Biosphere Reserves Institute, Eberswalde University for Sustainable Development

Research in European UNESCO Biosphere Reserves

BfN European Biosphere Reserve Workshop Series

13th–16th February, 2024, Eberswalde University for Sustainable Development, Eberswalde, Germany

unesco Centre under the auspices of UNESCO

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BfN Federal Agency for Nature Conservation

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International Workshop Research in European UNESCO Bioshere Reserves
Workshop Proceedings

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Schicklerstr. 5, 16225 Eberswalde
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Academic Directors:
Prof. Dr. Jan-Peter Mund, Biosphere Reserves Institute, Eberswalde University for Sustainable Development (HNEE)
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Editorial Team:
Yen-You Lin, Solomiia Hordasevych, Denise Margaret S. Matias, Jens Müller, Erik Aschenbrand,
Lisa Kopsieker, Ana Filipa Ferreira

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WORKSHOP ORGANISATION

Project Coordinator:
- Dr. Ana Filipa Ferreira, Biosphere Reserves Institute, Eberswalde University for Sustainable Development (HNEE)

Project Manager:
- Yen-You Lin, Biosphere Reserves Institute, HNEE

Scientific Support and Moderation:
- Prof. Dr. Erik Aschenbrand, Biosphere Reserves Institute, HNEE
- Prof. Dr. Denise Margaret S. Matias, Biosphere Reserves Institute, HNEE
- Prof. Dr. Jens Müller, HNEE
- Dr. Ana Filipa Ferreira, Biosphere Reserves Institute, HNEE
- Prof. Dr. Pierre Ibisch, Biosphere Reserves Institute, HNEE
- Prof. Dr. Vera Luthardt, Biosphere Reserves Institute, HNEE
- Lisa Kopsieker, Federal Agency for Nature Conservation (BfN)
- Dr. Benjamin Herold, Schorfheide-Chorin Biosphere Reserve

International Project Advisory:
- Lisa Kopsieker, Federal Agency for Nature Conservation (BfN)

Student Assistant:
- Solomiia Hordasevych, Biosphere Reserves Institute, HNEE

Rapporteurs:
- Gino Garcia, Biosphere Reserves Institute, HNEE
- Jana Gengelbach, Biosphere Reserves Institute, HNEE
- Jannis Splieth, Biosphere Reserves Institute, HNEE

With support from:
- Josiane Lowe, Biosphere Reserves Institute, HNEE
- Judith Kloiber, Biosphere Reserves Institute, HNEE
- Angela Dichte, Centre for Econics and Ecosystem Management, HNEE
- Prof. Dr. Jürgen Peters, Faculty of Landscape Management and Nature Conservation, HNEE
- Ines Duncker, InnoSupport | Gründung | Transfer, HNEE
- Andrea Wolter, Federal Agency for Nature Conservation (BfN)

LIST OF ABBREVIATIONS

BfN – German Federal Agency for Nature Conservation

BR – Biosphere Reserve

BRI – Biosphere Reserves Institute, Eberswalde University for Sustainable Development,
EuroMAB – Network of UNESCO Biosphere Reserves in Europe and North America

HNEE – Eberswalde University for Sustainable Development,
IberoMAB – Network of UNESCO Biosphere Reserves in Latin America and the Caribbean, Portugal and Spain

LAP – Lima Action Plan

MAB – Man and the Biosphere Programme,
NGO – Non-Governmental Organisation

PA – Protected Area

TBR – Transboundary Biosphere Reserve

UNESCO – United Nations Educational, Scientific and Cultural Organization,
UK – The United Kingdom

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Impressions of the excursion to the Schorfheide-Chorin Biosphere Reserve. © HNEE, Florian Reischauer

1. Executive Summary

The international workshop “Research in European UNESCO Biosphere Reserves” took place from 13th to 16th February 2024 at the Eberswalde University for Sustainable Development, Eberswalde, Germany. This event was part of a series of workshops funded by the German Federal Agency for Nature Conservation that aim to connect European biosphere reserve practitioners and facilitate the exchange of knowledge and good practices. The workshop brought together a total of 28 participants from 15 European countries, including managers and researchers, and it built on the Eberswalde Declaration and the Lima Action Plan to advance research in biosphere reserves. Specific themes addressed in the workshop included: current research progress, research gaps and needs, monitoring and research data accessibility/management and research collaborations.

» Biosphere Reserves research – where are we now?

The workshop emphasised the critical intersection of scientific research, policymaking and the practical realities of managing biosphere reserves, highlighting both the achievements and ongoing challenges faced by biosphere reserve practitioners and researchers in Europe while offering opportunities to exchange and connect, as well as an outlook for future action and collaboration. Biosphere reserves serve as invaluable landscapes for learning and research, and they contribute significantly towards improving the effectiveness of management measures. Workshop discussions highlighted the diversity of research projects conducted across a broad spectrum of topics, involving numerous institutions and stakeholders. However, a noticeable gap exists between scientific and academic requirements, policy and funding cycles and the on-the-ground realities of biosphere reserve management, which often hinders progress due to a lack of collaboration and communication between managers, practitioners and researchers, thereby negatively affecting effective management and governance. A recurring theme is the lack of visibility of biosphere reserves, as they frequently overlap with other protected area categories that have higher visibility among the population and policymakers alike. Some possible solutions suggested in the workshop included raising awareness among funders about the value of biosphere reserves and their contribution to broader policy objectives, enhancing experience and result-sharing across the network, establishing and sharing databases to connect researchers with practitioners, co-designing projects to foster collaboration among a diverse range of stakeholders and the better integration of research results into management practices.

2. Aims and Structure of the Workshop

According to the Lima Action Plan[1] (LAP), biosphere reserves (BRs) can play a significant role in sustainability research, for example by serving as living labs in which to understand and monitor social-environmental changes, by providing infrastructure for the development of research activities, by collaborating with research institutions and further stakeholders in the development and conduct of projects and by undertaking research to inform their own management plans.

This workshop links to previous activities of the Biosphere Reserves Institute (BRI) of the Eberswalde University for Sustainable Development (HNEE). In 2022, the BRI organised the International Conference "Science and Research in, for and with UNESCO Biosphere Reserves"[2]. At the conference, more than 100 participants from 46 countries jointly developed the "Eberswalde Declaration" (Appendix 1), a proposal to strengthen science, indigenous and other knowledge systems, as well as research in, for and with UNESCO biosphere reserves.

In 2022, the Eberswalde Declaration was presented to and endorsed by the International Coordinating Council of the UNESCO "Man and the Biosphere" (MAB) Programme. The declaration includes recommendations to conduct research in individual BRs, address data accessibility, communication and the publication of results, define research needs and establish collaborations with researchers and other local actors.

The aforementioned workshop aimed to advance the implementation of the recommendations of the Eberswalde Declaration and the Lima Action Plan for research in BRs. This event was also part of a series of similar events supported by the Federal Agency for Nature Conservation (BfN), which has been running since 2019. The BfN workshop series focuses on connecting European BR practitioners and facilitating the exchange of knowledge and good practices. Previous workshops, hosted by the Michael Succow Foundation, addressed topics of climate neutrality and participation in European BRs.

In this workshop, there was a strong focus on promoting active exchanges and networking between the managers and staff responsible for research and monitoring in different European BRs.

The "Research in European UNESCO Biosphere Reserves" workshop took place between 13 and 16 February 2024 at the Eberswalde University for Sustainable Development (HNEE), Germany. A total of 28 people from 15 European countries participated (Figure 1), representing a diverse range of roles and functions related with BRs: directors and other members of BR management bodies, heads of department, project managers, monitoring and research officers, coordinators and members of MAB National Committees and MAB Youth and coordinators of UNESCO chairs and Category 2 Centres. Professors/postdoctoral researchers from diverse universities and research centres, along with representatives of nongovernmental organisations or public organisations, were also present (Appendix 2). In addition, more than 20 people from HNEE and the BRI joined the workshop. Professors, researchers, Master's students taking the "Biosphere Reserves Management" course and project managers enriched the discussions with their knowledge about BRs.

The workshop included a welcome reception, four thematic sessions, an excursion to the Schorfheide-Chorin Biosphere Reserve, an intercultural celebration and a closing session. A general outline of the workshop programme is provided in Figure 2 with a more detailed overview in Appendix 3. This report provides a summary of the presentations and discussions of each session. The texts were either adapted by the editorial team from the abstracts sent by the authors or developed using the rapporteurs' notes and presentation slides.

(1) UNESCO 2016. Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016 – 2025). SC-16/CONF.228/11. Paris: United Nations Educational, Scientific and Cultural Organization.

(2) Aschenbrand E., Gräbener U., Ibisch P.L., Luthardt V., Matias D.M. & Mutschler L.M. 2023. Science and Research in, for, and with UNESCO Biosphere Reserves. Conference Proceedings, including the Eberswalde Declaration. Eberswalde: Biosphere Reserves Institute, Eberswalde University for Sustainable Development.

Figure 1: Workshop participants according to their country of affiliation

International Workshop

Research in European UNESCO Biosphere Reserves

13th – 16th February 2024
Venue: Eberswalde University for Sustainable Development, Haus 4 (04.101); Haus 6 (Aula), City Campus, Schicklerstraße 5, 16225 Eberswalde, Germany
Organisation: Biosphere Reserves Institute (BRI) of the Eberswalde University for Sustainable Development (HNEE)

Date / Time	13th Feb. (Tue.)	14th Feb. (Wed.)	15th Feb. (Thurs.)	16th Feb. (Fri.)
Morning	Arriving	Session 1 Topic: Current research progress (research priorities, methodology and results) 9:00@Haus 4 (04.101) Moderator: Prof. Dr Erik Aschenbrand, Faculty of Landscape Management and Nature Conservation, HNEE/BRI	Excursion to Schorfheide–Chorin Biosphere Reserve 8:45@Eberswalde Hbf Moderators: Dr. Benjamin Herold, Schorfheide-Chorin Biosphere Reserve, and Prof. Dr. Erik Aschenbrand, HNEE/BRI	Session 4 Topic: Exploring research collaborations 9:00@Haus 4 (04.101) Moderator: Dr Ana Filipa Ferreira, HNEE/BRI Conclusion & closing session Moderator: Ms Lisa Kopsieker, BfN
Afternoon	Registration 14:00@ Haus 4 (04.102) Welcome reception 15:00@ Haus 4 (04.101)	Session 2 Topic: Research gaps and needs 14:30@Haus 4 (04.101) Moderator: Prof. Dr Denise Margaret Matias, Faculty of Forest and Environment, HNEE/BRI	Session 3 Topic: Monitoring and research data accessibility and management 14:00@Haus 4 (04.101) Moderator: Prof. Dr Jens Müller, Faculty of Forest and Environment, HNEE	Departure
Evening			Intercultural celebration 19:00@Haus 6 (Aula)	

Figure 2: Overview of the workshop programme.

