Executive Summary

Heritage Guard Network Final Report

The Heritage Guard Network (HGN) initiative represents a new effort to safeguard cultural and natural heritage through crowdsourced digital preservation on Wikimedia platforms. With a focus on collaboration, the project has engaged stakeholders, including volunteers and institutional partners, to develop sustainable strategies for preserving at-risk heritage.

HGN aims to:

- Compile and share best practices for crowdsourcing data related to endangered heritage.
- Utilize Wikimedia platforms to enhance access and visibility of digital heritage records.
- Build partnerships to leverage diverse expertise and resources for preservation efforts.

The project has consisted of four working groups that have engaged experts and volunteers to explore central aspects of the thematic area: Engagement, Technology and Content, Legal and Copyright and Risks. Key insights from the working groups include:

Engagement:

- Psychological well-being and emotional connection are central to sustaining volunteer participation.
- Simplified user tools, personalized roles, and clear communication foster commitment and inclusivity.
- Institutional partnerships enrich volunteer efforts with professional insights, creating a resilient preservation ecosystem.

Technology and Content:

- Campaigns like Wiki Loves Monuments have demonstrated the power of crowdsourcing to document heritage.
- Better tools, 3D scanning and metadata integration are needed for comprehensive digital preservation.
- Strategic digitization initiatives can address significant data gaps and improve accessibility.

Legal and Copyright:

- Diverse copyright laws across regions create barriers to data sharing and volunteer contributions.
- Establishing legal safeguards and harmonizing copyright policies are necessary for cross-border collaboration.

Risk:

- Lessons from conflict-affected regions, like Ukraine, highlight the need for preemptive strategies in heritage documentation.
- Proactive measures, including damage assessment tools and data backups, enhance preservation efforts in crisis scenarios.

Conclusion

The HGN project underscores the power of collective action in preserving humanity's shared heritage. By integrating grassroots volunteer contributions with institutional expertise and leveraging digital innovation, the initiative offers a scalable model for global heritage preservation. Future efforts should prioritize inclusivity, strategic partnerships, and technological advancement to ensure the resilience and accessibility of cultural and natural heritage.

This comprehensive effort sets a precedent for collaborative digital preservation, empowering communities worldwide to protect and celebrate their heritage.

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Heritage Guard Network – Final Paper

"Heritage Guard Network (HGN): Empowering Communities to Safeguard Cultural and Natural Treasures through Crowdsourced Digital Efforts" aims to create long-term, sustainable networks that compile, build, and share best practices on how to successfully crowdsource data and information on cultural and natural heritage in danger.

More specifically, it aims to compile knowledge and develop best practices for how to use the Wikimedia platforms to digitally preserve and make available to the public cultural and natural heritage in danger. The project will create a large possibility for building partnerships, both within and outside the WikimFedia community, to this end. These partnerships will enable more efficient work to work strategically around what information to collect and combine to create the largest possible impact of the work and how to get hold of that information.

Parties to this project are the Wikimedia chapters in Poland, Ukraine, Georgia, and Sweden. All chapters have experience in working with, and building partnerships for, sharing heritage through the Wikimedia platforms. Poland and Sweden share a connection to the Baltic Sea, one of the world's most endangered seas, with a very sensitive biosystem. Georgia and Ukraine, on the other hand, share the imminent fate of having large parts of their territories occupied by Russia, making heritage preservation and digitization hard and often dangerous. The obvious and very unfortunate context of this project is the Russian invasion of Ukraine, and the overarching question: What would Wikimedia Ukraine have liked to have had in place before the war, for the successful and efficient digital preservation of cultural and natural heritage? What can others learn from Ukraine? What insights are gained? And what can we do to be better prepared, in the four countries and globally, as Wikimedians, when war, crisis, natural disasters, or indeed climate change threaten our heritage?

This project has focused on cultural and natural heritage in danger, building partnerships and sharing skills to make the heritage available freely online through the Wikimedia platforms. The two domains, natural and cultural heritage, face similar opportunities, challenges and risks when more information about them is made available online. The focus benefits from the strong experiences that some of the actors involved have to build capacity across the region, including Wikimedia Ukraine as international organizers of Wiki Loves Earth. Partnerships would include those between all Wikimedia affiliates involved in the project, the CEE hub and the Content Partnerships Hub, and the Wikimedia movement and relevant external actors.

This paper is the final paper of the project, documenting the insights gained through the four working groups that have laid the foundation of the work: Working groups on engagement, technology, legal, and risks. All working groups have engaged experts, partners, and volunteers, without whom this work would have been impossible.

Summary and general conclusions

The four working groups have worked independently, but through general check-ins and inter-working group meetings, synergies and connections between the focuses have been explored. Issues that underpin all insights include the complicated legal issues, notably copyright and related rights (including database rights) that are varying across the region, often overly restrictive, and phrased in complicated language. Another issue is the importance of working with 3D digitization, aerial documentation and other similar technology to stay relevant within the heritage preservation sector, but where Wikimedia platforms lack proper development and infrastructure and little guidance is given to volunteers. More specifically, the working groups propose to:

- Build bridges with institutional partners to promote a more professional heritage conservation through Wikimedia.
- Address technical barriers to remove barriers for volunteers.
- Collaborate and engage with indigenous and local communities to establish preservation and digitization efforts locally and ensure that local context and knowledge is reflected in the work.
- Explore further how partnerships, tools and automated processes can support and lower barriers for volunteers.
- Promote crowdsourcing e.g. through layered tools that visualize data and guidelines and checklists that support volunteer efforts.
- Develop Wikimedia models for prioritizing heritage preservations, based on models and strategies developed by heritage institutions but adapted for broader, community-driven projects.
- Advocate for harmonization of copyright policy across EU and neighboring areas, to enable cross-border crowdsourcing efforts and flow of content as well as to put volunteers in less complicated positions.
- Implement support systems, such as safety training, security measures and legal protections for volunteers and documentarians to facilitate efforts for preservation of heritage in danger, while maintaining the safety of everyone involved.
- Conduct more complex research on why Wikipedia and the other Wikimedia platforms are safe or unsafe for cultural and natural heritage preservation and how to mitigate risks with openness while promoting beneficial uses.
- Identify more effective ways to connect with institutions and experts to enhance the accuracy of our research. This could involve developing a targeted proposal or establishing partnership opportunities.

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Engagement

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In a world facing mounting threats to cultural and natural heritage – from environmental disasters to socio-political conflicts – the need for innovative preservation methods is more urgent than ever. Heritage assets, which embody the histories, cultures, and natural beauty of communities, are at significant risk, necessitating collaborative and accessible strategies to ensure their survival. The Heritage Guard Network (HGN) project addresses this challenge by empowering communities worldwide to protect and document their heritage digitally, employing Wikimedia platforms for crowdsourced preservation.

Central to HGN's mission is building an inclusive, resilient network that brings together both individual volunteers and institutional partners. Wikimedia's established reach and open-access resources create a powerful base for this initiative, allowing HGN to foster a diverse, collaborative space where knowledge about at-risk heritage can be shared freely. The project not only aims to make this knowledge accessible but also seeks to inspire community involvement, emphasizing that heritage preservation is a shared responsibility that transcends geographical and cultural boundaries.

The Engagement Working Group has focused on identifying strategies that effectively mobilize volunteers and sustain long-term partnerships. For volunteers, factors such as emotional connection to heritage, ease of digital access, and fulfilling participation experiences are essential for engagement and retention. The Working Group found that aligning volunteer roles with personal values and creating an inclusive community significantly enhances motivation and commitment. This community-driven model empowers volunteers to contribute meaningfully, knowing their efforts directly support the preservation of heritage that matters to them.

Simultaneously, the project recognizes the essential role of institutional partnerships, which provide expertise, validation, and extended reach. HGN collaborates closely with regional Wikimedia affiliates, GLAM institutions (Galleries, Libraries, Archives, and Museums), and other external organizations dedicated to heritage conservation. These partnerships expand the network's capabilities, enabling it to combine volunteer-driven contributions with professional insight and resources. By integrating institutional guidance and grassroots volunteer energy, HGN aims to establish a sustainable model that enhances heritage preservation efforts on a global scale.

This report presents the findings and strategic insights from the Engagement Working Group, offering best practices for creating a thriving, collaborative digital ecosystem for heritage preservation. With a commitment to fostering both individual and institutional involvement, HGN envisions a future where safeguarding heritage is a collective mission accessible to all.

Summary

The Heritage Guard Network (HGN) Engagement Working Group has identified a range of critical insights that inform its strategy for building a sustainable, community-driven model for heritage preservation. These findings emphasize the importance of fostering both individual and institutional participation, leveraging Wikimedia's digital tools, and creating an accessible, inclusive environment that resonates with volunteers' motivations and values. By understanding the unique role of emotional connection in volunteer engagement, addressing technical barriers, and incorporating diverse perspectives—including indigenous knowledge—HGN aims to build a resilient network of contributors. Institutional partnerships add further depth, bridging professional expertise with volunteer-driven efforts to create a comprehensive preservation platform. Advanced digital tools, such as AI-based damage assessment and 3D scanning, further strengthen HGN's capacity to document and protect heritage, particularly in areas affected by conflict or natural disasters. Together, these insights guide HGN in cultivating an engaged community dedicated to the preservation of cultural and natural heritage worldwide.

1. **Volunteer Engagement and Psychological Well-being**

Sustaining volunteer engagement requires more than task-related commitment; it hinges on fostering psychological well-being. The Engagement Working Group found that volunteers remain active and loyal to HGN when they feel an emotional attachment to the organization and its mission. This loyalty is bolstered by meaningful, well-defined roles that resonate with volunteers' values and interests. Providing volunteers with purposeful tasks that align with their personal goals enhances satisfaction, making them more likely to stay involved long-term. This insight emphasizes the importance of structuring volunteer roles in a way that not only contributes to heritage preservation but also offers personal growth and fulfillment.

2. **Emotional Connection as a Key Motivator for Heritage Preservation**

Volunteers are most motivated when they feel an emotional connection to the heritage they are helping to preserve. This connection often derives from a shared cultural memory, historical awareness, or personal significance associated with the heritage. The sense of preserving something of enduring value fosters a deeper sense of responsibility, encouraging volunteers to remain engaged. For HGN, recognizing and reinforcing this emotional connection can be a powerful tool to maintain volunteer interest. Volunteers who perceive their contributions as meaningful and aligned with their own sense of identity are more likely to feel a commitment to the cause.

3. **Accessible, User-Centered Digital Tools for Volunteer Engagement**

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Digital tools designed with user-friendliness in mind significantly lower participation barriers and increase sustained involvement. The group identified that a user-centered approach, particularly through a volunteer app or streamlined digital platform, reduces entry hurdles for both new and existing contributors. By focusing on intrinsic motivators (such as personal satisfaction, ease of contribution, and community support), social proof, and regular feedback, user-centered digital tools can make participation more accessible and satisfying. The group noted that intuitive design and accessibility features help create an inclusive environment, ensuring that heritage preservation feels approachable to a broad audience.

4. **Wikimedia's Crowdsourcing Capabilities as a Preservation Tool**

The Wikimedia ecosystem provides a strong foundation for HGN's digital preservation efforts. Wikimedia Commons and related platforms allow for the documentation, organization, and public sharing of heritage images, data, and narratives. Initiatives like Wiki Loves Monuments. Wiki Loves Earth and Wiki Loves Folklore serve as successful models, engaging photographers, writers, and data enthusiasts to contribute heritage-related content. These projects have shown that people are eager to document heritage and that Wikimedia's tools can make the process straightforward. Such initiatives illustrate how Wikimedia can function as both a preservation platform and a means to expand public engagement with heritage.

