



Recommendations from young scientists for the Carpathian Convention

- Developed in the framework of university courses, created as part of the Project ProBioTIC
- Promoting Biodiversity through Transdisciplinary Learning Interventions in the Carpathians

Through the summer semester of (April to July) 2025 in Leuphana University, Germany and Jagiellonian University, Poland, two courses have been developed and implemented with the aim to investigate the application of transdisciplinary research to promote the Biodiversity of the Carpathians.

To this end, student groups in both universities contacted stakeholders from the Carpathian region around different sustainability and biodiversity issues and developed projects addressing various topics related to sustainable consumption and production and biodiversity. Listed below are the policy recommendations based on their work.

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RECOMMENDATIONS FROM YOUNG SCIENTISTS AT JAGIELLONIAN UNIVERSITY

Recommendations for strengthening biodiversity awareness and action in the Carpathians

Background

The recommendations presented below were developed as part of the course *The Carpathians: Navigating Challenges in Sustainability and Biodiversity*, held at the Faculty of Geography and Geology at Jagiellonian University implemented within the project ProBioTIC (Promoting Biodiversity through Transdisciplinary Learning Interventions in the Carpathians) led by Leuphana University Lüneburg (Germany), in collaboration with the Human–Environmental Systems Research Centre at the Faculty of Geography and Geology at Jagiellonian University, the HUN-REN Centre for Ecological Research (Hungary), and the Carpathian Convention.

Students attended a semester-long course aimed at co-designing interventions that address the gap between biodiversity conservation and sustainable consumption practices in the Carpathians. The course included weekly collaboration between students of both universities, joined sessions, and supervised project development.

Students learned how local biodiversity challenges are embedded in cultural, economic, and political realities. They also examined policy frameworks and gained training in formulating recommendations for policy makers, in order to bridge academic research, public communication, and regional decision-making.

The following recommendations are formulated based on the preparation, development, testing, and results of the individual student projects.

Overall Recommendations

1. Strengthen youth participation in Carpathian Biodiversity Governance

Young researchers should be systematically included in research working groups and policy task teams of the Carpathian Convention, as well as in partner research centers and NGOs. This will expand inter- and transdisciplinary perspectives, foster continuity in biodiversity knowledge transfer, address current underrepresentation of early-career researchers from Carpathian countries in international advisory forums -> recommend the establishment of a Carpathian Youth Biodiversity Communication Hub under the Carpathian Convention, responsible for coordination of youth involvement in Working Groups, maintain shared educational materials, support cross-border campaigns and student-led interventions

2. Communicate biodiversity through stories, experience, and local meaning

Effective awareness-raising requires communication that is emotionally engaging, culturally grounded, and audience-specific. Students emphasized: using locally rooted narratives (e.g., folklore, traditional land-use, botanical heritage), communicating via formats that evoke curiosity and care (e.g., workshops, guided trails, visual storytelling), linking biodiversity to daily life, identity, and place. This approach shifts biodiversity from an abstract scientific topic to something people feel connected to and responsible for.

3. Use creative transdisciplinary formats to reach broader audiences

RECOMMENDATIONS FROM YOUNG SCIENTISTS TO THE CARPATHIAN CONVENTION

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The student projects demonstrate that biodiversity messages become more impactful when communication: combines science with art, heritage, and sensory experience, uses interactive learning tools, such as games, citizen science, school workshops, or augmented audio routes, employs social media storytelling to reach younger generations and visitors. Such formats are cost-effective, scalable, and adaptable to different Carpathian regions.

Student project outputs and recommendations

Project 1 — “What’s Rustling in the Carpathian Meadows?” (Winner)

Team: Anna Kopczak, Katarzyna Sekta, Julian Skórski, Roksana Twardawa, Łucja Winiarska

Supervisor: dr hab. Agnieszka Wypych, prof. UJ

Reviving awareness and active stewardship of mountain meadows—ecosystems currently endangered by the abandonment of traditional shepherding and small-scale land management. The team used sensory learning workshops with children and a regional info-brochure (self-designed materials) to restore emotional ties to meadow herbs.

Meadows are biodiversity hotspots shaped by centuries of human–nature coexistence. When abandoned, they overgrow and lose species diversity. Protecting them requires knowledge and cultural attachment, not only regulation.

Level	Recommended action	Actors responsible
Education	Introduce herb and meadow biodiversity workshops into local school curricula (biology / geography + outdoor education).	Local schools, municipalities, NGOs
Tourism	Place project’s brochure in visitor centers, mountain shelters, agritourism farms, and herbal shops along Carpathian tourist routes.	Tourism boards, local guides, Carpathian Convention WG on Sustainable Tourism
Agriculture	Develop incentive schemes supporting farmers who maintain traditional mowing or sheep grazing that preserves meadow ecosystems.	Regional authorities, CAP (Common Agricultural Policy) programs
Community	Support seasonal Meadow Days / Herb Festivals to celebrate local plant heritage and strengthen cultural identity.	Local cultural centers, schools, Gmina councils

This approach reconnects young people, farmers, and visitors with the meadow landscape, strengthening both ecological protection and cultural continuity.