3. Workshop Proceedings

3.1. Welcome Reception

The international workshop "Research in European UNESCO Biosphere Reserves" was officially opened on 13 February 2024 by the president of the HNEE, Prof. Dr. Matthias Barth, who addressed the essential goal of the event, namely to link practitioners and to facilitate the exchange of good practices among European UNESCO BRs. Dr. Ana Filipa Ferreira and Prof. Dr. Erik Aschenbrand moderated the session, which continued with a presentation made by Ms. Lisa Kopsieker from the German Federal Agency for Nature Conservation (BfN). Ms. Kopsieker introduced the BfN and explained its commitment – and that of the German government – to support the implementation of the MAB programme, both nationally and internationally (Figure 3). This presentation was followed by an introduction to the BRI and the Eberswalde Declaration by Prof. Dr. Vera Luthardt.

The presentation by Ms. Caroline Dabard, a PhD researcher at the BRI, set the stage for the first discussions about research in BRs. Ms. Dabard presented initial results from the BRI joint study "Biosphere Reserves as model regions for transdisciplinarity? A literature review[1]". This work provides a comprehensive overview of research conducted in BRs to date, delineating contributions to sustainability science and to the MAB programme. The welcoming reception closed with a round of introductions and informal exchange among the participants.

> *Linking biosphere reserves is essential for advancing research, as it facilitates the exchange of knowledge and good practices.*

(1) Dabard C.H., Gohr C., Weiss F., von Wehrden H., Neumann F., Hordasevych S., Arieta B., Hammerich J., Meier C., Jargow J., Luthardt V., Ibisch P. & Ferreira, A.F. 2024. Biosphere Reserves as model regions for transdisciplinarity? A literature review. Sustainability Science. 19 (2065-2081) https://doi.org/10.1007/s11625-024-01542-1

Figure 3: Impressions of the workshop welcome reception. © HNEE, Florian Reischauer

3.2. Session 1: Current Research Progress

Moderator: Prof. Dr. Erik Aschenbrand

The first programme session included presentations by five participants, who shared insights into research being conducted in biosphere reserves in Sweden, Italy, Albania/North Macedonia, Ukraine and Germany. Next, during the first coffee break, participants were introduced to HNEE's city campus during a guided tour facilitated by Prof. Dr. Jürgen Peters. A brief description of each presentation, and the discussion that followed them, is given bellow.

Biosphere reserve outdoor recreation research potential
Prof. Dr. Thomas Beery (Kristianstad University, Sweden)

Outdoor recreation research in the context of BRs has the potential to contribute to biodiversity conservation, cultural diversity, economic development and logistic support by underpinning development in research, monitoring, education and training. The Kristianstad University has established a close collaboration with two BRs: Kristianstad Vattenrike Biosphere Area and Blekinge Arkipelag Biosphere Area. Some of their joint research activities focus on exploring the potential of outdoor recreation within UNESCO BRs, as well as the effects of the Covid-19 pandemic on its management. In this context, outdoor recreation is an important method for fostering the human-nature relationship and creating nature-related experiences, which are the foundation for connecting to nature. BRs are complex arenas for connectedness research, and as a part of complex pathways of individual and collective barriers, they should contribute to increasing the pro-environmental behaviour of the population.

Discussion: Among many challenges to establishing the connection between nature experience, i.e., connectedness to nature and, consequently, pro-environmental behaviour, is an increased social focus on individual development rather than collective development, as well as the absence of structures to choose pro-environmental behaviour as an individual. The need for more research on the possibilities of institutionalisation of pro-environmental behaviour was strongly emphasised. Nevertheless, the uptake of research results in BR activities is not always guaranteed. One approach to overcome this issue is to be more active in involving people in BR activities, such as the Naturum visitor centres across Sweden, a connection between BRs and researchers/ and/or research institutes. A key prerequisite in this regard is establishing a connection between BRs and researchers and/ or research institutes. The Kristianstad University has a connection with BRs through the Stockholm Resilience Centre, but there are also other models for similar collaborations, e.g., research symposiums involving external universities.

Landscape-as-heritage-making in Italian biosphere reserves
Dr. Margherita Cisani (University of Padua, Italy)

The definitions of landscape and heritage in the context of Italian BRs are complex. There is a significant overlap between protected areas (PAs) and BRs, namely a 23.6 % shared area, which leads to confusion and the misinterpretation of these two concepts among local inhabitants and other actors. There is great recognition of the landscape value ("the beautiful Italian landscape"); however, the classical natural science approaches prevail over transdisciplinary approaches. Therefore, there is a strong focus on landscape preservation in Italian BRs, while cultural heritage (alongside ecosystem services) is seen as a development asset, mainly for tourism. The landscape is frequently conceived as an object of conservation, but BRs should instead preserve the "harmony" of the landscape, by balancing natural and cultural values, while sustaining local economies.

Discussion: There is a tendency towards an increase in the number of BRs managed by institutions that do not classify as PA (consortia, associations, etc.). This represents a shift from a conservation-oriented management approach towards a more development-oriented one. However, the term "development-oriented management" can be misunderstood and used to weaken conservation, and so it should therefore be used with care. A more integrated approach was previously applied in buffer zones, but currently there is a need to investigate the potential of social science and the idea of natural heritage within core zones. The postnormal science framework was discussed as a potentially useful perspective for this purpose, since it legitimises and integrates different types of knowledge systems into the research process.

Medical and aromatic plants in the Transboundary Biosphere Reserve Ohrid-Prespa Watershed: An opportunity for sustainable development of rural areas
Mr. Arian Merolli (Transboundary Biosphere Reserve Ohrid Prespa Watershed, Albania, North Macedonia)

The "Ohrid-Prespa Watershed" biosphere reserve, established in June 2014, is the first in Albania and North Macedonia and a new transboundary biosphere reserve (TBR) in the Balkan area. Efforts to create an area for conservation and sustainable development started in the mid-1990s in a project designed to safeguard the vulnerable and unique Lake Ohrid. This bilateral cooperation was supported by the Global Environment Facility (GEF) and the World Bank and recognised that the Ohrid Watershed includes both Prespa lakes as tributaries to Lake Ohrid. As a result, a bilateral agreement was signed between both countries to create the TBR.

A key goal of the TBR is to foster new practices of local development. In the transition area, the need to support

more sustainable activities emerged from meetings with the local communities. A good example in this regard is the aromatic and medicinal plants sector, which is of crucial importance from both an ecological and an economic point of view. Although illegal and unsustainable activities are still present, the recent establishment of an association with a licence-issuing and patrolling mandate demonstrates the commitment made by national and local authorities to implement a more rigorous protection regime.

Overall, the establishment of the TBR has encouraged the creation of an integrated system to regulate the primary sector of the economy. Another need related to traditional agricultural activities, which the TBR may support, is the development of environment-friendly cultivation schemes (e.g., reducing the use of pesticides) and quality labels for local products.

Discussion: The discussion highlighted some of the existing challenges in the TBR Ohrid-Prespa watershed, including overgrazing and frequent fires, which impact the ecosystem, as well as the unregulated collection of tea and medical plants, the latter of which are used for ecological restoration in cooperation with local actors, which offers an opportunity for connecting researchers and practitioners in the region. Some of the management issues include a lack of coordination and communication between the three national parks and local government authorities. For instance, there is no joint management plan or development strategy for the area, and it is challenging to facilitate the development of such a document involving both Macedonia and Albania.

Scientific research and monitoring in the UNESCO Carpathian Biosphere Reserve (Ukraine)
Ms. Iryna Yonash (Carpathian Biosphere Reserve, Ukraine)

The Carpathian Biosphere Reserve (CBR) was recognised by UNESCO in 2014, and now, in 2024, it is preparing its first 10-year report on its activities. It is also planned to formalise newly extended areas and the transition area. The CBR is classed as a national scientific institution, and scientific research is carried out there based on the Ukrainian legislation "Regulations on scientific and scientific-technical activity of Nature and Biosphere Reserves and National Nature Parks". The "Chronicles of Nature" annual report highlights key research topics, provides information on biotic and abiotic components of the BR and delivers summaries of a number of implemented nature protection measures, based on previous research projects and activities. The CBR has several long-lasting international collaborations, among them a cooperation with the Swiss Federal Institute for Forest, Snow and Landscape Research WSL (from 1996 and still ongoing) and with HNEE (from 2006 and still ongoing).

Discussion: The war with Russia is affecting the CBR both indirectly and directly due to lack of financing, employees being drafted for military service, technical equipment from the CBR being sent to the frontline and many refugees, thereby threatening natural resources. This leads to the reduced ability of BR management to support local communities. Furthermore, there is no legal basis for BRs in Ukrainian law, and it functions based on volunteer initiatives by PA employees, as well as the willingness and goodwill of local people. There are currently 30 scientists conducting research in the Carpathian BR, and they are always open to new international cooperation. The land is owned by the state, so there is no private land ownership, and some areas are managed by state forestry. There is no commercial forestry in the BR, but wood is provided for local use and for construction.

Input note: Research in biosphere reserves in times of war – a short input from Ms. Natalia Korinets, previous scientific secretary at the Askaniia-Nova Biosphere Reserve, Ukraine

Ms. Korinets was the scientific secretary of the Askaniia-Nova Biosphere Reserve, as well as a curator of the ungulates. Askaniia-Nova is the largest steppe reserve in Europe, and it is home to the largest zoological park in Ukraine (77 ha) and a unique dendrological park. The BR has already experienced the First and the Second World Wars and is currently occupied by Russia. Ms. Korinets had to leave the BR shortly before its occupation by Russia, to protect her life and freedom. She described that the current Russian administration of the BR is relocating animals from the zoo and destroying vegetation in the dendrological park and botanical gardens, thus degrading the natural steppe ecosystems typical for this area. She continues her scientific work remotely, looking forward to restoring the BR habitat, and she hopes it will eventually reopen in an even better condition, after the victory of Ukraine.