5. **Institutional Partnerships Enhance Reach, Expertise, and Validation**

Institutional collaborations bring invaluable expertise, resources, and networks to HGN, amplifying the reach and credibility of crowdsourced contributions. Partnering with GLAM organizations, regional Wikimedia affiliates, and heritage institutions bridges the gap between professional conservation practices and volunteer-driven documentation. These partnerships also lend validation to HGN's efforts, attracting additional stakeholders who may otherwise hesitate to participate. By working closely with institutional partners, HGN can ensure that volunteer contributions meet professional standards, thereby enhancing the accuracy and utility of the preserved data.

6. **Creating an Ecosystem of Diverse Stakeholders for Comprehensive Engagement**

HGN benefits from engaging a diverse array of stakeholders, each contributing unique skills and perspectives. This "ecosystem" approach emphasizes the importance of defining roles for different stakeholders, including community leaders, conservation experts, students, and citizen scientists. By acknowledging the distinct contributions that each group can make, HGN can design engagement strategies that leverage these strengths effectively. Customized engagement for each type of stakeholder ensures that their participation is impactful, relevant, and rewarding, ultimately creating a more resilient and adaptive heritage preservation network.

7. **Addressing Technical Barriers to Improve Volunteer Access**

Technical know-how, or lack thereof, can be a significant barrier to volunteer engagement, especially among newcomers. Many volunteers may feel intimidated by Wikimedia Commons' uploading process or unsure of copyright policies. Addressing these technical barriers by offering clear, accessible guidance on using Wikimedia tools, uploading content, and understanding free licenses can make participation smoother and less daunting. For example, demonstrating how easily images can be transferred from Flickr to Wikimedia Commons could encourage broader contributions. This approach is particularly useful for attracting skilled contributors like photographers, who may have concerns about copyright or the technicalities of digital contribution.

8. Building Community and Recognizing Volunteer Contributions

A sense of community is essential to sustaining long-term engagement. Volunteers feel more motivated and committed when their contributions are recognized and appreciated by their peers and project leaders. Regular feedback, recognition, and opportunities for peer interaction foster a supportive environment where volunteers feel valued. Design elements such as visible user profiles, progress indicators, and social reinforcement (e.g., acknowledgment from other community members) contribute to a positive volunteer experience. By reinforcing a sense of belonging and accomplishment, HGN can maintain a motivated volunteer base that feels invested in the network's goals.

9. Integrating Indigenous Knowledge and Oral Traditions into Documentation

Indigenous communities often possess deep-rooted, oral knowledge about cultural and natural heritage. The Engagement Working Group highlighted the value of incorporating this knowledge, which is frequently passed down through generations and holds unique cultural insights. By inviting indigenous and local communities to contribute their knowledge, HGN can create a more holistic representation of heritage that respects and acknowledges these traditional narratives. Engaging indigenous communities also strengthens ties between the project and local cultural custodians, ensuring that diverse forms of heritage are included in preservation efforts.

10. Utilizing Advanced Digital Tools for Heritage Documentation and Restoration

Emerging technologies, such as 3D scanning, digital modeling, and AI-based assessment tools, offer new ways to document and restore heritage sites, particularly those impacted by natural disasters or conflicts. Tools like the Heritage Damage Assessment Demo (mentioned in project discussions) provide efficient ways to evaluate damage and create digital backups, allowing for restoration even after destruction. These technologies are especially valuable in conflict zones, where heritage structures may be at high risk. By integrating such tools into HGN's efforts, the project can enhance its preservation capabilities and create digital archives that serve as both cultural records and resources for future conservation.

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Review of Literature

The Heritage Guard Network (HGN) Engagement Working Group has engaged in extensive discussions on volunteer engagement, heritage preservation, and the integration of digital tools for community-driven preservation. This section synthesizes the internal discourse within the Wikimedia movement, as well as insights from partners and existing literature, to provide a comprehensive review of the concepts and research informing HGN's approach.

Within the Wikimedia community, volunteer engagement has been an ongoing focus, particularly in projects such as Wiki Loves Monuments. Wiki Loves Earth and Wiki Loves Folklore, which encourage public documentation of cultural and natural heritage through photography and data contributions primarily on Wikimedia Commons. These initiatives have provided valuable insights into the motivational factors driving volunteer participation and the challenges of retaining contributors over time. Discussions within the Working Group highlighted that emotional connection to heritage and a sense of personal relevance are key motivators for volunteers. Research shared in the group supported this view, indicating that volunteer engagement is often linked to psychological well-being and emotional attachment to the cause, rather than merely a sense of duty.

A significant contribution to the Working Group's understanding came from Pakhee Kumar's research, which has been especially useful in shaping HGN's approach. Her work focuses on the intersections of heritage preservation, crowdsourcing, and volunteer motivation, offering practical insights into why people engage in preservation efforts. Kumar's studies highlight the importance of fostering a strong emotional connection between volunteers and the heritage they seek to protect. This aligns with HGN's approach, suggesting that volunteers remain more committed when they experience both organizational loyalty and fulfillment through meaningful contributions. In this regard, HGN aims to cultivate an environment where volunteers feel a deep connection to the heritage they are preserving, making their engagement more personal and sustainable.

The Working Group also explored relevant literature on user-centered design and its role in enhancing engagement on digital platforms. Studies indicate that lowering entry barriers and creating accessible, intuitive user experiences can significantly enhance volunteer engagement. By focusing on elements like intrinsic motivation, social proof, and feedback, digital platforms can make heritage preservation more appealing and manageable for a wide range of contributors. This literature aligns with HGN's commitment to designing a volunteer experience that feels inclusive and straightforward, ensuring that all contributors – regardless of their technical expertise – can engage effectively with preservation efforts.

Additionally, the integration of indigenous knowledge and oral history documentation was a recurring topic in group discussions. Members emphasized that traditional knowledge, often passed through generations orally, is an invaluable component of cultural heritage. Research on indigenous knowledge systems and participatory documentation highlights the importance of respecting and accurately representing these perspectives, especially in

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digital archives. HGN aims to incorporate this by inviting indigenous communities to share their unique heritage insights, thereby fostering a more comprehensive and authentic representation of global heritage.

In terms of technological approaches, the Working Group discussed advanced digital tools like 3D scanning, AI-driven assessments, and digital modeling. The potential of these tools for heritage preservation has been widely acknowledged, particularly in the literature on disaster recovery and cultural heritage protection in conflict zones. For instance, recent research on heritage damage assessments suggests that AI and 3D technologies can provide accurate documentation, enabling restoration efforts even when physical heritage is compromised. HGN's exploration of these technologies aligns with this body of research, as the project seeks to employ cutting-edge tools to enhance the accuracy, accessibility, and resilience of its preservation efforts.

In summary, the literature and discussions within the Wikimedia movement and HGN's partner network reveal that successful heritage preservation relies on a blend of emotional engagement, accessibility, and innovative technology. By drawing on these insights – particularly Kumar's research on crowdsourcing and emotional connection – HGN could develop a community-driven model that addresses both the technical and motivational needs of volunteers, while recognizing the critical role of diverse cultural narratives in heritage preservation. This approach would position HGN at the intersection of community engagement and technological innovation, embodying the Wikimedia movement's mission to make knowledge freely accessible and inherently human.

Here is a list of most important papers and projects that were analyzed by the working group:

Table 1: Research Papers and Articles

Author/Source	Title	Description	Key Insights for Engagement
Emma Gudmunds & Lovisa Tegelberg	Volunteer Engagement through UX Design	Study focusing on a user-centered app to enhance volunteer engagement, reducing barriers and increasing motivation.	Highlights the importance of intrinsic motivation, social proof, and continuous feedback.
Maria Vecina et al.	Volunteer Engagement and Organizational Commitment	Research on factors that retain volunteers, emphasizing the importance of psychological well-being and emotional connection.	Stresses fostering a deep emotional commitment and an engaging experience for sustained effort.

Pakhee Kumar	Heritage Damage Assessment Tool	Tool developed to assess heritage damage; explores using AI and tech for cultural preservation in crisis contexts.	Useful for integrating technological tools to document and protect heritage in high-risk zones.
Pakhee Kumar	Research on Heritage Safeguarding via Crowdsourcing	Focused on heritage protection in disasters; explores how emotional connection and memory drive volunteer participation.	Emphasizes the need for volunteers to connect emotionally with heritage to sustain engagement.
Mowday, Porter, & Steers (1974)	Organizational Commitment	Study on factors driving organizational commitment, covering emotional attachment and loyalty to institutions.	Guides strategies to strengthen volunteer loyalty and organizational commitment.
Pakhee Kumar	Crowdsourcing to Rescue Cultural Heritage during Disasters: A Case Study of the 1966 Florence Flood	Explores how crowdsourcing can aid in disaster recovery, focusing on cultural heritage preservation efforts following the Florence flood.	Highlights the role of public engagement and emotional connection to heritage in effective crowdsourced recovery.
Pakhee Kumar et al.	Detection of Disaster-Affected Cultural Heritage Sites from Social Media Images Using Deep Learning Techniques	Uses AI and crowdsourced data from social media to assess damage to heritage sites post-disaster.	Demonstrates the potential of combining crowdsourcing with AI for timely and efficient damage assessment.

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Pakhee Kumar	Twitter, Disasters, and Cultural Heritage: A Case Study of the 2015 Nepal Earthquake	Analyzes tweets to understand public response to cultural heritage damage during the Nepal earthquake.	Emphasizes the importance of social media as a rapid-response tool for heritage preservation and public awareness.
Pakhee Kumar	Social Media, Crowdsourcing, and Disasters Affecting Cultural Heritage	Examines how social media platforms can be utilized to mobilize resources and volunteers in disaster contexts.	Provides insights into leveraging social media for real-time information gathering and volunteer engagement.

Table 2: Case Studies and Projects

Author/Source	Title	Description	Key Insights for Engagement
Wikimedia Switzerland	Afghanistan Antiquities at Risk	Wikimedia CH project documenting Afghan heritage under threat, through crowdsourced initiatives.	Demonstrates effective institutional engagement with volunteers for high-impact heritage work.
Zooniverse	Citizen Science Platform	Crowdsourcing platform allowing volunteers to contribute to scientific research, including heritage-related projects.	Offers insights on scaling volunteer participation and engagement via crowdsourcing tasks.

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FromThePage	Transcription and Annotation Platform	Platform for crowdsourced transcription of historic documents, aiding preservation and accessibility of cultural records.	Shows the potential for using transcription tasks to engage volunteers in heritage projects.
NEMO - Network of European Museum Organisations	European Museum Network	Collaborative network supporting museums in digitizing collections and engaging volunteers across borders.	Provides a model for transnational collaboration and knowledge sharing in heritage protection.
Wikimedia	Wiki Loves Monuments	Annual photography competition to document and preserve cultural heritage monuments globally, hosted on Wikimedia Commons.	Demonstrates the potential of large-scale public participation to document cultural heritage sites across countries.
Wikimedia	Wiki Loves Earth	Photo contest to promote natural heritage preservation by documenting protected areas, hosted on Wikimedia Commons.	Engages a global audience in environmental preservation by encouraging visual documentation of nature reserves and protected areas.

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Wikimedia	[Wiki Loves Folklore]()	Photo and media competition focused on preserving and sharing global folklore and cultural traditions on Wikimedia Commons.	Encourages crowdsourced documentation of intangible cultural heritage, fostering appreciation for diverse folklore traditions.

Methods.

The development of this paper relied on a combination of collaborative discussions, expert insights, and extensive research. The core findings emerged through working group meetings, where members shared their experiences, discussed challenges, and analyzed engagement strategies relevant to heritage preservation. To further enrich these discussions, we conducted individual conversations with experts from both the Wikimedia community and external organizations, bringing in specialized knowledge on topics such as digital preservation, volunteer engagement, and indigenous heritage.

Desk research played a crucial role, providing a foundational understanding of existing literature on crowdsourcing, organizational commitment, and heritage documentation. Each volunteer joining the working group completed an initial survey, enabling us to capture diverse perspectives and better understand the motivations and backgrounds of our contributors. In addition, networking at thematically relevant conferences allowed the group to connect with professionals in fields such as conservation, digital heritage, and community engagement, offering practical insights that informed our strategies.

