mostly with grassland restoration, thus, I have examples from this business, but I suppose the restoration of other type of habitats have similar problems. To cite some of these problems, first I should mention that most restoration projects are financed from external sources, e.g. from a LIFE project in which the funding is granted for a limited period of time, let’s say for five years. Thus, the recovery of the restoration target is hard to reach and sustainability issues like long-term management are not considered. Second, it is necessary to maintain the reference habitats (i.e. natural or semi-natural grassland fragments in the landscape) to provide local propagule sources for restoration. The third point is that in most countries, sources of locally harvested plant material or seeds for restoration purposes are rather rare, and seeds originating from commercial sources cannot be used as they often originate from different parts of Europe or even from a different continent. I think with effective knowledge transfer and better transnational and cross-sector communication these problems can be effectively addressed.

**M J:** Thank you, Péter. Could you reveal some personal and contact data-name of your working place, working group, your study interests in general?

Péter Török (molinia@gmail.com)  
https://scholar.google.hu/citations?user=7ho2aw8AAAAJ

Just to be short with some personal facts, I’m married to Dr. Enikő Krasznai (phytoplankton ecologist) and have two kids András (4) and Dániel (2). My profession is vegetation ecology with strong emphasis on the functional ecology of grassland ecosystems, including reproductive biology, dispersal processes, biomass production and seed banks. I’m an associate professor at the University of Debrecen, Department of Ecology and as scientific advisor the leader of the MTA-DE Lendület Functional and Restoration Ecology Research Group. I also closely work together with algologists (my wife is also an algologist :)), thus the ecology of phytoplankton and benthic diatom assemblages is also not “out of scope”.

**References**


Forum

Invitation to apply for an interesting PhD study

A PhD research position will be available at Comenius University in Bratislava and Institute of Botany, Slovak Academy of Sciences in Banská Bystrica, Slovakia, with the topic “Diversity and conservation management of Carpathian grasslands”.

The position is for four years starting in September 2018 and is suitable for a student who would like to focus on European montane grasslands. The Carpathian grasslands have unique position among the world’s grassland ecosystems - they are extraordinarily species rich and many of them are still maintained by traditional rural communities, which is not the case in other regions of Europe.

The field research in all Carpathian countries (with a special focus on Romania, Slovakia and Ukraine) will include the detailed biodiversity sampling together with ethnobotanical investigations on traditional ecological knowledge in selected regions. The following questions are to be answered: How do historical and actual conditions interact in shaping the grassland diversity patterns we find today? What is the contribution of abiotic environmental conditions and that of agricultural practices? Given the fact that high nature value grasslands are among the most threatened habitats of the continent, what types of agricultural management are capable of conserving and maintaining grassland biodiversity? Which approaches based on traditional ecological knowledge can be implemented in state nature conservation of included countries? And finally, what are the ways to stimulate people to perceive the beauty of traditional landscapes, to appreciate the value of diverse grassland habitats as well as high quality of rural agricultural products?

Students with completed degree in biology, environmental or agricultural sciences are invited to apply (the registration will soon be available at the Comenius University webpage) and to contact the supervisor: Monika Janišová, Institute of Botany SAS in Banská Bystrica, e-mail: monika.janisova@gmail.com.

Good language skills in English are necessary. Native speakers of at least one language used in the study area and students experienced in field botany or ethnobotany, and those with good knowledge in applied ecology or sustainable agriculture will be favoured.

Monika Janišová, monika.janisova@gmail.com

Species-rich meadows in the Ukrainian Carpathians. Sarata, July 2016.

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Calendar of Events

POLAND
27th EVS Meeting, 23-26 May 2018

ITALY
15th EDGG Conference, 4-8 June 2018

AUSTRIA
11th EDGG Field Workshop, 6-13 July 2018

USA
61st IAVS Symposium, 22-27 July 2018