The critical role of research in policy: the Wadden Sea case study
Dr. Aline Kühl-Stenzel (NABU, The Nature And Biodiversity Conservation Union, NABU, Germany)

The Wadden Sea is a unique ecosystem that is famous for its extensive mudflats, fish spawning grounds and as a resting and breeding area for migratory birds. It contains critical habitats for endangered species and holds significant potential as a blue carbon sink. Saltmarshes on the German North Sea coast store about 7 million tons of carbon – equivalent to the annual emissions of 2.5 million people in Germany. It is important to involve local actors in the designation of potential nature conservation areas, since restoration measures critically depend on local and regional consensus. The BR concept has the potential to catalyse and facilitate this process.

Discussion: Restoration is becoming a top priority for the Wadden Sea, given its high potential to combine nature, coastal and climate protection. As areas within the

Figure 3 (cont.): Impressions of the workshop welcome reception. © HNEE, Florian Reischauer

Wadden Sea BR are drained and managed by local inhabitants, it is essential to close these drainage channels to restore valuable saltmarsh ecosystems. The BR can facilitate this process and serve as a venue for stakeholder involvement and open dialogue. However, this negotiation process is highly time consuming, and there is a need for research on optimising and accelerating collaboration activities.

3.3. Session 2: Research Gaps and Needs

Moderator: Prof. Dr. Denise Margaret Matias

The second thematic session of the workshop aimed at identifying and reflecting on current research gaps and needs in biosphere reserves. Presentations provided examples from BRs in the United Kingdom (UK), Moldova, Spain, Latvia and Georgia. During and between sessions, participants had the opportunity to converse and network (Figure 4).

Gaps and needs for research in, with and for UK biospheres
Prof. Dr. Marc Metzger (The University of Edinburgh, Chair of the UK National Committee for UNESCO's Man and the Biosphere Programme, United Kingdom)

UK biospheres are generally framed as places for sustainable development, focusing on cooperation, education and research. However, for various reasons – including biosphere funding – contributions to science are often a secondary consideration. There are great examples of research in, with and for UK biospheres. However, much of this research emerges in an ad hoc fashion in response to emerging opportunities, rather than more strategic considerations. And while some biospheres have established relations with individual academics and institutions, others are less familiar with engaging researchers.

The UK MAB committee aspires to think more strategically about research in, with and for biospheres, acknowledging constraints and challenges, understanding benefits and exploring opportunities (e.g., collaborating with other UNESCO programmes and speaking with research funders). As a first step towards the development of a research strategy, interviews and a survey as part of a strengths, weaknesses, threats and opportunities (SWOT) analysis, focused on the ability of biospheres to contribute to scientific knowledge for enhancing the relationship between people and their environments. Provisional outcomes of the SWOT analysis were presented, and feedback and insight were sought from participants about their experience in research collaborations in, with and for biospheres.

Discussion: In Brandenburg, Germany, a research manager in each BR is responsible for consulting and coordinating research activities and stakeholders. However, this is not the case across international BRs. The need for a shared database of good practices and research results in BRs was emphasised by participants, along with the need for closer collaboration between the BRs and universities, especially through communication and established processes for sharing resources.

Ukraine involved. In Germany, the teaching content in schools is strictly regulated, so it is very difficult to integrate any extensions and changes. Moldova faces similar issues. Here, the BR is trying to create offers for non-formal education by cooperating with schoolteachers without directly changing the curriculum. The BR is being promoted as a teaching hub for schools. Moreover, there is a demand for such extracurricular activities and they create opportunities for cooperations with schools.

Figure 4: A glimpse of discussions and networking opportunities during the workshop. © HNEE, Florian Reischauer

Nature-based solutions education in biosphere reserves
Mr. Anatolie Risina (NGO Verde e Moldova, Moldova)

The Horizon project NBS EduWORLD focuses on developing and implementing a naturebased solutions (NBSs) education network in the Lower Prut Biosphere Reserve as a pilot area. The overall objective is to support communities in transitioning towards an "NBS EduWORLD" where nature is embedded in citizens' daily lives and part of formal, informal and non-formal education streams, in turn creating green jobs and supporting social inclusion and cohesion through best NBS practice, technology and digitalisation. Resources delivered by other NBS projects and initiatives support the development of education materials, assessment frameworks and support networks. Further information on NBS EduWORLD can be found here: https://nbseduworld.eu/project. In line with the Sustainable Development Goals (SDGs, notably for SDG 13, SDG 14 and SDG 15), the results from this initiative will contribute to the development of green curriculum guidelines for governments and other educational stakeholders.

Discussion: As this BR focuses on education for nature-based solutions (NBSs), the discussion revolved around ways of teaching youth NBS. The most effective way is presumed to be "learning by doing," i.e., involving youth in activities, for instance by introducing buffalo to wetlands for natural grazing, with pupils from Moldova and

Biosphere reserves in Andalucia (Spain): how we deal with low visibility
Mr. Antonio López Fernández (Biosphere Reserve Dehesas De Sierra Morena, Spain)

The Dehesas de Sierra Morena Biosphere Reserve is a good example of the philosophy of the MAB Programme due to its multifunctional usage, including agroforestry, environmental and economic activities. It provides a range of ecosystem services that allow for both sustainable growth and nature conservation. Nevertheless, the BR concept is not widely known by the public, unlike natural or national parks. Through various activities and programmes, BR staff try to raise awareness amongst local communities and beyond. Last year, for example, with the support of the European Agricultural Fund for Rural Development (EAFRD), a cycling route was developed in the biosphere reserve. In summary, the Dehesas de Sierra Morena BR uses different channels to plan activities and organise events that raise awareness of the BR concept and its benefits.

Discussion: Participants reflected on what type of visibility the BR is lacking. Locals are unaware of the existence of the BR, and it lacks broader social visibility. The added value of the BR was also discussed. The status of a BR gives an opportunity to change people's perspectives about the protected area. Moreover, besides classical nature conservation, there is also space for economic growth. Eucalyptus plantations in the area were also addressed,

in that it is forbidden to plant new eucalyptus plantations, even though they are disappearing in some areas and cactuses are growing instead. However, industries continue to plant eucalyptus on privately-owned land.

Public misunderstanding of biosphere reserves and their low visibility among citizens, politicians and travellers
Prof. Dr. Agita Livina (Vidzeme University of Applied Sciences, Latvia)

The North Vidzeme Biosphere Reserve (NVBR), established in 1990 and spanning over 475,514 hectares in Latvia, represents a significant portion of the nation's diverse ecosystems, including terrestrial and marine areas. Despite its ecological and cultural importance, however, the NVBR suffers from low visibility and a lack of public awareness among local citizens, entrepreneurs and policymakers, as well as travellers. The lack of integration of the biosphere's multifaceted activities with its overarching identity further exacerbates this challenge. Recent studies highlight the fragmented approach to managing and promoting the NVBR. Key stakeholders such as the Nature Conservation Agency and local municipalities demonstrate varied levels of engagement, from high to minimal, which is reflected in the inconsistent recognition and leveraging of the reserve's potential. The Ministry of Environment Protection and Regional Development does not fully acknowledge the NVBR as a protected area, focusing instead on more narrowly defined conservation zones. This bureaucratic oversight undermines efforts to elevate the NVBR's profile and integrate it into regional planning and development initiatives.

Collaborative efforts with Vidzeme University of Applied Sciences have been pivotal. Initiatives include student research, international conferences and the UNESCO Chair on Biosphere and Man, all of which promote sustainable development and enhance educational outreach. However, these efforts need greater coordination to advance the NVBR's objectives holistically.

Revitalising the NVBR's visibility and integration requires a multifaceted approach involving strategic branding, comprehensive stakeholder engagement and robust educational initiatives. These steps will ensure that the area is recognised not only as a crucial ecological sanctuary, but also as a vital resource for sustainable community development and international cooperation in conservation efforts.

Discussion: In order to raise awareness of the BR, there is a need for constant public engagement. However, there is no coordination for activities and no clear overview of these activities within the BR. Branding of the BR is supported by local inhabitants, especially those involved in micro-businesses.

Three Alazani Rivers Biosphere Reserve. A hotspot for scientific research
Dr. Lasha Khizanishvili (Agrarian University, Georgia)

The Three Alazani Rivers Biosphere Reserve is a relatively new BR, established in 2022. It covers 199,944 ha and includes six PAs, three Emerald sites and 113 settlements. More than 1,000 species of vascular plants have been recorded in the highlands of the BR, with 22.5 % of plant species classed as endemic and of high conservation value. The BR also has a high number of mammal species, around 182 bird species and a variety of reptiles, fish and insects.

Discussion: Currently, there is no management plan for the BR, albeit a network is planned to be established by the end of 2024. Georgia's first forest inventory was recently carried out (44.5 % of the BR is covered by forest) and the data is stored on a special data server. Currently, it is planned to establish a forest inventory department and collect the data to populate the inventory every ten years.

Figure 5: Participatory exercise “Identifying Areas of Joint Action”. © Yen-You Lin

3.4. Session 3: Monitoring and Research Data Acceccibility and Management

Moderator: Prof. Dr. Jens Müller

In the third session of the workshop, participants from BRs in Romania, the UK, Portugal, Serbia and Austria shared their experiences of monitoring systems (e.g., for tourism and biodiversity) and the accessibility and management of data in BRs, in presentations and a participatory workshop (Figure 5).

Research activity and opportunities in North Devon UNESCO Biosphere Reserve
Mr. Andrew Bell (North Devon UNESCO Biosphere Reserve, United Kingdom)

North Devon Biosphere Reserve was re-established in 2002 as the first BR in the UK to comply with the 1996 Seville Strategy. Since then, it has constantly increased its capacity in research and monitoring through strong engagement with local universities and research institutions, promoting the reserve as a transdisciplinary research platform. The most frequent collaborations are with the universities of Plymouth and Exeter and Rothamsted Research with its station inside the reserve – a long-established environmental change network site. The research extends across the marine and terrestrial environments and covers natural and social sciences. Latterly, there has been an emphasis on digital monitoring and blending various data sources from in-situ sensors and remote sensing, e.g., applying “Internet of Things” technology and machine learning through Siemens’ Insights platform and providing interpreted information to end-users via their Mendix platform. The availability of such a platform and data is attracting research partners interested in monitoring for resilience and disaster prevention, as well as testing the efficacy of nature-based solutions. These elements will be a key part of the new codesigned research strategy being developed as part of the biosphere reserve’s periodic review process.

Discussion: The inception of monitoring initiatives goes back approximately 3 to 4 years, when the Ministry of Environment solicited the BR administration to assess water quality within the BR. Concurrently, privately owned water companies sought BR assistance to address flooding issues. The choice of affordable sensors was a strategic move to encourage both governmental and private sector investment while facilitating discernible benefits. It was also discussed how the BR is involved in the UNESCO Intergovernmental Hydrological Program.