Project 2 — “Inherited Wisdom: How Folklore of the Carpathians Can Shape Environmental Ethics”

Team: Łucja Budzan, Saltanat Nurumova, Tisha Siteo, Egbert Salomon

Supervisor: dr hab. Małgorzata Luc, prof. UJ

Connecting biodiversity with cultural heritage by showing how highlander embroidery, wooden ornaments, and architectural motifs reflect real plant species—many now endangered.

When biodiversity is linked with identity and pride, **protection becomes personal, not abstract.**

Level	Recommended action	Actors responsible
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Museums & Heritage Centers	Create permanent or rotating exhibits linking folk motifs with the plant species they represent.	Regional museums, Carpathian cultural institutions
Tourism	Develop certified “Culture–Nature Learning Routes” including guided tours, mobile self-guided maps, and storytelling trails.	National park education teams, local tourism boards
Digital Education	Expand the ActionBound app (app designed by students) route and integrate quizzes that encourage exploring botanical gardens, open-air museums, and trails.	Municipal / regional education departments
Craft Cooperatives	Introduce biodiversity-branding labels for crafts that use traditional plant motifs to encourage pride and awareness (students designed the labels).	Local artisan associations

Strengthens environmental ethics by demonstrating that protecting biodiversity also protects the cultural soul of the region.

Project 3 — “The Carpathians Under the Lens”

Team: Weronika Kochańska, Monika Kiełtyka, Severin Boehm, Agata Koryciak

Supervisor: dr hab. Małgorzata Pietrzak, prof. UJ

Making Carpathian biodiversity visible and relatable through drone video, photography, and an Instagram educational campaign. Awareness precedes protection. If landscapes are seen only as scenery, not as ecosystems, then people underestimate threats.

Level	Recommended action	Actors responsible
Public Communication	Formally link the Instagram campaign (designed by students the channel on Instagram Instagram: Carpathians Lens) to Carpathian Convention channels & national park profiles for audience expansion.	Carpathian Convention Secretariat, park PR teams
Education	Develop ready-to-use classroom modules (short film + worksheets) for schools in the countries on the Carpathians.	Teachers’ networks, ESD educators
Tourism	Install QR codes at scenic lookouts connecting visitors to the drone film (YouTube: Drone film) + biodiversity facts.	Local municipalities, tourist centers
Youth Engagement	Launch an annual Photo Challenge for students.	Universities, NGOs, park education units

These actions may transform biodiversity into something visible, shareable, emotionally meaningful, especially for digital-native generations.



RECOMMENDATIONS FROM YOUNG SCIENTISTS AT LEUPHANA UNIVERSITY

In **Leuphana University** four student groups were formed as part of the ProBioTIC course focused on:

1. Pastoralism,
2. Citizen Science,
3. Public Attitudes toward Large Carnivores and
4. Ecotourism.

Pastoralism

This group explored how tourists can be educated on the importance of pastoralism for biodiversity conservation, the local economics of traditional cheese production E.g. Oscypek and further explored the issues addressing pastoralist in the Carpathians

Key messages:

- Young scientists recognise that the Russian invasion of Ukraine has intensified the problem of biodiversity loss as a consequence of fewer practicing pastoralists, noting that some pastoralists have left the country out of fear of being conscripted
- Traditional producers in Romania, including pastoralists, are also facing economic challenges. Industrial producers dominate the market while small-scale producers are marginalized In addition, consumers are deceived by low-quality imitations of traditional goods or intentionally misleading product labelling on industrial products
- Pastoralists may often find it difficult to apply for subsidies from the EU and other grant agencies as they are not recognized by the law in all Carpathian countries and thus have to work around policies designed for agriculturalists to benefit from subsidies.
- There have arisen issues around the grazing of herds in privately owned land that is not otherwise being used
- Rural depopulation is continuing to deplete potential future pastoralists.

Best practices identified:

- **The Owca Plus program in the Beskids and the Kraków-Częstochowa Upland:** Here, local authorities, pastoralists, and NGOs work together to restore biodiversity and cultural heritage through making contracts between the different parties which regulate subsidies for the pastoralists. This ensures that an area of around 600-700 hectares of land is grazed, keeps cultural practices alive and indirectly also contributes to tourism in the region
- **The Italian Pastoral School (Scuola Nazionale di Pastorizia), which is part of the LifeShepfor Bio project** and was set up to address precisely this issue of generational turnover. By combining modular and itinerant training with practical internships on



farms, and by fostering dialogue between shepherds, local authorities and other territorial actors, the profession becomes more accessible and attractive to newcomers. Early experiences suggest that this approach has succeeded in drawing in young people, women, and even career changers

Recommendations:

- Highlight the promotion of pastoralism through interventions, such as increased interpretation in tourist hiking areas in the Carpathians,
 - Specifically create information boards that have codes for interactive tours that stakeholders could co-produce to highlight the many benefits of pastoralism and how to spot authentic products, that support Carpathian biodiversity, such as Oscypek, through the labelling.
- Support the promotion of the EU “Protected Designation of Origin” (PDO) label for a variety of pastoralist products especially. The PDO label guarantees that a product has been traditionally produced and all steps of the production process have taken place in a specific region.
- Create better institutional and governmental support for pastoralists, particularly with regard to the bureaucracy of receiving financial support to maintain this traditional practice.
- Local authorities should step in as mediators where possible ensuring that there are grazing areas accessible to pastoralists

Citizen Science

One group focused on the role of Citizen Science (CS) in the Carpathians.