To validate and contextualize these insights, we analyzed case studies from existing Wikimedia initiatives, such as Wiki Loves Monuments, and drew on real-world examples of heritage preservation projects around the world. This multifaceted approach ensured that the findings and recommendations in this paper are grounded in both theoretical knowledge and practical experience, creating a well-rounded foundation for the Heritage Guard Network's ongoing work.

Conclusion

The Heritage Guard Network (HGN) project demonstrates that preserving cultural and natural heritage in the digital age relies on a combination of community engagement, strategic partnerships, and technological innovation. This project has shown that an inclusive, collaborative approach—one that empowers volunteers and draws on institutional expertise—can create a resilient framework for safeguarding at-risk heritage. Through our work, we gained crucial insights into the motivations, needs, and challenges that underpin successful engagement efforts. Volunteers are driven by a deep emotional connection to heritage and a desire for meaningful involvement, underscoring the importance of designing accessible, fulfilling experiences that align with their values. In parallel, partnerships with GLAM institutions, other likeminded organizations, and regional Wikimedia affiliates offer HGN professional validation, resources, and credibility, expanding the project's impact.

To address the primary challenge of sustaining volunteer and partner engagement, HGN has identified several solutions. Firstly, lowering technical barriers and creating user-centered digital tools make participation easier, enabling contributors to share knowledge with fewer obstacles. Additionally, emphasizing emotional connection, providing clear guidance, and offering consistent recognition help foster a loyal, motivated community. For institutional collaborations, building on shared goals and leveraging each partner's unique strengths ensure that these relationships remain mutually beneficial, maximizing resources and expertise.

Key lessons learned include the importance of aligning volunteer roles with personal motivations and the value of combining grassroots contributions with institutional support. The inclusion of indigenous perspectives and oral knowledge also highlighted the need to respect and integrate diverse narratives in heritage preservation. Finally, advanced digital tools such as 3D scanning and AI-based assessments offer new possibilities for heritage documentation and restoration, particularly in areas affected by conflict or disaster. Moving forward, HGN will continue to refine its engagement strategies, aiming to expand its network and deepen its impact. By fostering an inclusive, community-centric approach, HGN contributes to a future where preserving cultural and natural heritage is a shared, accessible responsibility that empowers communities worldwide.

Reflections

The Heritage Guard Network (HGN) project powerfully embodies the Wikimedia Movement's latest tagline, **"Knowledge is Human".** Through HGN, we see how knowledge is more than just data or information - it is an expression of community, memory, and shared values. Heritage preservation, as pursued by HGN, brings this vision to life by recognizing that knowledge about cultural and natural heritage is inherently human, carrying with it the stories, emotions, and identities of the people connected to it. This project reminds us that safeguarding heritage is not only about archiving history but also about preserving the human connections that give it meaning.

One of the central lessons of HGN is the importance of emotional connection as a catalyst for volunteer engagement. Volunteers, as stewards of heritage, are driven by a sense of personal responsibility and passion, illustrating how knowledge is deeply human when it resonates with personal values and shared histories. Going forward, the Wikimedia

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movement and its partners can strengthen this connection by developing more personalized roles, recognition systems, and supportive communities that amplify volunteers' sense of purpose. This human-centered approach can transform Wikimedia platforms into spaces where people not only contribute knowledge but feel a meaningful part of a global effort to honor and protect what matters to them.

HGN also highlights the need to include diverse forms of knowledge, especially indigenous and local perspectives. Traditional knowledge often exists beyond written records, carried through generations in oral histories, rituals, and lived experiences. By making space for these voices, Wikimedia and its partners affirm that human knowledge is multifaceted, encompassing more than what is typically documented. Building bridges to indigenous and local communities, and empowering them to share their perspectives, is essential to creating a truly inclusive and respectful digital preservation effort that reflects humanity's full range of heritage.

Looking to the future, HGN and its partners are well-positioned to harness emerging technologies, such as AI-driven assessments, 3D scanning, and digital modeling, which enable more resilient and comprehensive documentation of at-risk heritage. These tools enhance HGN's capacity to preserve knowledge not just as static information but as immersive experiences that reflect the dynamic, human stories behind each site or artifact. With these tools, HGN can continue to preserve knowledge in ways that honor the humanity embedded in each piece of heritage, particularly in regions facing environmental or political threats.

Ultimately, HGN's work offers a model for a preservation approach that recognizes the human spirit as central to the safeguarding of knowledge. By balancing grassroots volunteer contributions with institutional support, HGN not only strengthens heritage preservation efforts but also upholds the Wikimedia movement's commitment to making knowledge accessible, participatory, and deeply human. As HGN expands, it exemplifies a future where preserving our shared heritage is a collective endeavor, inviting communities worldwide to connect, contribute, and celebrate the knowledge that defines us all.

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Technology and content

Wikipedia and the other Wikimedia platforms are important gateways to cultural and natural heritage.[1] Since heritage institutions, such as museums, archives, and libraries, experience a large increase in traffic to their websites when sharing their content on the Wikimedia platforms, such involvement has become increasingly common.[2] Wikimedians, in general, aim to gather the sum of human knowledge; Wikipedia, in particular, to build an encyclopedia. Despite the endeavor, the platforms do not, however, merely represent objective, neutral facts. As noted by Pentzold et. al., the quality of Wikipedia "is made possible by struggle over its content."[3] This struggle, which could be called collaborative knowledge production, impacts the digital representation, structure, and prioritization of heritage sites: which sites are included, which are excluded, and how they are represented.

This prioritization is an essential part of a larger ecology of digital knowledge production around heritage sites, eventually impacting which heritage sites are preserved. Pentzold et. al. recognizes Wikipedia "as an increasingly canonical platform for the documentation and construction of knowledge about material and immaterial cultural heritage that goes beyond other forms of social media in terms of structure, comprehensiveness and transcultural scope,"[4] which puts a large responsibility on the shoulders of Wikipedians and other Wikimedians.

When Russia invaded Ukraine in February 2022, such questions came to the forefront of the Wikimedia movement's projects around cultural and natural heritage. How can the Wikimedia movement better leverage the technology of the platforms to contribute to the, albeit digital, preservation of cultural and natural heritage, especially heritage in danger? How can we gather insights from Wikimedia Ukraine and Ukrainian experts to help other countries in the region, as well as globally, better prepare for conflicts, wars or the impact ofclimate change? What can volunteer editors do, and how can Wikimedia affiliates and other free knowledge organizations empower and support them? How can a volunteer-based crowdsourcing movement effectively rise to the challenge and support essential yet under-funded professional efforts to digitally reproduce heritage sites and their contents? And what data do we need to this end?

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[1] See e.g. P. Burke. 2012. *A Social History of Knowledge II. From the Encyclopaedia to Wikipedia*. Polity Press, Cambridge, England.
[2] Kelly, E. J. (2019). Reuse of Wikimedia Commons Cultural Heritage Images on the Wider Web. *Evidence Based Library and Information Practice,* 14(3), 28–51. https://doi.org/10.18438/eblip29575
[3] C. Pentzold, E. Weltevrede, M. Mauri, D. Laniado, A. Kaltenbrunner, E. Borra. 2017. Digging Wikipedia: The online encyclopedia as a digital cultural heritage gateway and site. *ACM Journal on Computing and Cultural Heritage,* Vol. 10, No. 1, Article 5, (March 2017). http://dx.doi.org/10.1145/3012285
[4] This ecology of digital knowledge production around heritage sites involve online social networks and social media platforms (such as Facebook and Instagram), multimedia sharing platforms, and digital libraries; from a cultural heritage perspective it might include aggregators such as Europeana, and from a natural heritage perspective digital platforms such as WildBook and from a Swedish perspective e.g. Artdatabanken. See e.g. Pentzold et. al. (2017).

Summary

This paper thus aims to analyze how, and to what extent, the Wikimedia movement can support a professional cultural and natural heritage documentation through the Wikimedia platforms, while maintaining the unique volunteer-based approach that dominates the work. In other words, how can technology and content be used to enable Wikimedians to do efficient and professional work, while lowering barriers for newcomers and non-professionals to join the work? This paper analyzes the current situation and needs, and proposes some measures for the future.

Initiatives such as Wiki Loves Monuments (WLM) and Wiki Loves Earth (WLE) have successfully mobilized volunteer efforts, creating valuable crowdsourced media that aids in education, research, and preservation. However, challenges persist, including significant data gaps, technical barriers, and unclear intellectual property rights. Further technological development is needed to boost volunteer involvement and improve data quality. The paper underscores the importance of comprehensive data for prioritizing heritage documentation, especially in crisis situations, such as the ongoing war in Ukraine. A shift towards more strategic digitization is needed, including improved data – such as the use of Structured Data on Commons (SDC) – and technology, but also paving the way for 3D digitization and other new or emerging formats. Addressing these needs will empower volunteers, enrich digital content, and increase the reach and reuse of heritage data on the Wikimedia platforms. By focusing on improving technological tools and data for community engagement, partnerships, visualization, and reach, the Wikimedia movement can bridge existing data gaps, expand access, and support the global conservation of heritage more effectively.

Review of Literature

Wiki Loves Monuments and Wiki Loves Earth

The Wikimedia movement is becoming increasingly invested in digital preservation of cultural and natural heritage, e.g. by making data and multimedia content of cultural and natural heritage sites immediately and openly available. This open access, in turn, promotes greater and better accessibility to common heritage, contributing to a better digital representation of the world.[5]

Over the last decade, a strong foundation for digital heritage preservation has been laid through the two content creation campaigns Wiki Loves Monuments (WLM) and Wiki Loves Earth (WLE), where digital reproductions of protected cultural and natural heritage respectively are crowdsourced. WLM has to date crowdsourced reproductions of more than 1.6 million objects of built cultural heritage from 93 countries, uploaded by more than

[5] Pensa, I., & Pucciarelli, M. (2022). Wikipedia and cultural tourism. In *Handbook on Heritage, Sustainable Tourism and Digital Media* (pp. 25-35). Edward Elgar Publishing.

This project is funded by the Swedish Institute.

86,000 participants.[6] WLE annually results in roughly 100,000 photos of natural heritage, produced by close to 10,000 participants in more than 30 countries.[7] The value of these reproductions has been highlighted by many professionals.[8] The reproductions are valuable as illustrations in Wikipedia articles, but equally for preservation purposes, especially in cases or countries where national authorities or professionals lack resources for documenting and digitizing built heritage and heritage sites themselves;[9] they are also of increasing relevance for research on an aggregated level, due to the information and metadata they carry and the connections that can thereby be made.[10]

Wikimedia campaigns in times of crises

Wikimedia communities are increasingly discussing preservation efforts in relation to crises such as war, conflict, and climate change. Such discussions involve e.g. cultural heritage institutions (GLAMs) and crises, highlighting the importance of local contexts and digital strategies to combat complete losses if crises occur.[11] The organizers of WLE have introduced a specific category for human rights and the environment, in collaboration with the Office of the High Commissioner for Human Rights (OHCHR).[12] After the fire in the National Museum of Brazil in 2018, where around 20 million items were lost, Wikimedia crowdsourcing efforts led to the upload of thousands of images to Wikimedia Commons to preserve the memory of items destroyed or impacted by the fire.[13] Equally, after the Russian invasion of Ukraine, the WLM team in Ukraine introduced a dedicated category for documenting Russia's destruction of Ukrainian cultural heritage. During the 2024 iteration of the campaign, participants submitted 417 images depicting destroyed heritage from all parts of Ukraine.[14] Wikimedia Ukraine has had to take a lot of measures to promote the digital reproductions of heritage sites, while ensuring the safety of their volunteers.

Even though the conversations have stressed the importance of strategic planning and proactive efforts, the Wiki Loves campaigns and other crowdsourcing efforts remain relatively loosely coordinated. The following sections aim to identify ways and means for more professional and strategic work.