Tourism in a biosphere reserve: Berlengas Man & Biosphere Reserve
Prof. Dr. João Vasconcelos (Instituto Politécnico de Leiria, Portugal)

The Berlengas Biosphere Reserve is located between the European and Mediterranean subregions and therefore has high biodiversity, exhibiting species from both colder and warmer waters. Every year, around 40,000 tourists visit the main island, from May to September, and these numbers are set to increase. However, the carrying capacity of tourists for the PA, defined by the management plan, is only 550 visitors per day, and current studies show that this amount is exceeded by a factor of 2 or 3 during summer months. These big tourist flows place severe pressure on ecosystems within BR. Some of the attempts to regulate the tourist flow include the introduction of a Berlengas pass (3 EUR daily entrance fee) and a visitation barometer, which is set to red every year.

The local community, various economic sectors and scientific and academic communities are divided on whether nature conservation or tourism development, along with the local value chain, should be prioritised. It is challenging for the BR administration to bridge these different interests and reach a consensus. Furthermore, competition for land use (local economic growth vs. long-term conservation), a lack of definition of sustainable tourism in the region, valorising heritage and insufficient communication of BR principles in the region are currently the biggest challenges for the Berlengas BR.

Discussion: One of the problems is that there are conflicts between the objectives of the BR, the PA and the geopark, which will be established soon. The PA is very small, and local guides must follow a code of conduct. The ratio between local visitors and tourists is approximately 50/50, and entrance for locals is free of charge. Regarding the use of collected money for the entrance fee, it is still unclear how exactly this money is spent. There are no problems with yachting so far; however, boats that transport tourists have a mandatory maximum 3-hour waiting period and an obligation to leave the island with the same group of tourists.

Monitoring the White-tailed Eagle (*Haliaeetus albicilla*, Linnaeus, 1758) in the Mura-Drava-Danube Biosphere Reserve in five countries

Mr. Marko Tucakov (Institute for Nature Conservation of Vojvodina Province, Serbia)

The Bačko Podunavlje Biosphere Reserve was established in 2017 and is a part of the transboundary BR Mura-Drava-Danube spanning five countries. With an area of 176,000 ha, it includes five municipalities in north-east Serbia, the former and current floodplain of the Danube River and four national PAs. The BR is actively working on the topics of climate change and risk management to address and prevent severe weather events, invasive species proliferation and habitat degradation. The Interreg project, titled "First joint census of selected river-breeding birds in the five-country BR Mura-Drava-Danube," provides valuable insights into breeding status, encou-

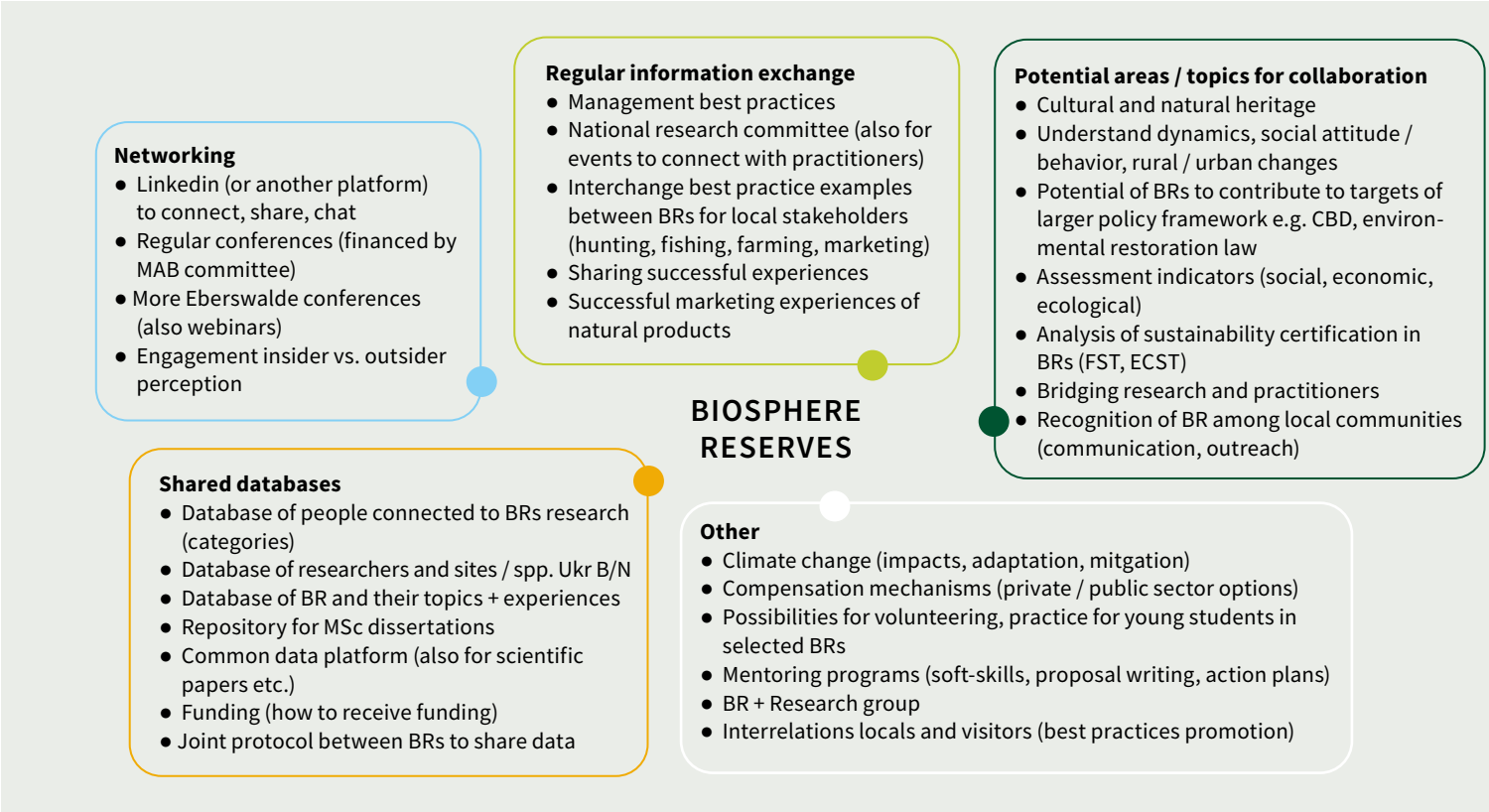

Figure 6: Main areas and topics for joint action across biosphere reserves related to monitoring and research data accessibility and management.

raging community engagement, volunteer participation and other supportive initiatives concerning species like the white-tailed eagle. Despite these efforts, there is still a noticeable gap between the scientific community and BR administration.

Discussion: There is an urgent need for research approaches in nature conservation including BR values, along with research on ways to support natural processes. Furthermore, social studies are required in the BR, since there are many local inhabitants with different needs and land-use demands.

Wienerwald Biosphere Reserve – Our approach to collecting and disseminating monitoring and research data
Mr. Andreas Weiss (Wienerwald Biosphere Reserve Management, Austria)

The Wienerwald Biosphere Reserve is located on the western outskirts of Austria's capital Vienna and was designated by UNESCO in 2005. The BR's management team cooperates with universities, mostly from Vienna but also from all over Austria, initiating research projects on relevant research questions or where data is needed for monitoring. In a "model region for sustainable development", it can be assumed that research projects are carried out in all "pillars of sustainability" (ecological, social and economic). In reality, however, most research activities focus on ecological and environmental topics. Regarding nature protection management, there are different sources of data for the BR. Open land mapping, with the determination of habitat types according to the EU habitat directive brought reports for every municipality in our BR-Region as one result. For dissemination, these reports are made available to the public on the BR website and local government websites (e.g., https://www.bpww.at/de/region/themenseiten/Gemeinden_und_Bezirke/penzing), whilst core zones are monitored on the basis of a fixed grid of around 1,600 monitoring plots. Forest succession and biodiversity parameters are monitored every ten years (e.g., https://kernzonen.bpww.at/profile/finsterer-gang-tenneberg/). An annual biodiversity day engages up to 100 experts on a voluntary basis to find as many species as possible in a specific area within two days. Dissemination measures include a family event (festival) involving citizens of the region and a special publication (book) describing all the species found in the BR (e.g., https://www.bpww.at/de/artikel/1383-artenfunde-beim-tag-der-artenvielfalt-inklosterneuburg). More information is available at https://www.bpww.at

Discussion: Two main challenges for the BR are the management of touristic activities and balancing the diverse interests of stakeholders, as approximately 900,000 people live near the BR. One achievement in this regard is a change in the usage of mountain bikes within the BR, which is regulated by a mountain bike concept de-

veloped by the BR administration. The mountain bike platform holds meetings three or four times a year and assesses existing mountain bike routes. Further information on monitoring methods, in particular data plots managing techniques, the frequency of data collection and demand on human resources, can be found on the official BR website. Monitoring is conducted every 10 years, and the data is used in contractual agreements and published in the BR's magazine. However, there are some precautions regarding open data dissemination due to the risk of exposing sensitive species' locations.

Participatory session: Identifying areas of joint action

Moderator: Prof. Dr. Jens Müller (Eberswalde University for Sustainable Development, HNEE, Germany)

After the presentations about monitoring and research data accessibility and management in European UNESCO BRs, the participants worked together to identify associated needs and opportunities. The main areas for joint future actions were related to networking, shared databases and regular information exchange. Specific areas and topics for collaboration, as well as further topics of interest, were identified (Figure 6). Principally, it was stated that there is a strong need for more networking and the regular exchange of data (or the establishment of shared databases) to identify collaboration potentials and programme overlaps in the future. This can be seen as a preliminary stage of joint research activities, and this workshop has contributed to moving forward and establishing new networks among participants.

3.5. Session 4: Exploring Research Collaborations

Moderator: Dr. Ana Filipa Ferreira

Current research in the UNESCO Spreewald BR: Understanding and implementing research as a collective task

Dr. Nico Heitepriem (State Office for Environment Brandenburg - Spreewald Biosphere Reserve, Germany)

The upper Spreewald Biosphere Reserve is characterised by an intricate mosaic-like landscape comprising historical Sorbian and German land-cultivation forms, whereas the lower Spreewald region is characterised by near-natural stands of both alder swamp and alluvial forests. The Spreewald BR itself serves as a good practice example of how sustainable land management can be implemented and performed. Research for sustainability is one important aspect which is realised by sound participatory approaches focusing on applied sciences (inter- and transdisciplinary), ranging from short to long term and local to international research projects. This is supported by several educational practices and means. The objectives are, inter alia, to increase knowledge about nature, promote the existence of environmentally friendly and well-guided sustainability-oriented management approaches and to promote broad environmental consciousness.