Through stakeholder engagement and a workshop in July with the Science 4 Carpathian working group they recognised a need for a public mapping of CS projects could foster a sense of community and enable active exchange. They also applaud the work of the citizen science community already engaged in various Carpathian projects. At Forum Carpaticum 2025 they also further inquired through a questionnaire to the participants as to their needs for CS in the Carpathians.

Recommendations:

- Support networking between CS projects in the Carpathians
- Strengthen communication about CS project through a central hub linked from the Carpathian Convention’s website.
- Support existing CS initiatives in Carpathian projects and supported actors involved through training and networking
- Consider responses to the FC2025 questionnaire on CS in developing further actions in this respect

Public Attitudes toward large carnivores (Bears)

Through the groups research they developed a workshop around communication training for both media and scientist stakeholders regarding bears. Specifically to desensationalise and add nuance to media on appropriate behaviour around bears to help human-bear coexistence.

Examples of best practice in this area :

- In the 2022 first bear-themed festival and conference TusnadEcoBearFest which started exploring ways to improve human-bear coexistence. “The aim of the conference is to bring together a variety of views competences and experiences from various experts from Europe and beyond. With the support of local stakeholders, NatureFirst, CERV, WWF etc., different management strategies were implemented showing great results
- A local Bear Emergency Team (BET) was established using technology-based monitoring approaches to predict bear human conflict risk maps. According to historical data, specialists are able to develop strategies tailored for individuals and their personalities. Additionally, preventive measures like removal of wild fruit trees, clearing hiding spaces, adapting the waste management and using of electric fences were taken, reducing the number of encounters drastically. While in 2021 41 cases of damage by bears were reported, in 2022 and 2023 occurrences were reduced to zero.
- Another key aspect for the success of the first bear smart community in Romania is the communication within the local community and with tourists. Through the effective application of nature management, Băile Tuşnad was able to develop a coexistence in which humans and bears are protected. This example shows how the sufficient cooperation and communication between science, institutions and society improve the human-nature relationship¹.

Recommendations:

- For science communication regarding large carnivores, stronger institutional backing, along with dedicated media space for science, would help academics communicate their work more openly and confidently, enabling them to contribute more meaningfully to public discourse.
- As part of science funding, the obligation to have a communication and impact plan as part of research funding should help to encourage researchers to communicate their findings to the public. The stakeholder suggested that this obligation should be included in national grants as well, to ensure that researchers are encouraged to communicate their findings to the public.

¹ Papp, C. et al. (WWF, 2023): Creating bear smart communities: the example of Baile Tusnad, Romania. CDP news, Issue 27. <https://www.researchgate.net/publication/385811133>



- As part of AI technology in scientific research, a stakeholder mentioned the use of AI-powered camera systems to help in the detection and deterrence of specific species, such as brown bears.

Ecotourism

This group worked on the constellation of ecotourism and its need for further awareness, networking of guesthouses, support and developing a common language on Eco-tourism.

Key Messages:

- Workshops on biodiversity represent an affordable method to increase environmental awareness throughout the Carpathians.
- There is an intrinsic link between environmentally friendly agriculture and ecotourism

Recommendations:

- Tying into national programmes for biodiversity awareness raising, such as that in Ukraine, to enhance eco-tourism programs through their delivery of ecological knowledge to students and local communities and tourism stakeholders to lead to increased biodiversity stewardship among both hosts and guests.
- Subsidising organic and regenerative farming and make available agricultural subsidies for biodiversity-enhancing practices.
- Ensure continued communication between the science and tourism sectors, to respect areas of high scientific value and manage eco-friendly tourism.
- create a support and certification package for eco-friendly hostels that could be piloted among initially twenty guesthouses before scaling up based on lessons learned and best practice. Specifically this would include:
 - Support access to grants for eco-upgrade on hostels
 - This could be small grants and subsidized loans for eco-upgrades. This could also be tax breaks or reduced local fees for certified eco guesthouses. This could also include procurement incentives for buying local materials and services.
 - Establish a fund to provide consultancy on retrofits, sustainable business planning, and eco-certification for ecotourism across the Carpathians
 - Create a standardisation and certification scheme. This would require certified guesthouses to report simple annual indicators (occupancy, energy use, % local procurement, waste volumes). This scheme could publish a regional Sustainable Tourism Scorecard across the Carpathians countries.