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[6] Azizifard, N., Gelauff, L., Gransard-Desmond, J. O., Redi, M., & Schifanella, R. (2022). *Wiki loves monuments: Crowdsourcing the collective image of the worldwide built heritage*. ACM Journal on Computing and Cultural Heritage, 16(1), 1-27 <https://dl.acm.org/doi/full/10.1145/3569092>.
[7] Segault, A. (2022). Community animation in participatory cultural projects: Lessons from the Wiki Loves Monuments photography contests. *Hybrid. Revue des arts et médiations humaines*, (8).
[8] See e.g. Azizifard et. al. (2022).
[9] See also eg. the presentation of Ny Björn Gustafsson at the Swedish National Heritage Board during the Wikipedia Day 2021: https://www.youtube.com/live/-ohZGjvqEn4?si=LPJueeTf2IREvov-&t=3600
[10] Azizifard et. al. (2022).
[11] Susanna Ånäs et. al., "Crisis and GLAM", Meta Wiki, 22 August 2022, <https://meta.wikimedia.org/wiki/Crisis_and_GLAM>
[12] Lukaniuk, Olesia, "Wiki Loves Earth 2024 Presents the Special Nomination Human Rights and Environment", 21 March 2024, Wiki Loves Earth blog <https://wikilovesearth.org/wiki-loves-earth-2024-presents-the-special-nomination-human-rights-and-environment/>
[13] Kumar, Pakhee, Crowdsourcing to rescue cultural heritage during disasters: A case study of the 1966 Florence Flood, *International Journal of Disaster Risk Reduction*, Volume 43, 2020, 101371, ISSN 2212-4209,
[14] Protsiuk, Anton, "War destroys monuments. The toll of Russian invasion of Ukraine in a Wiki Loves Monuments special category", 5 April 2024, *diff.wikimedia.org*.
<https://diff.wikimedia.org/2024/04/05/war-destroys-monuments-the-toll-of-russian-invasion-of-ukraine-in-a-wiki-loves-monuments-special-category/> See also the Category: Wiki Loves Monuments in Ukraine 2023 – War:
<https://commons.wikimedia.org/wiki/Category:Wiki_Loves_Monuments_in_Ukraine_2023_-_War>

Data

As Karen Bakker highlights in *Gaia's Web,* "the tsunami of digital data" has sparked rapid innovation in both data analytics and open-source projects (in her context from a biodiversity point of view).[15] There are however large geographical and topical discrepancies in terms of available datasets on both cultural and natural heritage sites. Projects such as FindingGLAMs and Connected Open Heritage have attempted to compile data on cultural heritage institutions and built cultural heritage sites from already existing datasets, but success has been heavily restricted by the lack of existing datasets, especially in certain parts of the world.[16] Uncertainty about the copyright status of datasets, and limited resources to investigate IP rights of the institutions holding the data, have also hindered the integration of such data with the Wikimedia platforms. When it comes to data on protected nature and natural heritage sites, the situation is similar. For instance, UNEP administers "Protected Planet", a global database of protected nature areas, aggregating datasets from all member countries. In many jurisdictions, this kind of data is non-copyrightable, or released without copyright restrictions. The Swedish Environmental Protection Agency releases all such data as open data, according to their policy for reuse of information.[17] UNEP, however, claims exclusive rights on their aggregated database and related reports.[18]

The question of what is covered by exclusive rights is complex. Facts and data are typically not covered by copyright, as it does not fulfill the 'originality criteria' (where a work must be the original work of the author).[19] Several jurisdictions, including the EU, have however introduced *sui generis* database rights on aggregated databases, to recognise the investment made in the compilation.[20] The EU Database Directive[21] offers protection for databases that are "systematically or methodically arranged and individually accessible". Owners thus have the exclusive right to extract or reuse substantial parts of the content in the database, as well as repeated and systematic extraction of non-substantial parts. It is however not clear what a "substantial part" is, nor what constitutes a "repeated and systematic extraction of non-substantial parts", making it risky to use databases without permission from rightsholders,[22] such as through a CC0 mark.

Wikidata, the structured linked database of the Wikimedia movement, requires a CC0 mark for data to be added, i.e. that all rights permissible under national law are waived.[23] This is different than Wikipedia, which is published under a more restrictive CC BY-SA license (requiring attribution and share-alike). That means information from e.g. CC BY-SA reports can be directly copied to Wikipedia, but not to Wikidata if the information is in the form of

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[15] Bakker, Karen J., *Gaia's web: how digital environmentalism can combat climate change, restore biodiversity, cultivate empathy, and regenerate the Earth*, The MIT Press, Cambridge, Massachusetts, 2024[2024], p. 34.
[16] See Editors, "White Paper", *FindingGLAMs*, MediaWiki, <https://meta.wikimedia.org/wiki/FindingGLAMs/White_Paper>
[17] Naturvårdsverket, "Policy för vidareutnyttjande av Naturvårdsverkets data eller information", 8 June 2017, <https://commons.wikimedia.org/wiki/File:Policy_f%C3%B6r_vidareutnyttjande_av_Naturv%C3%A5rdsverkets_data_eller_information.pdf>
[18] UNEP-WCMC and IUCN (2024). Protected Planet Report 2024. UNEP-WCMC and IUCN: Cambridge, United Kingdom; Gland, Switzerland. <https://pp-digital-report-files.s3.us-east-1.amazonaws.com/Protected+Planet+Report+2024.pdf>
[19] See e.g. DIRECTIVE (EU) 2019/790 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, recital 9.
[20] Colston, Catherine. "Sui generis database right: ripe for review?." *Journal of Information, Law and Technology* 2001.3 (2001).
[21] The EU Directive 96/9/EC on the legal protection of databases
[22] Legal review by Dentons Law Firm, 6 September 2022, not published.
[23] https://www.wikidata.org/wiki/Wikidata:Licensing

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longer strings, or if the use is of a repeated nature.[24] This is even though, in practice, much information is copied from Wikipedia to Wikidata,[25] despite the fact that Wikipedia's CC BY-SA license and Wikidata's CC0 mark are incompatible. McDowell and Vetter call this phenomenon the 'realienation' of the Commons, claiming the ecosystem after the introduction of Wikidata has led to an 'extraction', 'reappropriation' and 'commodification' "beyond the intent of its original creators."[26] The incompatibility of the licenses and potentially negative effects highlight the importance of adding freely licensed datasets directly to Wikidata, enriching the entire ecosystem, rather than merely moving information from Wikipedia to Wikidata. It is also vital in order to provide references to the origin of the data, something which the Wikidata community in itself is passionate about.[27]

Adding datasets to Wikidata, or in the case of e.g. shapefiles to Wikimedia Commons, is also a way of linking databases together, ensuring original data is reflected on Wikidata and from Wikidata on the other Wikimedia platforms. If information is added first to Wikipedia and then from Wikipedia to Wikidata, any changes in the original data must be manually changed on both platforms.[28] Adding data directly from datasets to Wikidata thereby increases provenance.[29] Interestingly, research indicates a difference between references on Wikipedia and Wikidata, where news articles dominate references on Wikipedia, while government reports and data dominate references on Wikidata. Crowdsourced-based engagement on Wikidata diversifies the references used but also enriches information government open data,[30] such as open geodata where volunteers repeatedly discover errors in coordinates. Digitized heritage items also often lack well-developed metadata, with relatively short descriptions and a lack of rich, contextual information. As Azizifard et. al. have shown, "crowdsourcing mechanisms have been widely adopted to enrich the information about cultural heritage by soliciting input from the community."[31] Adding data from datasets to Wikidata can in this way be a way of, through crowdsourcing, improving and enriching the source data as well.

Sometimes, the format in which open data is shared is a hindrance to smoothly including it in Wikimedia's ecosystem. PDF files, for example, are easy to read by humans, but might be hard to process automatically, requiring extra time to process and clean up the data. Occasionally, institutions with a low level of digital maturity are only able to share data in this format, which is both a challenge for Wikimedians and a great opportunity for them to make this previously unstructured information more accessible. In the project Offentligkonst.se, Wikimedia Sverige aimed to build a national database on public art, and requested public art data from Swedish municipalities. Many municipalities either

[24] Individual facts or data cannot be copyrighted. CC BY-SA reports can be used for references to individual facts but not systematically used to add information to Wikidata.
[25] Schuller, Nina Margaret. *The politics of memory: An extended case study of the memory of crisis on Wikipedia*. Diss. University of Southampton, 2023.
[26] McDowell, Zachary, and Matthew A. Vetter. "The Realienation of the Commons: Wikidata and the Ethics of "Free" Data." (2024).
[27] Pellissier Tanon, T., Vrandečić, D., Schaffert, S., Steiner, T., & Pintscher, L. (2016, April). From freebase to wikidata: The great migration. In *Proceedings of the 25th international conference on world wide web* (pp. 1419-1428).
[28] See e.g. McDowell & Vetter (2024) and Ford, H., & Iliadis, A. (2023). "Wikidata as Semantic Infrastructure: Knowledge Representation, Data Labor, and Truth in a More-Than-Technical Project". *Social Media+ Society*, 9(3).
[29] Piscopo, A., Kaffee, L. A., Phethean, C., & Simperl, E. (2017, October). Provenance information in a collaborative knowledge graph: an evaluation of Wikidata external references. In *International semantic web conference* (pp. 542-558). Cham: Springer International Publishing.
[30] Piscopo et al (2017).
[31] Azizifard et. al. (2022).

responded that they lacked data or had it in the form of a PDF document.[32] By adding this data to Wikidata, and using the external platform Offentligkonst.se to enrich it, it was improved with the help of volunteers. In similar ways, Wikimedia Uganda received a list of listed monuments from the National Museum of Uganda as a pdf. This pdf was digested and added to Wikidata, where volunteers have since added coordinates and imagery, for an enriched version of the original dataset.[33] Developing more automated processes for converting the contents of pdf files to structured data suitable for adding to Wikidata, e.g. such tools that are being developed for enriching ontologies through PDFs and Wikidata,[34] could reduce manual efforts and make data uploads more efficient and equal.

Several categories of data are needed for an efficient crowdsourced digital reproduction of heritage sites in danger, such as on the institutions, objects, or sites, in themselves as well as what they contain. This might be information about what species or ecosystems are protected or key to the heritage sites, or what buildings in the world heritage site are listed. For successful prioritization, it is also important to have data on what sites or contents are in danger and why. Many of these data types might require additional conceptualization and matching, and it is yet to be explored to what extent Wikidata or other Wikimedia platforms fit the kind of data. Biodiversity informatics have explored how fit Wikidata is for taxonomies and biodiversity, and some conclude that Wikidata might not be optimized for taxonomies, whereas it might be able to visualize the ‘big picture’.[35] Page, on the other hand, proposes that Wikidata is a good option for taxonomies and creating a “bibliography of life”.[36] WikiProject Tree Of Life seem to be aiming for something similar,[37] based on Encyclopedia of Life’s CC BY data (which is thus incompatible with Wikidata).[38] Others have highlighted the importance of Wikidata for linking identifiers, without considering the possibility of reflecting geographic distribution through Wikidata. Instead, GBIF is seen as the important database for geographic distribution,[39] even though some research has been able to visualize the large geographic and language gaps on Wikipedia and Wikidata in terms of taxa and biodiversity information.[40]

A next step would be to explore how Wikidata can be used not only to reflect taxonomic data but also to reflect the spatiotemporal distribution of the taxonomic data, to support Wikimedia volunteers in a better and more efficient crowdsourcing of information on these taxa. There are possibilities to reflect observations as Structured Data on Wikimedia

[32] See Editors, “Kontaktade kommuner”, *Wikimedia Sverige*, 10 July 2017, <https://se.wikimedia.org/w/index.php?title=Offentligkonst.se/Om_projektet/Kontaktade_kommuner&oldid=64563> and Editors, “Dataset”, *Wikimedia Sverige*, 10 July 2017. <https://se.wikimedia.org/w/index.php?title=Offentligkonst.se/Om_projektet/Dataset&oldid=64557>

[33] See “Wikidata monument list”, Wikimedia Commons, 25 October 2024, <https://commons.wikimedia.org/w/index.php?title=Commons:Wiki_Loves_Monuments_2023_in_Uganda/Wikidata_monument_list&oldid=949255863>

[34] Opasjumruskit, Kobkaew, Diana Peters, and Sirko Schindler. "Contron: Continuously trained ontology based on technical data sheets and wikidata." *arXiv preprint arXiv:1906.06752* (2019).