Important stakeholders with whom the BR works to reach these objectives, for example, are several research institutes, NGOs, the Civic Trust Kulturlandschaft Spreewald, the Spreewald Association, the farming and tourism sector, the Nature Guard Authority, etc. To this end, different conceptual approaches such as participation, cooperation and partnership, certification, information and joint projects are pursued. The main research areas of the UNESCO Spreewald BR are: i) ecology, biodiversity, nature conservation; ii) use and landscape change; iii) socioeconomics, regional development and tourism, governance; iv) education for sustainable development, communication and v) water balance and climate change. However, regional sustainability management can be very challenging, complex and laborious (invisible work). Therefore, bringing together movers and shakers and necessary resources is not only a key challenge, but also a great opportunity for successful sustainability research activities for UNESCO Spreewald BR and the overall BR network.

Discussion: Various questions were posed and discussed during the session, including: "What strategies can be employed to effectively engage stakeholders in participating and contributing meaningfully to research projects, such as those in citizen science?", "How might management collaborate with tourism associations and biosphere reserves to establish an effective framework?" and “Are there proactive solutions to guide tourist behaviour towards sustainability before their travels commence, such as the utilisation of a nudging approach to encourage sustainable practices?"

Connection between national and regional scales in the MAB programme

Dr. Alberto Hernandez Salinas (MAB National Committee Spain, OAPN – Spanish National Parks Autonomous Agency Spain)

As an integral part of the EuroMAB and IberoMAB networks within UNESCO's MAB Programme, Spain plays a key role in advancing the Lima Action Plan (LAP) 2016-2025. The country’s network of 53 BRs has been instrumental in implementing the LAP nationally and serves as a benchmark for international cooperation and good practice. The second Congress of the IberoMAB network, held in Copan Ruinas, Honduras, marked a significant step forward, with over 200 participants evaluating the LAP regionally and identifying critical actions needed before its 2025 conclusion. The congress was pivotal in connecting professionals from European BRs, mainly from Portugal and Spain, with their Ibero-American peers, thus facilitating a valuable exchange of good practice and insights to develop the IberoMaB Action Plan’s future. This collaboration enhanced mutual understanding and highlighted the diverse challenges faced by BRs in different geographical and cultural settings. Additionally, a comparative analysis is being conducted between the IberoMAB network and the Spanish BRs, using a standardised questionnaire to identi-

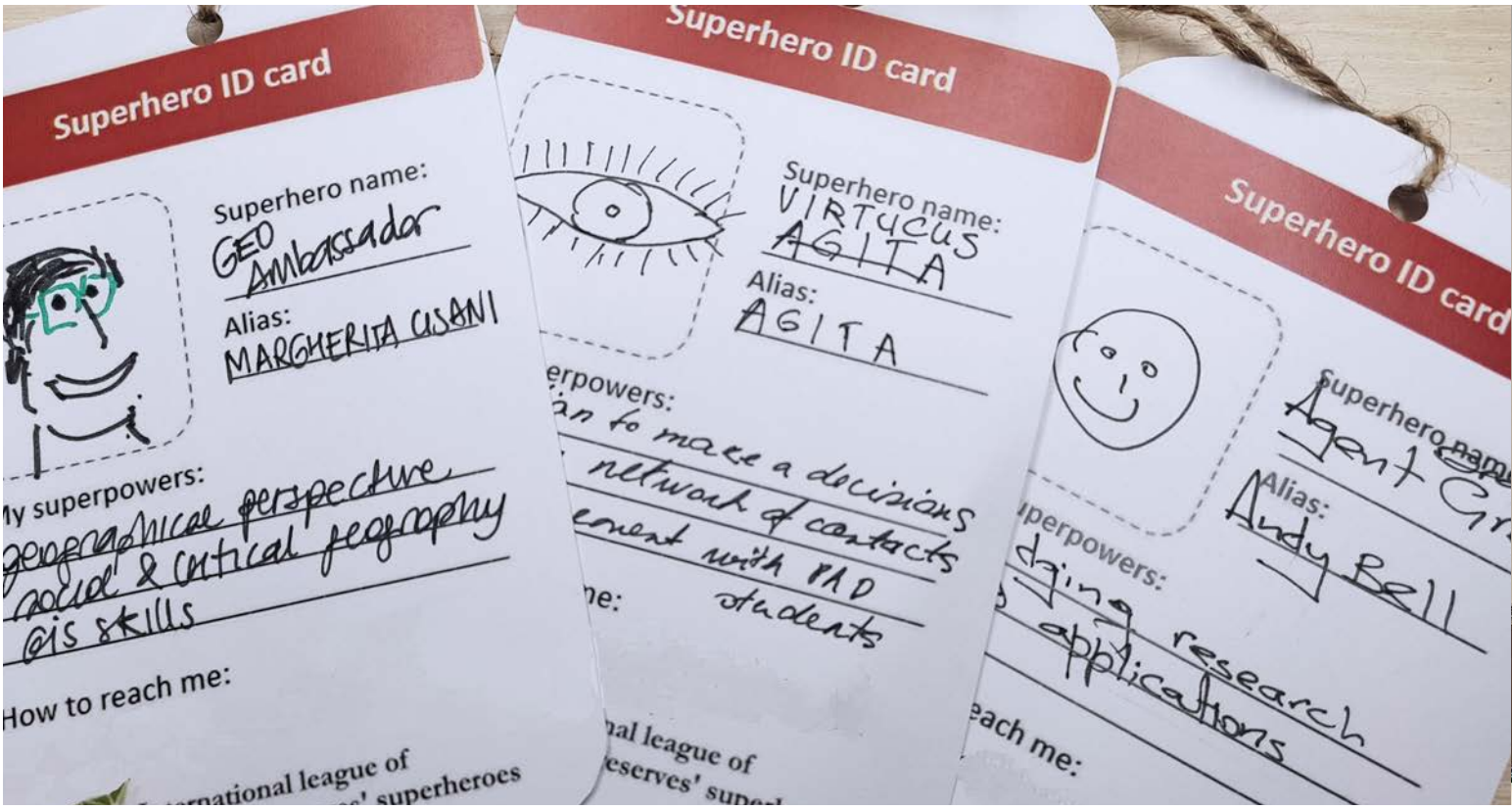

Figure 7: Participatory exercise: exploring research collaborations. © Solomiia Hordasevych; © Yen-You Lin

fy key LAP actions at the national level. This exercise aims to discern the benefits and challenges unique to each BR despite varying socialecological contexts. Furthermore, it emphasises the importance of working at all levels within the programme, especially regionally and nationally. This approach helps to recognise the unique characteristics of each site as well as the significance of addressing specific needs and gaps in BR management and the better definition of National Action Plans. The LAP mid-term evaluation showed that scientists were underrepresented despite being critical for the promotion of shared knowledge and improving BR management and local participation from local to regional levels.

Discussion: Communication between IberoMAB and OAPN was scrutinised, especially considering the perceived top-down approach often associated with the former. It was noted that typical staffing for Spanish BRs ranges between 10 to 15 members. A unique situation exists in Andalucía, where all BRs concurrently hold the status of nature parks and, in some cases, national parks, leading to a scenario where the same individual may be responsible for managing both the BR and the overlapping PA. Yet, this is not a uniform practice across Spain, as there are regions where BRs do not carry any additional PA designation. The group acknowledged the complexity of managing multiple PA layers, each with its distinct set of priorities and mandates. A significant point of discussion was the approach of the UNESCO MAB programme towards national and regional legislation. It was recognised that while the programme respects national sovereignty, allowing each country to determine its legislation regarding PA, there is a call from certain regions or countries for more direct guidance from UNESCO concerning legislative frameworks.

The natural evolution of biosphere reserves: different countries at different speeds
Prof. Dr. Luis Santos (Polytechnic University of Tomar, Portugal)

Drawing on data from 748 BRs across 134 countries, including 23 transboundary sites, the research emphasises the significant variability in the establishment and development pace of BRs worldwide, with notable examples from Spain, Russia, Mexico and China. The methodology involved a detailed analysis of case studies, such as the Highlands and the Boquilobo Biosphere Observatory, to analyse management strategies, and the integration of ecosystem services like water purification, carbon storage and sequestration, alongside provisioning and cultural services.

The findings highlight the crucial role of BRs in testing and demonstrating approaches to sustainable management and conservation. However, the study also identifies a range of challenges, including the need for improved governance, decreased dependence on public funds

and enhanced community involvement and sustainability practices. The future of BRs is discussed in terms of networking, specialisation, staff training and funding strategies to reinforce their status as catalysts for sustainable development.

The research proposes actionable strategies for the evolution of BR management, suggesting the elimination of redundant classifications, the reduction of administrative boundaries and the creation of conditions conducive to local sustainable development. These strategies aim to enhance the feeling of belonging, sustainability and governance within BRs, thus offering a roadmap for their future development and effectiveness in achieving global sustainability goals.

Discussion: The discussion addressed the strategic aspirations of BRs and how such expansion correlates with governance deeply rooted at the local level. A noteworthy observation was made regarding the planning of BRs, where it was revealed that approximately 90 % are conceptualised theoretically, with considerations for the territories, yet they often do not align with the actual administrative boundaries that exist. There was reference to the potential of landscape observatories to serve as an inspiration to broaden the BR network. Finally, a thoughtful exchange occurred on whether the MAB programme should deliberate on renaming BRs with more locally resonant titles, as evidenced by the UK National committee's adoption of "biosphere" and Austria's preference for "biosphere park." This point underscores the movement towards region-specific branding that resonates more profoundly with the local identity and ethos of BRs.

UNESCOMED C2C: Promoting collaborations, applied research and innovation in Mediterranean biosphere reserves. The case of the RES-MAB PRIMA project
Dr. Mari Carmen Romera Puga (UNESCOMED Centre – CTFC, Spain)

The International Centre for the Mediterranean Biosphere Reserves (UNESCOMED) – located in Barcelona, Spain – is a Category II centre (C2C) within the United Nations system. Since its inauguration in 2014, UNESCOMED has served as an example of public-private partnership by combining public commitment with private funding support. UNESCOMED is the technical secretariat of the MedMAB Thematic Network, the third official UNESCO's thematic network. One of the main strategic lines of UNESCOMED is to foster and develop interdisciplinary applied research on social, economic and environmental aspects that are meaningful in relation to Mediterranean BRs, as well as in terms of cooperation and the transferability and exchange of best practices across the Mediterranean region.

In recent years, UNESCOMED has collaborated on several international and national research projects and has su-

pervised several Master's and PhD students through its International University Campus for Mediterranean BRs. Networking, collaborative projects, public-private partnerships and knowledge transfer between academia, BR managers and local actors have proven to be effective mechanisms for supporting applied research and innovation that is meaningful to BR stakeholders.

The RES-MAB project is a remarkable example of international competitive research and innovation projects fostered by UNESCOMED and led by the Forest Science and Technology Centre of Catalonia (CTFC), in charge of the scientific and technical coordination of the C2C. RES-MAB is the 3-year PRIMA NEXUS project "Promoting WEFE Nexus-based adaptation and mitigation solutions and landscape resilience to climate change in the Mediterranean Biosphere Reserves".

Discussion: The discussion focused on the practicalities of the RES-MAB project as an innovation project model that currently operates within Catalonia at the regional level. The adaptability of this model makes it a viable template that could be extrapolated to other BRs and natural landscapes, thereby indicating a promising avenue for broadened implementation and potential standardisation across the Mediterranean biosphere network. The dialogue further revolved around the scalability of regional innovation frameworks and their customisation to the unique environmental, social and economic contexts of different BRs, thus fostering a diverse application of successful models. This discussion underscored the importance of tailored approaches to conservation and sustainable development within the MAB programme, reflective of localised needs and yet capable of wider adoption.

Participatory session: Exploring research collaborations

Moderator: Dr. Ana Filipa Ferreira (Biosphere Reserves Institute, HNEE, Germany)

This participatory session focused on exploring key skills among participants that might contribute to establishing and advancing research collaborations in BRs and also reflect on current challenges in developing or maintaining these collaborations. A superheroes metaphor was used: participants were asked to complete a superhero identity card (ID) to identify strengths and skills that help them navigate research collaborations in BRs, i.e., their "superpowers" (Figure 7). They then identified factors limiting the establishment and maintenance of research collaborations, missing skills or contacts and what they would like to improve. These were named "needs". Participants were then asked to match their needs and superpowers to those of other participants – was there someone they could help establish and advance research collaborations in BRs? Could they find someone with a superpower that could help them overcome their current needs? During the matching exercise, participants exchanged their superhero ID cards.

During the session, it was realised that many participants shared the same needs. Therefore, to continue the matching exercise and increase the possibility of more people connecting and collaborating, the participants suggested creating a shared Excel document, including existing needs and skills. Identified needs (Figure 8) were clustered in the following groups: networks and collaboration, projects, practical focus and applicability of research activities, funding opportunities, exchange of information and other.

I need help with ...

[**Networks and collaboration**]
- Finding BR contacts across Europe with a good overview of their national networks and BR activities
- Regional/global involvement in networks
- Increasing research collaborations and international research (and didactic) networks, thematic and transdisciplinary
- Committed local partners for joint research on sustainability transformations
- Committed practitioners belonging to Mediterranean BRs (i.e., managers, local leaders, researchers, academics)
- Development of renewable energies cooperatives in BRs
- Collaboration (joint research) activities with other BRs
- Platform (arenas) to connect the youth and other generations in the MAB programme
- Connection to an international network
- How to create a strong network

[**Projects**]
- Network for LIFE projects
- Network for Horizon projects
- Taking part in research projects and sustainable agriculture
- Increase the number of international projects

[**Practical focus and applicability of research activities**]
- Persuading land users
- Methods/ideas to connect researchers and practitioners in short- and long-term relationships
- Increase local impact
- Exchange experiences
- Build bridges between research interest and knowledge needs
- Enhance motivation towards BR management
- Learn how to get university departments involved in order to investigate real problems
- Communication skills with the local population

[**Funding opportunities**]
- Help find appropriate funding programmes
- Get an overview of possible funding sources

- Develop alternative financial schemes for communities close to PAs

[**Exchange of information**]
- Share information about the situation in my BR and nature damage in Ukraine
- More exchange of ideas
- Consultancy on how to improve governance structure processes (instruments, tools and concepts for BRs)

[**Other**]
- Methods for ecosystem services census
- University that knows how evaluate indicators (specifically linked to adaptation to climate change)
- Help with demining devices for research education
- Establish a "research manager" in Wienerwald BR
- Eliminate the destructive power of politicians
- Lack of capacity due to multitasking responsibilities
- Mentor
- A place to "plug in"
- Stable job somewhere not too warm and linked to BRs

Figure 8: Existing research collaboration needs, identified by the participants.

3.6. Closing Session

Moderator: Ms. Lisa Kopsieker (Federal Agency for Nature Conservation, BfN, Germany)

The closing session emphasised the critical intersection of scientific research, policymaking and the practical realities of stakeholders managing BRs. It highlighted both the achievements of and ongoing challenges faced by BR practitioners and researchers in Europe, while offering an outlook for future action and collaboration. The main take-home messages were organised into the following four main categories: 1) Where are we now?; 2) Remaining challenges; 3) Possible solutions and 4) Concrete next steps.

1) Where are we now?
- BRs have become pivotal in fostering nature conservation, notably by enhancing public understanding of restoration measures and the importance of pro-environmental behaviours.
- BRs offer the public access to local products and can establish good connections to the private sector.
- BRs serve as invaluable landscapes for learning and research, and they contribute significantly towards research on the effectiveness of management measures. This achievement underscores the diversity of research projects conducted across a broad spectrum of topics, each involving numerous institutions and stakeholders.
- BRs demonstrate a landscape approach to conservation, yet they navigate the challenge of remaining within the mainstream conservation model, which often focuses on leveraging nature for solutions.

2) Remaining challenges:
- A noticeable gap exists between scientific/academic needs, policy/funding cycles and on-the-ground realities of BR management. This often results in mismatches that hinder progress.
- Funding limitations and capacity issues persist, with variance between the priorities of funding bodies and the needs of BRs.
- The targets and agreements set during the EuroMAB conference in Dublin (2019) remain unaccomplished, reflecting broader challenges in achieving conservation goals and raising the question of how international meetings can be more effective at addressing identified challenges.
- Collaboration and communication between BR managers and researchers is often lacking, thereby complicating the effective management and governance of BRs, especially in the context of transboundary BRs.
- The lack of social science research on BRs, aligned with difficulties in engaging local stakeholders, highlights the need for more inclusive and interdisciplinary approaches.

3) Possible solutions:
- Raising awareness among funders about the value of BRs and their contribution to broader policy objectives is essential. This includes leveraging private sector support and highlighting the potential of BRs to funding programmes like Horizon Europe.
- Enhancing experience and result-sharing across the BR network can provide valuable insights into funding best practices and facilitate the development of more effective management strategies.
- Establishing and sharing databases to connect researchers with practitioners and to track BR publications can improve the alignment of research efforts with BR needs.
- Initiating co-design processes from the outset of projects can foster better collaboration and communication among all stakeholders involved in BR management.
- Integrating research results more effectively into management practices, as well as strengthening the connection of BRs to broader policy frameworks, is essential for demonstrating their value across sectors.

4) Concrete next steps:
- The workshop proposed feasible next steps, such as organising focus groups, joint sessions at international meetings and webinars on topics of interest to the BR community.
- A suggestion was made to select a current challenge and focus efforts to advance it. A specific suggestion was made regarding the creation of guidelines to develop research strategies in BRs. To make concrete steps towards the realisation of this idea, it was suggested that a workshop to write such guidelines could be developed in the next EuroMAB conference. This work-

shop was developed and organised together with the University of Natural Resources and Life Science (Vienna). It took place at the EuroMAB 2024 (3-7 June, Elbe River Landscape Biosphere Reserve) under the title: "Promoting impactful research in biosphere reserves in the context of a changing climate: Good practices to develop research strategies".

- The establishment of a LinkedIn network for BR practitioners and researchers was recommended to facilitate simpler – yet effective – communication and collaboration across the network. The LinkedIn group, named "Biosphere Reserves Research Group," was created during the closing session.

Figure 9: Excursion to the Schorfheide-Chorin Biosphere Reserve © HNEE, Florian Reischauer

3.7. Excursion to the Schorfheide-Chorin Biosphere Reserve

Moderators: Dr. Benjamin Herold (Schorfheide-Chorin Biosphere Reserve, Germany) and Prof. Dr. Erik Aschenbrand (Biosphere Reserves Institute, HNEE, Germany)

During the morning of the third day of the workshop, participants travelled to the Schorfheide-Chorin Biosphere Reserve, where they had the opportunity to unwind during a walk in the beautiful forests and to get to know better the landscape and the activities of the biosphere reserve management (Figure 9).

The Schorfheide-Chorin BR, located north-east of Berlin, features an impressive cultural landscape adorned with about 240 lakes, thousands of moors and extensive meadows and fields. Due to the proximity of the BR to HNEE, there is a well-established and continuous collaboration among those two institutions. Many of the research project's ideas originate from HNEE and are being developed and implemented in collaboration with the Schorfheide-Chorin BR, which offers advantages and opportunities for both institutions. Dr. Benjamin Herold has provided an overview of the current and past research projects of the BR in the field of sustainable agriculture and forestry.

By the mid-1990s, many new agricultural companies had emerged on the BR territory as successors to the former large state production cooperatives, ranging from small full-time and part-time family businesses to large agricultural companies. The BR's administration supported companies in converting to environmentally friendly land use through consulting and offering corresponding funding programmes, as well as by awarding regional agricultural products with a BR quality certificate. Special nature conservation goals for agricultural land (e.g., meadow breeding protection, staggered mowing of nutrient-poor wet meadows, grazing and bush removal from dry grasslands) are currently being implemented in collaboration with farmers through contracts with special funding schemes from the state. In recent years, further intensification of conventionally farmed arable land, due to the increased cultivation of bioenergy crops, has proven to be a significant problem.

Forests cover around 63,800 hectares and make up around 50 % of the total area of the BR. Most of the forest areas (approx. 77 %) are managed by the state forestry company. Approximately 75 % of the state forest and 30 % of the private forest are certified according to the "Pan European Forest Certification" (PEFC) system. The remaining state forest areas, as well as some private and municipal forest areas, are certified according to the Forest Stewardship Council (FSC) system. In the long term, forest development on the differently certified areas should be compared according to ecological and forestry parameters, while the proportion of areas certified according to FSC should be gradually increased.