[35] Groom, Quentin & Paul, Deborah, “Does Biodiversity Informatics 💘 Wikidata?”, GBIF, 21 February 2020, <https://data-blog.gbif.org/post/wikidata/>

[36] Page RM (2022) Wikidata and the Bibliography of Life. PeerJ 10: e13712. <https://doi.org /10.7717/peerj.13712>

[37] Editors, “WikiProject Tree of Life”, English Wikipedia, 4 November 2024, <https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Tree_of_Life>

[38] See Copyright and Linking policy, *Encyclopedia of Life*, <https://eol.org/docs/what-is-eol/copyright-and-linking-policy>, retrieved 4 Nov 2024.

[39] Seah, Brandon. "Paying it forward: Crowdsourcing the harmonisation and linking of taxon names and biodiversity identifiers." *Biodiversity Data Journal* 11 (2023): e114076.

[40] Dnshitobu, M. K., Abah, A., Udeh, B., & Waagmeester, A. (2022). Using Crowd-sourcing Platforms to Increase and Spread Knowledge on the Biodiversity in Sub-Saharan Africa. *Biodiversity Information Science and Standards, 6*, e93803.

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Commons (SDC), but very few reproductions have this metadata. For instance, according to the query only one observation has been made of the red-listed European goshawk in the four countries of this project,[41] and there are many more observations of the Western European hedgehog in the categories on Wikimedia Commons than what SDC queries show.[42] There is a category on Wikimedia Commons for shapefiles for species distribution, but it almost only contains maps from a Portuguese dataset, reflecting distribution of species (such as European hedgehog) in Portugal.[43] Volunteers have also used IUCN data to create distribution maps as PNGs, such as on the European hedgehog, or in some cases SVGs (which is preferable).[44] There are 5 000 IUCN based animal distribution maps on Wikimedia Commons; in total, 296 flora distribution maps are rendered as SVGs.[45] Creating distribution maps based on IUCN data is time consuming and requires lots of efforts, whereas few databases release species distribution maps as shapefiles under Wikimedia-compatible licenses. Still, such maps would be of high value for exploring the intersection of species' observations and heritage sites. The Swedish portal *Artfakta*, run by SLU, the university of agricultural sciences, has species distribution maps (such as on the European hedgehog), but not under a Wikimedia compatible license.[46]

Geodata and geographic information enable tools to be built for locating heritage sites.[47] In 2020, Wikimedia Sverige made the first larger upload of so-called *shapefiles* to Wikimedia Commons, a file format where geographic information is stored as vectors. The upload was based on shapefiles made available by the Swedish Environmental Protection Agency.[48] The upload was of particular interest since Wikidata, otherwise typically the information for storing data, have few schemas for expressing spatio-temporal information.[49] Such projects can thus pave the way for other areas where geographic information is of importance on the Wikimedia platforms. Shapefiles enable collaborative mapping,[50] but also make it possible on the Wikimedia platforms to show the geographic extension of e.g. natural sites. Even though there is a lack of built-in Wikimedia tools for visualizing shapefiles, the upload made it possible to build an external tool for visualizing the geographic extension of natural sites in Sweden, as a new entry point for participation in Wiki Loves Earth.[51]

Open data on heritage sites and institutions can be used to lower thresholds for participation on the Wikimedia platforms, such as in the Wiki Loves campaigns. It can also be used to improve structured data and metadata about the reproduced objects, as well as

[41] Query from Wikimedia Commons, made 1 November 2024: https://w.wiki/Bm6f
[42] Query from Wikimedia Commons, made 1 November 2024: https://w.wiki/Bm6a
[43] See "Erinaceus europeaus", Wikimedia Commons, <https://commons.wikimedia.org/wiki/Data:Atlas_de_Mam%C3%ADferos_de_Portugal/Erinaceus_europaeus.map>, retrieved 4 November 2024.
[44] See "European hedgehog area 2", Wikimedia Commons, https://commons.wikimedia.org/wiki/File:European_Hedgehog_area2.png, retrieved 4 November 2024.
[45] See "Category: SVG Flora distribution maps", Wikimedia Commons, <https://commons.wikimedia.org/wiki/Category:SVG_flora_distribution_maps>, 4 november 2024.
[46] SLU Artdatabanken (2024). *Artfakta: igelkott (Erinaceus europaeus).* https://artfakta.se/taxa/100053 [2024-11-04]
[47] Posada, Emilio José Rodríguez, et al. "Wiki Loves Monuments 2011: the experience in Spain and reflections regarding the diffusion of cultural heritage." *Digithum* 14 (2012): 94-104.
[48] Naturvårdsverket (2017).
[49] Mandilaras, George E. "Spatial and Temporal information in the Semantic Web." (2019).
[50] Strevinas, Dimitrios. *Design and implementation of a spatially-enabled wiki.* Diss. TECHNICAL UNIVERSITY OF CRETE, 2009.
[51] Petrova, Anastasiia, "Digital tool that helps Wiki Loves Earth and the global community", *Wiki Loves Earth*, 15 May 2020, <https://wikilovesearth.org/digital-tool-that-helps-wiki-loves-earth-and-the-global-community/>

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increase opportunities for visualization. Successful crowdsourcing of cultural and natural heritage requires data on both the sites/institutions and the content they hold.

Engagement

In the absence of available datasets, many organizers of Wiki Loves Earth and Monuments campaigns have developed comprehensive Wikipedia lists with manually gathered information about heritage sites. Such lists, which typically work as the foundation for the campaigns, are highly valuable but time-consuming to compile and might be difficult for newcomers to overview or navigate. They also produce several obstacles to engagement, both in terms of working with the data and making use of the data to further engagement. One obstacle concerns language. A strength of using Wikidata for heritage management is its multilingualism.[52] From the outset, the aim has been to build a platform regardless of language, in contrast to Wikipedia, where versions are based on languages and not e.g. nations. The language-based approach of Wikipedia can be an obstacle in multilingual countries, or where certain languages are dominant. Even though a community attempts to create lists in different languages, the continual improvements can only be synced across them through manual efforts, often leading to contradictory information or the information in the non-dominant language being left unmaintained. Wikidata-rendered lists, instead, are automatically updated across languages as soon as the objects are updated.[53]

Another strength of Wikidata for engagement is that it highlights the power of a centralized and distributed approach, where, as Rossenova et. al. write, “a vast amount of information is accessible through a central endpoint in a standardized linked open data format, all items have PIDs (persistent identifiers), and all that information is crowdsourced through collaborative editing efforts.”[54] Humans and bots complement each other in adding, editing, and improving information, regardless of natural or programming language. In theory, it is not too large difference to engage with data on Wikidata and Wikipedia, but Wikidata makes it easier to work across languages and build interactive solutions to simplify engagement.[55] Often, digitized heritage items lack well-developed metadata, with short descriptions and a lack of rich contextual information.[56] This means that Wikimedia efforts to improve data and metadata can also be of importance to institutions and professionals.

Once every heritage site has a Wikidata item, the photographs taken in the campaign can be directly connected to them using Structured Data on Commons (SDC, structured information about media files) that both humans and machines can understand and process.[57] SDC can also be added manually by volunteers, and there are tools such as the ISA

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[52] See e.g. Rossenova, Lozana, Paul Duchesne, and Ina Blümel. "Wikidata and Wikibase as complementary research data management services for cultural heritage data." *Wikidata 2022: Wikidata Workshop 2022, Proceedings of the 3rd Wikidata Workshop 2022 co-located with the 21st International Semantic Web Conference* (ISWC2022). 2022; Kyriaki-Manessi, Daphne, and Styliani Vazaiou. "Using Wikidata for Managing Cultural Heritage Information." (2024).
[53] Ford, H., & Iliadis, A. (2023). “Wikidata as Semantic Infrastructure: Knowledge Representation, Data Labor, and Truth in a More-Than-Technical Project”. *Social Media+ Society*, 9(3).
[54] Rossenova et. al. Available under CC BY 4.0.
[55] See e.g. Qutab, Saima. *Emergence of a Crowdsourcing Ecosystem for Knowledge Curation and Creation in the Cultural and Heritage Sector*. Diss. ResearchSpace@ Auckland, 2023.
[56] Azizifard et. al. (2022).
[57] Qutab (2023).

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Tool through which inexperienced volunteers relatively easily can add such information in a gamified way.[58] With such information, Wikidata and Wikimedia Commons can be queried to extract metrics such as which heritage sites have been photographed the most, where they are located, which monuments lack photos, and what species are observed at a certain site. This data is helpful to organizers when arranging further campaigns and other projects, and for researchers, as e.g. quantitative research on multimedia content requires metadata.[59] SDC can also feed into aggregated repositories such as the Global Biodiversity Information Facility (GBIF).[60] From a Wikimedia perspective, SDC enables connecting several reproductions to the same heritage site, increasing the value of sharing more reproductions from more angles and avoiding the limitation of manual or Wikidata lists, where one image illustrate each object. Heritage professionals have noted the importance of taking multiple images of each heritage site, from different angles and over time, to reflect e.g. different aspects and seasons and the continual impact of time.[61]

Technology

Digitization

Kelly lists five ways in which media from GLAMs can be added to the Wikimedia platforms:[62]

1) GLAMs upload media from their digital repositories or collections,
2) GLAMs upload media directly to Wikimedia Commons (e.g. if they lack digital repositories)
3) Bots crawl digital repositories such as Flickr and Internet Archive for free media and upload it to Wikimedia Commons
4) Users upload media from GLAMs' digital collections or repositories with free media
5) Users make their own digital reproductions of GLAMs' material.

All these steps require data on institutions/sites and their content: What institutions exist, where are they situated, are they accessible, and what content do they hold? What are their levels of protection and why are they protected in the first place? The first step may require collaboration with national, regional, or international media database aggregators such as Europeana or Digitaltmuseum in Sweden. The second step requires, if not aggregated on a cross-institution level, collaboration with many of these institutions themselves. The first two steps require tools for batch uploads, such as OpenRefine,[63] as well as APIs to enable machines to down/upload content. The two last steps require user-friendly interfaces for volunteers with varying levels of IT skills.[64] Research indicates that Wikimedia Commons is unknown by the public and under-researched by scholars and that this may partly be caused by an unwelcoming interface. Attempts to gamify and thereby lower barriers to contributing have been proposed as a way to broaden both awareness and participation.[65]

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[58] Ib.
[59] Azizifard et. al. (2022).
[60] Page (2022).
[61] Gustafsson (2021).
[62] Kelly (2019).
[63] Rossenova et. al. (2024).
[64] Alves, É. P., Burley, P. R., de LIMA, S. F., Peel, M. W., & Peschanski, J. A. (2022). The Technical Infrastructure of Cultural Initiatives on Wikimedia: Three Case Studies From Brazil. *ESSACHESS–Journal for Communication Studies*, *15*(1 (29)), 127-151.
[65] Menking, A., Rangarajan, V., & Gilbert, M. (2018). "Sharing small pieces of the world" Increasing and broadening participation in Wikimedia Commons. In *Proceedings of the 14th International Symposium on Open Collaboration* (pp. 1-12).

This project is funded by the Swedish Institute.

One central question is to what extent Wikimedia technology favors crowdsourcing, and what barriers exist. An unwelcoming interface is proposed as one barrier, and management research indicates that the amount of clicks is one variable that impacts crowdsourcing and that few clicks amount to lower barriers.[66] For WLM in Ukraine, roughly four clicks are needed to reach the upload page, and for WLE in Sweden, three or four clicks, that in addition take participants between Wikipedia and Wikimedia Commons without much explanation. The WLE map developed by Wikimedia Sverige[67] provides some gamification to lower barriers but still give little guidance. Wikimedia volunteers also need to be encouraged to take additional photos of the same objects and sites over and over again to reflect different seasons as well as the passing of time,[68] which the current interface does not necessarily encourage. It simply states whether an object is documented or not.

Complete digital documentation of heritage sites and their content also requires capturing various aspects of the sites. Conservationists have in-depth knowledge of what aspects of a building or a nature reserve need to be reproduced. They also know how to choose file format depending on usage and purpose. Unnerbäck et. al. note that cultural heritage sites are *completely* documented when it ensures that the monument can be reconstructed should it ever get destroyed. This is a very high bar, but they also note that not all built monuments require complete documentation.[69] This indicates the importance of data answering such questions as which monuments need to be completely documented, and which monuments only need to be sufficiently documented. A starting point for this, according to Unnerbäck, is that complete documentation should be the goal for objects with very high cultural and historical value, or with significant value and high risk of damage or threats.[70]

Based on the desk review, fewer studies seem to have explored digitization of natural heritage in danger. Studies have stated the possibility that "digital tools designed to capture, interpret and share data about biodiversity and planetary systems" may "provide opportunities to tackle some of the key environmental challenges of our time". Digitization of nature is thus seen as something that could support work against climate change.[71] In *Gaia's Web*, Karen Bakker highlights that such technologies can support issues related to oceans, fishing, biodiversity, wildlife, and climate change. Through digital means, marine protected areas and other habitats difficult to reach can more easily be approached, though, at the same time, the same risk opening them up to poaching and other illegal activities.[72]

Academic theory on photography highlights how reproductions in the form of photos also "reverberates the photographer's inner sense",[73] and that it is hard, if not impossible, to take

[66] See e.g. Kamstrup, Andreas, and Emil Husted. "Crowdsourcing and Digital Platforms." *Anarchism, Organization and Management*. Routledge, 2020. 169-183; Kohler, Thomas. "How to scale crowdsourcing platforms." *California Management Review* 60.2 (2018): 98-121.
[67] Wikimedia Sverige, "Wiki Loves Earth 2021", Interactive map: <https://map.wikilovesearth.se/#59.48415,15.07324,7z>
[68] Gustafsson (2021)
[69] Unnerbäck, A., & Lierud, P. (2002). Kulturhistorisk värdering av bebyggelse. Retrieved from https://urn.kb.se/resolve?urn=urn:nbn:se:raa:diva-3644
[70] Unnerbäck & Lierud (2002).
[71] Jennifer Garard, H. Damon Matthews (2024). Digitizing nature. *Science* **384**, 39. DOI:10.1126/science.ado4359
[72] Bakker (2024).
[73] Azizifard et. al. (2022).

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an 'objective' or 'neutral' photo. Johan Jönsson argues in slightly similar lines in *Wikipedia inifrån,* criticizing overly aesthetic reproductions in e.g. Wikipedia's annual Picture of the Year competition, and the same criticism could likely be raised against Wiki Loves campaigns: Do they represent the real object?[74] Compiling checklists and guidelines on professional heritage reproduction could at least increase the likelihood that reproductions are in line with professional heritage requirements and not only aesthetic principles.

Currently, most heritage information on the Wikimedia platforms takes the form of Wikipedia articles, photos, and videos on Wikimedia Commons, and data on Wikidata. 2D reproductions might however only reflect parts of the heritage sites, lacking a sufficient amount of angles and crucial details. Heritage digitization will however require new and additional technologies,[75] and to follow suit, Wikimedia needs to develop tools and processes for contributing to digitization in a larger variety of ways. This might entail developing opportunities for 3D digitization and other ways of reproducing a more comprehensive picture of heritage sites through the Wikimedia platforms and for further reuse. As Backup Ukraine shows,[76] modern smartphones are good enough for 3D digitization of cultural heritage.[77] Necessary development of Wikimedia Commons has however not taken place to allow for visualizing such reproductions on the platforms.

To respond to the question on what to digitize and how, as well as in what order, i.e. what to prioritize, data and tools are needed. Data in this context might mean structured data on protected cultural and natural sites in a country, data on content in a cultural heritage institution's collections or species in a protected natural site, coordinates and shapefiles to lower barriers for volunteers to find the heritage and other kinds of data that enable volunteer engagement. Tools might mean innovative ways of structuring data and content to make digitization efforts easier, new or better interfaces for getting involved with the Wikimedia platforms, or gamification efforts to support increased volunteer engagement.

Engagement and enrichment

After multimedia content has been digitized and made available on the Wikimedia platforms, the following question is how to enable volunteer engagement with the content and enrichment of the information (e.g. metadata) about it. Engaging with content e.g. through illustrating Wikipedia articles is important for various reasons, including for contributing to education and learning objectives.[78] In 2020, half of all Wikipedia pages lacked images, and 95% of Wikidata items.[79] Adding photos to Wikidata will make them appear in the language versions of Wikipedia that retrieve infoboxes from Wikidata.[80]

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[74] Jönsson, J. (2022). *Wikipedia inifrån*. [Stockholm]: Verbal.
[75] Manning, L. (2022). Reproduced Reality: Cultural Artifacts and the Value of Original in the Age of Photogrammetric Reproduction. *Uppsala University*. https://www.diva-portal.org/smash/record.jsf?dswid=-7274&pid=diva2%3A1632441
[76] Backup Ukraine, "Preserve your heritage. Forever", *Polycam*, <https://poly.cam/ukraine>
[77] Cieslik, Emma. "3D digitization in cultural heritage institutions guidebook." *Univeristy of Maryland: Baltimore, MD, USA* (2020)
[78] Silva, A., Tracy, M., Reinecke, K., Adar, E., & Redi, M. (2024). Imagine a dragon made of seaweed: How images enhance learning in Wikipedia. *arXiv preprint arXiv:2403.07613*.
[79] Redi, M., Gerlach, M., Johnson, I., Morgan, J., & Zia, L. (2020). A taxonomy of knowledge gaps for wikimedia projects (second draft). *arXiv preprint arXiv:2008.12314*.
[80] Sáez, T., & Hogan, A. (2018, April). Automatically generating Wikipedia info-boxes from Wikidata. In *Companion Proceedings of the The Web Conference 2018* (pp. 1823-1830).

Campaigns like Wikipedia Pages Wanting Photos and Visible Wiki Women also contribute to the illustration of Wikipedia articles, as well as tools such as WDFIST and Wikishootme.[81] Wiki Loves campaigns might partly contribute to this, from a heritage point of view, if SDC is added to the photos to make them easier to find. The sheer size of Wikimedia Commons and the millions of reproductions that campaigns such as WLM and WLE have resulted in show the importance of continuing to develop similar tools and initiatives. It is also important to support the enrichment of digitized content, e.g. through improving the SDC, proper metadata, and categorization. SDC could in theory contribute to lower barriers for contributing to the enrichment of data,[82] and tools such as ISA Tool contribute to gamification of improving the SDC.[83] Map visualization tools also often show mistakes in geodata that are difficult to see in text form. Many of these tools are however in beta form, developed by volunteers, or lack long-term sustainability in other ways.

Prioritization

Data and tools are needed to identify what should be digitally reproduced and in what order. Lists for the Wiki Loves campaigns are typically prioritized based on what local, regional, or national governments have decided to list or protect, and how easy it is to access the site.[84] There is an obvious risk that governments have passively or actively foreseen sites that are of importance for marginalized groups, far from institutions, or whose value is not realized.[85] Some research also indicates that the lack of recognition of such heritage makes marginalized or vulnerable groups especially affected by disasters.[86]

Cultural heritage professionals have compiled research and best practices on what to prioritize in the event of a crisis. One simple model proposes that heritage that has high value and high risk should also have high priority.[87] The Swedish Maritime Museum prioritizes heritage items according to whether it is of exceptional importance, large importance, or importance to the collections. Value is in turn based on:[88]

1. Cultural-historical value (i.e. if it has good provenance and provides important perspectives within the field of the museum)
2. If it is unique
3. Its physical condition
4. Its status in the collection (is it on loan? Or owned by the museum?)
5. Ethical aspects (does it contain human remains etc.)

This is however developed for museum collections and not necessarily heritage sites that would be of relevance for e.g. WLM and WLE. It has been hard to identify, within the

81 Silva et. al. (2024).
82 Redi et al (2024).
83 Qutab (2023), p. 32.
84 Azizifard et. al. (2022).
85 See e.g. Silverman, H. (2010). Contested cultural heritage: A selective historiography. In *Contested cultural heritage: Religion, nationalism, erasure, and exclusion in a global world* (pp. 1-49). New York, NY: Springer New York.
86 Gibson, J., Hendricks, M. D., & Wells, J. C. (2019). From engagement to empowerment: How heritage professionals can incorporate participatory methods in disaster recovery to better serve socially vulnerable groups. *International Journal of Heritage Studies*, *25*(6), 596-610.
87 See e.g. Carlsten, S. (2023). *Prioriteringar i föremålssamlingar: beredskap inför krig och katastrof.* Visby: Riksantikvarieämbetet.
88 Carlsten, S. (2023).

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timeframe of the project, attempts to develop criteria for the prioritization of digital reproductions of protected nature and natural sites in danger.

Visualization and reuse

Little has been done by Wikimedians to make heritage information accessible in other ways than through structured data on Wikidata or Wikipedia articles. In the context of protected natural areas, Wikimedia Sverige pioneered the Wikimedia usage of shapefiles on natural sites in the first larger upload of these to Wikimedia Commons, which made it possible to develop a virtual map of natural heritage sites across the country.[89] At this point, shape files of natural sites only exist from Sweden and Czechia on Wikimedia Commons, and only Sweden has complete data.[90] Some biodiversity informatics have looked towards Scholia and similar Toolforge-based tools, arguing that such tools could be developed for visualization of biodiversity and taxonomy data.[91] Mature data might also increase interest in using infoboxes with data retrieved from Wikidata in Wikipedia articles,[92] as was the case with coastal water data on Swedish Wikipedia.[93] High-quality data on protected nature and culture will also increase the value of Wikidata in research.[94] SDC and data in Wikidata are machine-readable and render themselves to external re-use. Such data can be displayed and analyzed in websites and mobile applications, enabling developers to create innovative ways to present it to the public, further increasing its reach and engaging non-Wikimedians. It also makes the information easier to use by other actors such as researchers.

Method

This paper has been developed based on extensive desk research, combined with three digital meetings held with the working group. The working group has especially worked with compiling checklists of what to document at cultural and natural sites, a question that underlies much of the reasoning in this paper.

Conclusion

The digital preservation of cultural and natural heritage, driven by initiatives such as Wiki Loves Monuments (WLM) and Wiki Loves Earth (WLE), highlights the increasing importance of open access and crowdsourcing in documenting and safeguarding heritage. These projects have successfully mobilized volunteers worldwide, resulting in extensive repositories of crowdsourced media content valuable for preservation, education, and research. Volunteer efforts have shown that enrichment activities, such as adding coordinates, can significantly enhance the quality and accessibility of metadata.

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[89] A. Petrova (2020). Digital tool that helps Wiki Loves Earth and the Global Community. *Wiki Loves Earth.* https://wikilovesearth.org/digital-tool-that-helps-wiki-loves-earth-and-the-global-community/
[90] Commons users. “Map data of protected areas”. Wikimedia Commons. https://commons.wikimedia.org/wiki/Category:Map_data_of_protected_areas
[91] Page (2022).
[92] Sáez & Hogan (2018).
[93] Algotsson, Josefina, F Van Der Stelt, and D Abdoush. "Swedish coastal water bodies on Wikidata Combining WFD data with Wikidata." (2019).
[94] See e.g. Groom, Quentin & Paul, Deborah (2020).