Sustainability refers not only to ecological criteria, but also to social aspects through the increased preservation of jobs in rural areas. Due to its proximity to Berlin, this area attracts an increasing number of tourists, especially in summertime. However, local inhabitants do not seem to

be in favour of tourism development in the region, which leads to conflicts. Therefore, it is important to involve local inhabitants and stakeholders in planning activities, in order to set management priorities for the biosphere reserve in accordance with the diverse needs of interest groups.

3.8. Intercultural celebration

An intercultural celebration event took place in the evening of the third day of the workshop. Participants were asked beforehand to bring a cultural aspect from their BRs to share. The intercultural celebration provided a space for exchange and networking in an informal atmosphere while sharing delicacies and other cultural aspects from a diversity of European BRs (Figure 10).

Figure 10: Highlights of the intercultural celebration. @ Yen-You Lin

4. Sustainability Report

The HNEE is committed to fulfilling all aspects of sustainability through a whole-institution approach, not only in terms of education and research, but also in its operations. The university complies with the Eco-Management and Audit Scheme (EMAS) certification standard. The BRI follows the Principles for Sustainable Development formulated by the HNEE. From energy use and food supply, to transportation and carbon emission compensation, the BRI sets a high standard for the organisation of events, integrating sustainability into every aspect and always looking for ways to improve our environmental and social performance. Some of the sustainability procedures followed during the organisation of this workshop are described below.

Suppliers
Meals available during the workshop were provided by the HNEE canteen and catering from Globus Naturkost GmbH. The university canteen prioritises sustainability and regional suppliers alongside healthy meals. Many ingredients are regionally sourced (e.g., game meat), 100 % organic (e.g., coffee, rice and peeled potatoes) and Fair-trade (coffee). Vegetarian and/or vegan options are offered daily. Globus was chosen to provide catering for the workshop due to their commitment to sustainable and social business practices. Globus works with regional and organic products and producers, and some of their sustainability practices include the use of reusable packaging to minimise waste, green electricity, reduction of emissions associated with transport and the provision of support to local and small family businesses. Globus has the Schorfheide-Chorin BR certification label.

Materials for the workshop were purchased from Memo AG, a company committed to environmental and climate protection that offers ecological office supplies.

Transport and Logistics – BARshare Programme
The BARshare programme is operated by the local government (Barnim County)-owned business Barnim Energie. The approach of shared use, which BARshare calls the "main user/co-user principle", means that many people in Barnim can access a shared e-fleet at the same time and thus make a joint contribution to saving CO_2, reducing parking space, using existing vehicles efficiently and testing e-mobility as part of the transport transition in Barnim. During the workshop, BARshare e-cars were used to support occasional mobility needs.

Carbon Emission Compensation
HNEE actively compensates for its carbon emissions through partnerships with organisations like Ivakale e.V. The Kakamega Stove Project – an initiative focusing on installing energy efficient clay stoves in households to save firewood and reduce CO_2 emissions – illustrates HNEE's global commitment to sustainability. Including CO_2 emissions from the bus rented for the excursion to the Schorfheide-Chorin BR, and emissions by the sponsored participants travelling on commercial flights, a total amount of 3 tons of CO_{2eq} were compensated by the Kakamega Stove Project operated by the Ivakale e.V.

5. Appendix

5.1. Appendix 1 – The Eberswalde Declaration

The Eberswalde Declaration

UNESCO biosphere reserves: Knowledge for a better future together, fostering a new generation

Under the leadership of the Biosphere Reserves Institute (BRI) at Eberswalde University for Sustainable Development (HNEE), more than 100 early career researchers, UNESCO Biosphere Reserve (BR) managers, and national and international BR experts from 46 countries met in the Schorfheide-Chorin BR in Germany from 16–20 May 2022. Together, they developed the present proposal in order to strengthen science, Indigenous and other knowledge systems, as well as research in, for, and with UNESCO biosphere reserves.

The conference was supported by the German Federal Agency for Nature Conservation (BfN), with funds from the Federal Ministry for Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and with funding from the Brandenburg Ministry of Science, Research and Culture.

During the first half of the conference, the early career researchers had energetic discussions on their experiences and formulated their expectations for better implementation of the UNESCO MAB programme. In the second half of the conference, science practitioners as well as Indigenous and other knowledge-holders from a) agencies, b) BRs, and c) academia presented examples of best practices and reviewed the results of the early career researchers.

After intense discussions across and among regions, genders, ages, and specialisations, the participants wish to make the International Coordinating Council of the Man and the Biosphere (MAB ICC) programme aware of their key conclusions, proposals, and recommendations for action by the MAB ICC, the MAB programme, other relevant elements of the UNESCO Secretariat, MAB National Committees, UNESCO Member States, and other relevant stakeholders.

The 2016 Lima Action Plan calls for an active and open interdisciplinary network of scientists and other knowledge-holders who share the MAB Vision and Mission – a network that aims to develop a joint agenda on research and knowledge-exchange. The conference can be regarded as an important first step towards establishing such a network. At the request of the participants, the BRI at Eberswalde University for Sustainable Development offers to explore ways in which such a network could be further developed in an efficient and sustainable manner.

As the MAB programme is an inter-governmental science programme, the conference participants stressed the urgent need to revitalise and boost the MAB programme's focus on research, knowledgesharing, training, and education by using the BRs of the refreshed, strong, and growing World Network of Biosphere Re- serves (WNBR) as spaces for innovative sustainability research and partnerships. These spaces should have a particularly strong emphasis on youth and Indigenous Peoples.

Considering global challenges and increasing risks, the MAB programme must foster inter- and transdisciplinary research in order to play a much stronger role in combating the climate- and biodiversity crises and in promoting human well-being. This requires new forms of adaptive and innovative sharing of all types of knowledge that are supported by effective international knowledgeexchange.

The participants formulated specific recommendations for all relevant target groups, namely

- the UNESCO Secretariat,
- the UNESCO member states
- the MAB National Committees,
- individual WNBR BRs,
- subnational administrations,
- research institutions, and
- funding agencies and the donor community.

These recommendations are listed in Annex 1.

Eberswalde, 20 May 2022

Annex 1 to the Eberswalde Declaration

"Science and research in, for, and with UNESCO biosphere reserves"
Recommendations of the conference:
The participants of the conference recommend that ...
→ the UNESCO Secretariat
- define and actively communicate thematic research priorities;[i]
- encourage new – and strengthen existing – thematic networks;[ii]
- continuously develop the evaluation of BRs and make the results accessible;[iii] and
- provide a regularly updated, comprehensive, and easily accessible database of basic BR data;

→ the member states
- increase funding and identify other ways to improve framework conditions for research in BRs;
- create a regularly updated, comprehensive, and easily accessible database of basic BR data for the availability of comparable data, and
- increase the communication and visibility of research and science in BRs;

→ the MAB National Committees
- set and communicate research priorities for BRs on the national scale and – together with other regional MAB National Committees – on a regional scale and
- support access to data on BRs for researchers and institutions;

→ the individual WNBR BRs
- attract researchers to work in and investigate the challenges faced by BRs by
  a) making existing research results accessible,
  b) actively reaching out to researchers,
  c) holding research conferences in BRs,
  d) setting up long-term continuous monitoring, and
  e) making long-term monitoring data accessible;
- approach local universities and research institutions, partner with them, and jointly develop a research agenda;
- approach and work with UNESCO chairs and UNESCO Category II centres and institutes;
- identify and communicate local research needs and priorities that have been identified through dialogue and in consultation with stakeholders; and
- communicate and publish research results;

→ sub-national administrations
- define research priorities together with BR administrations on the BR territory;
- interact with BR management boards, Indigenous Peoples, and local communities in order to develop guidelines for research in BRs; and
- support UNESCO MAB awareness of and engagement with BRs on BR territory.

→ research institutions
- strive for demand-driven research from BRs and local communities, co-create research questions, and collaborate on equal terms;
- interact with BR administrations about research objectives in a transparent way;
- weave Indigenous and traditional knowledge with other forms of knowledge;
- consider local communities as equal partners;
- publish results in a FAIR (Findable, Accessible, Interoperable, Reusable) manner; and
- share knowledge and outcomes with BR stakeholders in an iterative manner;

→ funding agencies and the donor community
- strengthen the funding for research (including long- term research and monitoring) in, for, and with BRs.

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[i] Research priorities can be set in parallel both at the global scale and at regional scales. Research priorities could be set in a participatory process via an online survey among all BRs with the guidance of the MAB Scientific Advisory Board.

[ii] New thematic networks could focus on topics considered important for many BRs (e. g. climate change, urbanisation, rural outmigration, education, youth involvement, and BR governance).

[iii] In particular, evaluations should also encourage reporting failures and unexpected results. These evaluations should be used for learning and adaptive management.

Retrieved from:
Aschenbrand, E., Gräbener, U., Ibisch, P.L., Luthardt, V., Matias, D.M. & Mutschler, L.M. 2023. Science and Research in, for, and with UNESCO biosphere reserves. Conference Proceedings, including the Eberswalde Declaration. Biosphere Reserves Institute, Eberswalde University for Sustainable Development.