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The review however reveals significant geographic and thematic gaps in existing datasets, resulting from e.g. technical barriers and unclear IP rights. The platforms also need further refinement or external tools to enhance user experiences and lower barriers to participation. Wikidata is still perceived as being hard to work with. Gamification, automated data integration processes, and improved user interfaces are critical to increasing volunteer involvement and improving metadata and contextual information. While significant progress has been made with cultural heritage—such as matching and uploading datasets and forming partnerships with GLAM (Galleries, Libraries, Archives, and Museums) institutions—digitization efforts for natural heritage remain underexplored. Some stakeholders consulted for this review still struggle to understand the importance of digital representations of natural heritage.

A notable gap in the Wikimedia movement is the lack of risk analyses that typically guide heritage institutions' digitization projects. Addressing this will require gathering data about heritage sites, their contents, and intersections between the two. Conceptual work is needed to determine which data are necessary for prioritization, their availability, and how to integrate them into Wikidata. Different strategies may be required for cultural versus natural heritage, as well as tailored approaches for different countries based on available data from authorities. Manual prioritization is impractical for large datasets; for instance, a joint project by Wikimedia Sverige and Ukraine added 95,000 Ukrainian cultural heritage objects to Wikidata. For such volumes, automated prioritization is essential as an initial step, informed by existing models and adapted for broader community-driven projects.

Additional conceptual development is also needed for adding, structuring, and visualizing heritage data, particularly in documenting the geographic distribution of species within protected natural sites. Current contributions to initiatives like Wiki Loves Earth often do not capture what specifically qualifies these areas as protected, due to a lack of data on prominent or endangered species and biosystems. Understanding what these sites contain is crucial for comprehensive documentation, guiding volunteer efforts, and ensuring that valuable aspects are reproduced. The draft checklists is a starting point for this, though practical implementation will require further conceptual work and data visualization. These checklists could be supplemented by training programs or learning modules. In similar ways, Wikimedia should develop tools for visualizing heritage data, e.g. in the form of Scholia-inspired tools to illustrate taxonomy and biodiversity, which has been proposed by scholars.

Wikidata should be the central Wikimedia repository for data (unless in the exceptional cases when Wikimedia Commons is better fit, like with shapefiles). Directly adding datasets to Wikidata enhances provenance and improves referencing. This involves identifying and linking openly licensed datasets on cultural and natural heritage, especially within the four project countries (Ukraine, Georgia, Poland, and Sweden), and advocating for CC0 licensing for geodata and CC BY-SA or less restrictive for shapefiles. Structured data integration from databases is also more efficient than manual list updates on Wikipedia. Enhanced data on

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Wikidata can stimulate interest among Wikipedia communities to display Wikidata content through infoboxes and automated lists, increasing both data visibility and reducing manual workload for editors, and make any potential visualization tools as proposed above better. For Wiki Loves campaigns, accurate geodata, including coordinates and shapefiles, is crucial. Such data would support the development of advanced visualization tools, making participation more accessible to volunteers. Existing maps, like those created by Wikimedia Sverige, only show whether a site has been photographed. More comprehensive mapping layers are necessary to encourage volunteers to document the same sites under varying conditions and from multiple perspectives, reinforcing the need for detailed checklists. SDC can facilitate repeated documentation and easier linking of reproductions to Wikidata and Wikipedia. Emerging technologies, such as 3D digitization, offer promising avenues for more comprehensive documentation but also require further development within Wikimedia infrastructure to support and visualize such formats effectively.

In conclusion, advancing the digital preservation of heritage on Wikimedia platforms will hinge on a coordinated approach that combines community engagement, data integration, technological advancements, and strategic prioritization. Overcoming these challenges will enhance the quality, accessibility, and reuse potential of digital heritage data, establishing it as an essential resource for education, research, and global heritage conservation.

Reflections

This paper lays a groundwork by establishing key principles and insights, but due to time constraints, many questions remain unanswered. We have only begun to explore what is necessary for more professional heritage conservation through Wikimedia platforms. Once these measures are implemented, an important question arises: how should the Wikimedia movement prioritize given the limited availability of volunteer time? Should the focus be on writing articles, taking photos, or improving data? Are these activities equally significant, or should one be prioritized over the others? Additionally, how can partnerships with institutions and automated processes support volunteers without overshadowing tasks they prefer to do themselves? Ultimately, with the range of work required within the Wikimedia movement, understanding where volunteer efforts are most impactful – and stimulating for the volunteers – is essential.

Another significant area, briefly mentioned but requiring case studies, further research, and collaborative exchange, is the use of Wikidata for prioritizing efforts. What types of data can be gathered, and how can this data be translated into prioritization criteria? How can such criteria be effectively matched with Wikidata, and how can the data be leveraged to enable meaningful prioritization? Addressing these questions would professionalize and enhance the efficiency of Wikimedia's crowdsourced efforts to safeguard heritage at risk. Still, it requires both identifying relevant datasets, conceptualizing how to use them and work actively with heritage institutions to explore efficient ways of using this data in a meaningful way. The big size of datasets on heritage sites in many European countries, including

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Sweden, Georgia, Poland and Ukraine, means that prioritization, at least in the first step, need to be quantitative rather than qualitative. Experiences can likely be drawn from work by heritage institutions, informed by existing models but adapted for broader community-driven projects.

Prepared by: Wikimedia Sverige (lead by Eric Luth), with the support of the working group on technology and content

Annex

Checklist for digital documentation of protected culture

Data needed

- [ ] Size
- [ ] Time for establishment
- [ ] Purpose of protection
- [ ] Items within the site
- [ ] Accessibility and geodata
- [ ] Coordinates (shapefile if covering a larger area)
- [ ] Data for risk management

Formats

- TIFF best, JPG works
- Preferably not wide-angle lens as it can distort the perspective. If you want to take a photo with wide angle, then preferably also take another photo without wide angle lens.

Output

- According to the 1996 ICOMS Declaration in Sofia, the output of digital documentation can be in the form of written descriptions and analyses, photos (aerial and terrestrial), rectified photography, photogrammetry, geophysical surveys, maps, measured plans, drawings, and sketches, replicas or other traditional or modern technologies.
- Documentation should include:
- [ ] Name of the heritage site
- [ ] Unique reference number
- [ ] Date of the documentation
- [ ] Author (of reproduction)
- [ ] Cross-references to any related documentation
- [ ] Location (by description, map, plans, aerial photographs, geodata)

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Images needed

How well a site need to be documentated should be determined by the object's value, its resistance to wear and tear, and whether it is under any threat, risk, or change. This decision depends on a combination of the level of protection and the level of threat or risk the object faces.

For example, a wooden building typically requires more comprehensive documentation than a stone building, as the risk of complete destruction by fire is higher for wooden structures.

Complete documentation

An object is completely documented when it is fully reproduced, capturing all its traits and attributes, construction details, materials, and other qualities. Such comprehensive documentation provides the necessary foundation for the conservation and care of the object and serves as a long-term source of knowledge and information. Proper documentation allows anyone, even those unable to visit the object, to understand its physical characteristics and the atmosphere it conveys. From a technical perspective, complete documentation ensures that the object can be reconstructed if it is ever destroyed.

Achieving complete documentation should be the goal for objects with very high cultural and historical value or for those with significant value and at risk of damage or threats (such as wooden houses or roof structures), and can focus on the entire object or parts of it.

Standard documentation

Normal documentation of an object should provide an objective and detailed representation of the building, along with a clear sense of its more abstract qualities, such as patina, identity, uniqueness, and educational value. This documentation lays the foundation for making informed decisions regarding management and care and can be expanded for use in research or further management activities.

Standard documentation should cover the following:

- **Exterior Photographs**: Document all facades and important details, ensuring that the roof and socles are clearly visible, showing the type, form and dimension of the site, as well as materials, parts, constructions, decorations, ornaments, inscriptions etc.
- **Surrounding Area Photographs**: Capture the relationship between the building and its surroundings, showing their interplay and how the building appears both up close and from a distance, as well as any ancillary structures (gardens, landscape, machinery, cultural/topographical/natural features of the site)
- **Interior Photographs**: Include detailed images of woodwork, fireplaces, floors, cornices, roof structures, and other significant features. Preferably, also document staircases, large rooms and halls, attics, and additional rooms to provide a representative view of the building's preservation status.

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- **Measured drawings** of at least one level of the building.
- **Section drawings** showing roof construction, roof slopes/pitches, foundations, floor height etc.

Checklist:

Exterior details of the building

- ☐ Facades
- ☐ Windows (examples)
- ☐ Doors (examples)
- ☐ Roof and ceiling (to the extent possible)
- ☐ Socles
- ☐ Walls (including boundary walls, techniques, and materials used)
- ☐ Basement or cellar (if present)
- ☐ Representative elements or samples of construction or site materials

Surrounding area

- ☐ Images of the environment and surroundings (from the street, sides, and courtyard)
- ☐ Aerial photos to provide an overview of the protected cultural heritage object

Interior details

- ☐ Interiors showing typical style elements
- ☐ Ceilings
- ☐ Floors
- ☐ Woodwork
- ☐ Fireplaces
- ☐ Cornices
- ☐ Roof structures
- ☐ Walls
- ☐ Heating systems
- ☐ Stairs and staircases
- ☐ Large rooms, halls, attics
- ☐ Inner doors

Checklist for digital documentation of protected nature (draft)

Data needed

- ☐ Ecosystem
- ☐ Habitat types
- ☐ Typical species

- [ ] Characteristic species
- [ ] Keystone species
- [ ] Rare species
- [ ] Size of protected site
- [ ] Time for establishment
- [ ] Responsible agency (municipality, regional government, state)
- [ ] Purpose of protection
- [ ] Coordinates
- [ ] Shapefile, if it covers an extended area
- [ ] Accessibility geodata
- [ ] Risk assessment data

Images needed

- [ ] Images of the same motives from different seasons
- [ ] Images of typical, characteristic, keystone, rare species
- [ ] Images from a viewpoint to capture different habitat types
- [ ] Images and videos of phenomena: a flowing stream, fog over a forest, the floor of a deciduous forest in bloom, swarming mayflies, lek mating fish, breeding birds...
- [ ] Aerial photos to provide an overview of the protected area

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Legal

Wikimedia projects (Wikipedia, etc.) rely on a free license policy to support open knowledge sharing, which is foundational to the Wikimedia movement's mission. Wikimedia's free license policy mandates that content must be available under licenses, allowing anyone to access, use, modify, and share it freely. This policy helps ensure accessibility, transparency, and collaboration across all Wikimedia projects. This allows information created on Wikimedia projects to be accessed globally without restrictions, promoting knowledge equity. Also, free licensing attracts educational and cultural institutions, which often align with Wikimedia's goals and contribute to free culture by sharing their collections on platforms like Commons.

Currently, Wikimedia projects and other open-licensed platforms face issues with licensed materials from GLAM and government organizations centered on restrictive licensing practices, control over digital content, and challenges with open-access compliance.

Many GLAM and government institutions release digital collections and data under licenses restricting reuse, modification, or distribution. While these institutions often intend to make their content accessible, they frequently apply licenses that limit how materials can be used, modified, or shared. This approach conflicts with Wikimedia's mission of free licensing, which requires content to be openly available for anyone to access, share, and build upon without significant restrictions.

Also, there is an issue with data ownership and control. Many organizations and government agencies prefer to maintain specific usage conditions over digital representations of their collections, often requiring detailed attribution or reserving some rights to control how materials are presented. This cautious approach can discourage partnerships with platforms like Wikimedia Commons, where contributions must be released under licenses that allow more unrestricted use.

The absence of Freedom of Panorama (FoP) in some countries restricts Wikimedia's ability to host images of public buildings, sculptures, and artworks, as these are often still under copyright. This limitation creates significant issues, which causes content gaps and a cultural imbalance in Wikimedia projects, as certain regions lack visual representation. As a result, it discourages contributors from sharing images from these regions, reducing the diversity of Wikimedia's visual content and limiting public access to knowledge about culturally significant landmarks.