5.2. Appendix 2 – List of Participants

Name	Affiliation	Country of Affiliation
Arian Merolli	Ohrid-Prespa Watershed Transboundary Biosphere Reserve	Albania, North Macedonia
Andreas Weiss	Biosphärenpark Wienerwald Management GmbH	Austria
Marie Curtet	MAB France / MAB Youth	France
Furteau Emmanuel	Réserve de Biosphère de Moselle Sud	France
Lasha Khizanishvili	Three Alazani Rivers Biosphere Reserve	Georgia
Ulrike Willhelm	Ministry for Climate Protection, Agriculture, Rural Areas and the Environment in Mecklenburg-Western Pomerania	Germany
Nico Heitepriem	Biosphärenreservat Spreewald, Landesamts für Umwelt Brandenburg	Germany
Benjamin Herold	Biosphärenreservat Schorfheide-Chorin, Landesamts für Umwelt Brandenburg	Germany
Aline Kühl-Stenzel	Naturschutzbund Deutschland e.V. (NABU) Germany	Germany
Kirsten Meuer	Michael Succow Foundation	Germany
Margherita Cisani	University of Padua	Italy
Agita Līviņa	Vidzeme University of Applied Sciences / UNESCO Chair “Biosphere and Man”	Latvia
Anatolie Risina	NGO Verde e Moldova	Moldova
Luis Santos	Instituto Politécnico de Tomar	Portugal
João Vasconcelos	Instituto Politécnico de Leiria	Portugal
Marko Tucakov	Institute for Nature Conservation of Vojvodina Province	Serbia
Katarina Sýkorová	Faculty of Economics, Matej Bel University	Slovak Republic
Antonio López Fernández	Parque Natural Sierra de Aracena y Picos de Aroche / Reserva de la Biosfera Dehesas de Sierra Morena, Junta de Andalucía	Spain
Alberto Hernandez Salinas	MAB National Committee Spain, OAPN	Spain
Mari Carmen Romera Puga	UNESCOMED Centre – CTFC	Spain
Thomas Beery	Kristianstad University	Sweden
Johanna MacTaggart	Stockholm Resilience Centre / Swedish MAB Programme	Sweden
Marc Metzger	The University of Edinburgh / UK MAB Committee	UK
Andrew Bell	North Devon Biosphere	UK

Name	Organisation	Country of Affiliation
Vasyl Pokynchereda	Carpathian Biosphere Reserve	Ukraine
Iryna Yonash	Carpathian Biosphere Reserve	Ukraine
Alla Kozurak	Carpathian Biosphere Reserve	Ukraine
Natalia Korinets	Askaniya-Nova Biosphere Reserve	Ukraine
Lisa Kopsieker	German Federal Agency for Nature Conservation (BfN), Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection	Germany
Matthias Barth	HNEE	Germany
Jens Müller	HNEE	Germany
Angela Dichte	HNEE	Germany
Saleem Haddad	HNEE	Germany
Jürgen Peters	HNEE	Germany
Jon Chance	Biosphere Reserves Institute, HNEE	Germany
Denise Margaret Matias	Biosphere Reserves Institute, HNEE	Germany
Solomiia Hordasevych	Biosphere Reserves Institute, HNEE	Germany
Caroline Dabard	Biosphere Reserves Institute, HNEE	Germany
Vera Luthardt	Biosphere Reserves Institute, HNEE	Germany
Erik Aschenbrand	Biosphere Reserves Institute, HNEE	Germany
Yen-You Lin	Biosphere Reserves Institute, HNEE	Germany
Martin Welp	Biosphere Reserves Institute, HNEE	Germany
Ana Filipa Ferreira	Biosphere Reserves Institute, HNEE	Germany
Jana Gengelbach	Biosphere Reserves Institute, HNEE	Germany
Gino Carlo Garcia	Biosphere Reserves Institute, HNEE	Germany
Jannis Splieth	Biosphere Reserves Institute, HNEE	Germany
Josiane Lowe	Biosphere Reserves Institute, HNEE	Germany
Judith Kloiber	Biosphere Reserves Institute, HNEE	Germany
Carsten Mann	Biosphere Reserves Institute, HNEE	Germany
Heike Walk	Biosphere Reserves Institute, HNEE	Germany
Katja Arzt	Biosphere Reserves Institute, HNEE	Germany

5.3. Appendix 3 – Detailed Workshop Programme

Tuesday, 13th February 2024 Arriving Day, Registration and Welcome Reception 14:00 – 18:00 Location: Old Forest Academy Haus 4 (04.101), City Campus, Eberswalde University for Sustainable Development		
14:00 – 15:00	Registration	Mr. Yen-You Lin, BRI
15:00 – 15:15	Opening	Dr. Ana Filipa Ferreira, BRI; Prof. Dr. Erik Aschenbrand, BRI/HNEE
15:15 - 15:30	Welcome to the Eberswalde University for Sustainable Development!	Prof. Dr. Matthias Barth, HNEE President
15:30 - 15:45	The UNESCO MAB Program: A Key Priority for the Federal Agency for Nature Conservation (BfN)	Ms. Lisa Kopsieker, BfN
15:45 – 16:00	Introduction to the Biosphere Reserves Institute and the Eberswalde Declaration	Prof. Dr. Vera Luthardt, BRI/HNEE
16:00 – 16:30	Biosphere Reserves as model regions for transdisciplinarity? A literature review	Ms. Caroline Dabard, BRI
16:30 – 18:00	Getting to know each other	Mr. Yen–You Lin, BRI
Wednesday, 14th February 2024 Current Research Progress (research priorities, methodology and results), Research Gaps and Needs 9:00 – 17:30 Location: Old Forest Academy Haus 4 (04.101) City Campus, Eberswalde University for Sustainable Development		
9:00 – 9:10	Check-in	Mr. Yen–You Lin, BRI
9:10 – 9:20	Introduction of session 1: Current research progress (research priorities, methodology and results)	Prof. Dr. Erik Aschenbrand, BRI/HNEE
9:20 – 10:40	● Prof. Dr. Thomas Beery (Kristianstad University, Sweden): Biosphere Reserve Outdoor Recreation Research Potential ● Dr. Margherita Cisani (University of Padua, Italy): Landscape-as-heritage Making in the Italian Biosphere Reserves ● Mr. Arian Merolli (Transboundary Biosphere Reserve "Ohrid Prespa watershed, Albania, North Macedonia): Medical and Aromatic Plants in TBR Ohrid-Prespa watershed an opportunity	Moderator: Prof. Dr. Erik Aschenbrand, BRI/HNEE
10:40 – 11:00	Morning break	
11:00 - 11:40	Campus tour	Prof. Dr. Jürgen Peters, Dean, Faculty of Landscape Management and Nature Conservation, HNEE
11:40 – 13:00	● Ms. Iryna Yonash (Carpathian Biosphere Reserve, Ukraine): Scientific research and monitoring in the UNESCO Carpathian Biosphere Reserve (Ukraine) ● Dr. Aline Kühl-Stenzel (NABU, Germany): The critical role of research in policy: the case study of Wadden Sea	Moderator: Prof. Dr. Erik Aschenbrand, BRI/HNEE
13:00 – 14:00	Lunch break at city campus canteen (Haus 2)	
14:00 – 14:30	Group photo & coffee break	

14:30 – 14:40	Introduction of session 2: Research gaps and needs	Prof. Dr. Denise Margaret Matias, BRI/HNEE
14:40 – 16:10	• Prof. Dr. Marc Metzger (The University of Edinburgh, UK): Gaps and needs for research in, with and for UK Biospheres • Mr. Anatolie Risina (NGO Verde e Moldova, Moldova): Nature-based solution education in Biosphere Reserves • Mr. Antonio López Fernández (Biosphere Reserve Dehesas De Sierra Morena, Spain): Biosphere reserves in Andalucia (Spain), how we face low-visibility	Moderator: Prof. Dr. Denise Margaret Matias, BRI/HNEE
16:10 – 16:30	Afternoon break	
16:30 – 17:50	• Prof. Dr. Agita Livina (Vidzeme University of Applied Sciences, Latvia): Public misunderstanding of the Biosphere Reserve and low visibility of the Biosphere Reserve among citizens, politicians, and travellers • Dr. Lasha Khizanishvili (Agrarian University, Georgia): Three Alazani Rivers Biosphere Reserve. As a hotspot for scientific research	Moderator: Prof. Dr. Denise Margaret Matias, BRI/HNEE
17:50 – 18:00	Announcements for the excursion and the intercultural celebration	Mr. Yen–You Lin, BRI

Thursday, 15th February 2024 Excursion to Schorfheide–Chorin Biosphere Reserve (morning), Monitoring and Research Data Accessibility and Management (afternoon) 8:45–17:30 Location: BR Schorfheide–Chorin; Old Forest Academy Haus 4 (04.101); Haus 6 (Aula) City Campus, Eberswalde University for Sustainable Development		
8:45 – 9:00	Check-in & assembling (in front of Eberswalde Station)	Mr. Yen–You Lin, BRI
9:00 – 13:00	Excursion to Schorfheide–Chorin Biosphere Reserve	Prof. Dr. Erik Aschenbrand, BRI/HNEE & Dr. Benjamin Herold, BR Schorfheide–Chorin
13:00 – 14:00	Lunch break at city campus canteen (Haus 2)	
14:00 – 14:10	Introduction of the session 3: Monitoring and research data accessibility and management	Prof. Dr. Jens Müller, HNEE
14:10 – 15:40	• Mr. Andrew Bell (North Devon UNESCO Biosphere Reserve, UK): Research in North Devon and the opportunities: marine and or land-use, and or monitoring systems • Prof. Dr. João Vasconcelos (Instituto Politécnico de Leiria, Portugal): Monitoring tourism visitation in Berlengas Biosphere Reserve • Mr. Marko Tucakov (Institute for Nature Conservation of Vojvodina Province, Serbia): Monitoring White-tailed Eagle (Haliaeetus albicilla) in Mura-Drava-Danube Biosphere Reserve in 5 countries • Mr. Andreas Weiss (Wienerwald Biosphere Reserve Management, Austria): Wienerwald BR – our approach in collecting and disseminating monitoring and research data	Prof. Dr. Jens Müller, HNEE

15:40 – 16:10	Afternoon break	
16:10 – 17:30	Group discussion & activities	Prof. Dr. Jens Müller, HNEE
19:00 –	Intercultural celebration (Haus 6: Aula)	All participants
Friday, 16th February 2024 Exploring Research Collaborations, Closing Session 9:00–12:30 Location: Old Forest Academy Haus4 (04.101) City Campus, Eberswalde University for Sustainable Development		
9:00 – 9:10	Introduction of session 4: Exploring Research Collaborations	Dr. Ana Filipa Ferreira, BRI
9:10 – 10:45	• Dr. Nico Heitepriem (State Office for Environment Brandenburg - Spreewald BR, Germany): Current research in the UNESCO Spreewald B.R.: Understanding and implementing research as a collective task • Dr. Alberto Hernandez Salinas (MAB National Committee Spain, OAPN, Spain): Connection between national and regional scales in the MAB programme • Prof. Dr. Luis Santos (Polytechnic University of Tomar, Portugal): The natural evolution of Biosphere reserves, different countries with different speeds • Dr. Mari Carmen Romera Puga (UNESCOMED Centre – CTFC, Spain): UNESCOMED C2C: promoting collaborations, applied research and innovation in Mediterranean Biosphere Reserves. The case of the RES-MAB PRIMA project	Moderator: Dr. Ana Filipa Ferreira, BRI
10:45 – 11:00	Morning break	
11:00 – 11:50	Participatory workshop	Moderator: Dr. Ana Filipa Ferreira, BRI
11:50 – 12:20	Closing session	Moderator: Ms. Lisa Kopsieker, BfN

Note: The programme includes the titles of the presentations as initially proposed by the speakers and might be slightly different from the final titles as displayed in the abstracts (section 3).