Freedom of Panorama and open copyright policies are vital for preserving and sharing cultural heritage. This enables people to take images of public monuments and artworks without restrictions, supporting platforms like Wikimedia in creating accessible archives of cultural landmarks. Open copyright aids in preserving heritage at risk of loss, allowing digital records of at-risk monuments and artifacts to be safeguarded online.

This is especially relevant in regions like Eastern Europe and countries such as Georgia and Ukraine, which face ongoing conflicts or occupation by foreign powers, putting their cultural and natural heritage at high risk of destruction. In these areas, monuments, historic buildings, artworks, and natural landmarks are vulnerable to damage, vandalism, or complete loss. Freedom of Panorama and open copyright policies become critical here, as they allow for documentation, the creation of databases, and the sharing of heritage assets. By enabling public access to photographs and records of such sites, these policies help create a digital legacy that can preserve cultural identity and history, even if the physical structures are lost.

These issues highlight the need for ongoing dialogue to find mutually beneficial solutions. By addressing these challenges, all types of institutions and Wikimedia can work toward making more cultural and government resources freely accessible to a global audience, promoting both institutional goals and the broader mission of free knowledge.

In the following paragraphs, by studying official documents and legislation of specific countries, we have prepared the position of Freedom of Panorama and Copyright of public documents and data in Sweden, Georgia, Poland, and Ukraine. This will allow us to understand the different approaches to these issues in different countries and to develop recommendations for further work to achieve our goals of protecting cultural and natural heritage.

Freedom of Panorama

Freedom of panorama is the legal right to publish pictures of artworks, sculptures, paintings, buildings, or monuments that are in public spaces, even when they are still under copyright. This right allows creating and using images of works that are permanently located in public places without the author's consent.

There is no standard approach to freedom of panorama, a copyright exception, among the European Union (EU) member states. Different states have very different forms of freedom of panorama, including the types of works covered and the ways in which images of such works may be used. This causes complexity for users since for the legitimate use of the photos of works, it is necessary to study the laws of each state separately.

At the European Union (EU) level, freedom of panorama is enshrined in Directive 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society ('InfoSoc Directive'). Article 5(3)h establishes that EU member states may provide for exceptions or limitations to the exclusive reproduction right of works, such as works of architecture or sculpture, located permanently in public places. This exception is discretionary and leaves the possibility for member states to decide independently on the inclusion of such a provision in national law, as well as how to implement it. Freedom of

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panorama is formulated in the InfoSoc Directive in a general form, leaving a broad margin of discretion for member states to determine the boundaries of their legislation. This has led to the development of several different approaches to the regulation of freedom of panorama. An overview of these approaches is presented below.

General Approaches

Use of Images Allowed for Any Purpose without Remuneration

Some European countries permit the use of images of works for commercial purposes without obtaining a permit and without remuneration of the original artist.

In some states, such as Croatia and the Czech Republic, the name of the author needs to be indicated unless the work is anonymous or unless such indication is not possible. However, permission to use the work is not required.

Use of Images for Any Purpose with Remuneration

The practice of allowing the use of images of works for any purpose as long as the original artist is remunerated is not widespread among EU member states, but nonetheless, it exists, as for example, in Austria, where authors are entitled to remuneration for some kinds of reproduction (notably making a physical copy of an artwork and making it available to the public) (Article 54,5 if copyright law).

This approach is typical of copyright exceptions since it does not require permission to use the work. At the same time, the author retains the right to fair remuneration, which ensures respect for the author's interests, especially when the image of the work is used for commercial purposes.

Use of a Panoramic Image for Any Purpose; Use of an Image of a Particular Work for Non-commercial Purposes Only

In a number of EU member states, freedom of panorama depends on what is contained in the image. If an image does not focus on a specific work in a public space, the image can be freely used for any purpose. On the other hand, when the main element in the image is a particular work, the use of this image is restricted.

In Estonia, it is permissible 'to reproduce works of architecture, works of visual art, works of applied art or photographic works which are permanently located in places open to the public, without the authorization of the author and without payment of remuneration, by any means except for mechanical contact copying, and to communicate such reproductions of works to the public except if the work is the main subject of the reproduction and it is intended to be used for direct commercial purposes.'

Use of Images for Non-commercial Purposes Only

The use of images for commercial purposes is considered to be beyond the scope of freedom of panorama and requires permission from the author.

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In Latvia, freedom of panorama covers 'the use of images of works of architecture, photography, visual arts, design, as well as of applied arts, permanently displayed in public places, for personal use and as information in news broadcasts or reports of current events, or include in works for non-commercial purposes.

No freedom of panorama

Two EU member states, Greece and Italy, currently do not have freedom of panorama. The copyright law of Greece permits only the occasional reproduction and communication of images of works located permanently in public places by the mass media.

The situation in some countries

Sweden

Under Swedish Copyright law (Section 24.1 of the Copyright Act), works of fine art that are permanently situated outdoors in a public place or exhibited are allowed to be depicted. Para 2 of the same section allows buildings to be 'freely depicted'.

Currently, this exception applies even when the works are used commercially, for example, on postcards. Thus, it is an exception to the normal rule that the copyright owner has the exclusive right to authorize the creation and distribution of derivative works.

In 2016, the Supreme Court of Sweden ruled in a case that set a precedent, Wikimedia v. BUS (the Visual Art Society of Sweden). The case concerned a database with data on public art that Wikimedia Sverige operated. The database, which was visualized on Offentligkonst.se, also linked to depictions of public art on Wikimedia Commons. In this way, the depictions of the works of public art were made publicly available.

BUS filed a lawsuit against Wikimedia Sverige alleging that the depictions of three sculptures made available to the public on the website constituted copyright infringement. Wikimedia Sverige claimed that the freedom of panorama applied since the provision allows both making reproductions of the works and communicating them to the public. BUS claimed however that this applies only to printed materials, not online.

Stockholm District Court decided to refer two questions to the Supreme Court, namely whether the word "depict" pursuant to section 24 first paragraph point 1 was to be understood as allowing works of fine art permanently placed outside at a public place to be communicated to the public via the Internet, without permission or remuneration to the copyright owner, <u>and</u> whether it made any difference if such communication had a commercial purpose or not.

In its decision, the Supreme Court clarified that the provision in the Swedish Copyright Act must be interpreted in light of the Infosoc Directive. Bearing that in mind, it interpreted the provision in accordance with the three-step test set out in the Infosoc directive, namely that (1) restrictions of copyright may only be applied in certain specific cases (2) which do not conflict with a normal exploitation of the work (3) do not unreasonably prejudice the legitimate interests of the right holder.

As for the principles laid down in the three-step test, the Supreme Court first clarified that as a starting point the relevant provision should be subject to a restrictive interpretation, it

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being an exception. Secondly, on the question of what constitutes normal use of a work of art placed in a public place and what exclusive right the author should have to exploit his work economically, the court concluded that use in an open database is typically not of insignificant commercial value, neither for the person operating the database nor the person that accesses the database. Therefore, such value should be reserved for the author, regardless of whether the database operator has a commercial purpose. As for the last criterion, whether the communication to the public that took place from Wikimedia's database unreasonably prejudiced the authors' legitimate interest, the Supreme Court argued that although the purpose of the database is in the public interest— bearing in mind that exceptions should be interpreted restrictively—the restriction of the author's rights is considerably more significant than the purpose of the provision. Thus, in their decision, the right to exploit works of art through new technology by a public database on the Internet should remain with the authors, pursuant to the present wording of the Copyright Act.

The debate in Sweden has been intense, and following the Wikimedia ruling, the Swedish Government commissioned a public inquiry to review several of the exceptions and limitations in the Copyright law. The inquiry report SOU 2024:4[95] was handed over to the Government in January 2024, and contains a proposed revised provision for a modernized freedom of panorama exception that allows for making available to the public online, albeit with some restrictions on commercial use. It remains to be seen whether the possible legal change is seen as compatible with Wikimedia platforms and CC BY-SA.

Georgia

According to Article 24 of the Law of Georgia "On Copyright and Related Rights," it is allowed to reproduce or publicly transmit works of architecture, photography, or fine art permanently located in places open to free attendance without the consent of the author or other owner of copyright and without payment of royalties, except for those cases, when the image of the work is the main object of such reproduction or public transmission or is used for profit.

As a result, Georgian legislation prohibits the FoP. The results of applying the mentioned article in practice are not known.

Ukraine

A new Ukrainian Law on Copyright and Related Rights was adopted in December to enter into force on 1 January 2023. Under mentioned law, without the permission of the copyright holders and free of charge, but with the indication of the author's name and the source of borrowing, it is allowed:

> *10) creation of images of works of architecture and fine art, which are permanently located in places accessible to the public, and further use of such objects, provided that such actions do not have independent economic significance;*

[95] https://www.regeringen.se/rattsliga-dokument/statens-offentliga-utredningar/2024/01/sou-20244/

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The updated list of general exceptions and limitations provided in Article 22 (10), for which the concept of 'general cases of free use' is used, includes the Ukrainian version of 'freedom of panorama.' Thus, it is allowed to create images of works of architecture and fine art that are permanently located in places accessible to the public on the street, free of charge and without permission, provided that such actions do not have independent economic value. This provision somewhat truncates the granted freedom, as it does not directly permit the following use of such images.

Poland

Under Polish law, FoP is addressed in Art. 33(1) of the Act on Copyright and Related Rights as one type of permissible use. According to the act, "it is permissible to disseminate works permanently displayed in generally accessible roads, streets, squares or gardens, but not for the same use." From the point of view of software developers, what is most important here is the lack of restrictions on the commercial use of images of Polish architectural structures and obtaining benefits from their dissemination. But how can the freedom of panorama be legally exploited, and where are its limits? What cannot be included in a game or app? There are some questions about this topic. But still, in Poland, there is quite a high level of freedom of panorama.

Copyright of public documents

Governmental databases can be subject to varying degrees of copyright protection depending on the jurisdiction and the specific type of data.

In the **United States**, works created by federal government employees as part of their official duties are generally in the public domain (17 U.S.C. § 105). This means that federal government databases are usually not subject to copyright and can be freely used by the public.

The **European Union's** Public Sector Information (PSI) Directive encourages member states to make public sector data widely available for reuse. However, the directive does not mandate that such data be free of copyright. Each member state has its own implementation, which can affect the availability and copyright status of governmental databases.

The **Swedish Copyright Act** (Upphovsrättslagen)[96] provides that official documents produced by public authorities are generally not protected by copyright. This means that a lot of government data can be freely used by the public (in the cases that the data is a decision or a statement by an authority).

> *Section 9 Copyright does not apply to*
> 1. *constitutions,*
> 2. *decisions by authorities,*
> 3. *statements by Swedish authorities and*
> 4. *official translations of things referred to in 1-3.*

[96] Available at: https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/lag-1960729-om-upphovsratt-till-litterara-och_sfs-1960-729/ [26.05.2024]

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However, copyright applies to works which are part of an act referred to in the first paragraph and are of the following types:

1. *maps,*
2. *works of visual art,*
3. *musical works or*
4. *works of poetry.*

Copyright also applies to a work that is included in an annex to a decision by an authority, if the decision refers to the right to take part in the public document in which the work is included.

We can see the same regulations in **Poland**. Polish Copyright Act (Ustawa o prawie autorskim i prawach pokrewnych):[97] The primary legislation governing copyright in Poland.

Article 4 of the Polish Copyright Act specifies certain works that are not protected by copyright. This includes:

- *Normative acts and their official drafts*
- *Official documents, materials, signs, and symbols*
- *Published patent descriptions and protection certificate descriptions*
- *Simple press releases*

This means that many types of official documents and materials produced by government bodies are not subject to copyright.

In **Ukraine**, the legal framework governing the use of governmental data includes copyright law.[98]

Article 4 of the Copyright law specifies that certain types of works are not subject to copyright protection. These include:

1) *legislative acts and their official drafts;*
2) *official documents, materials, logos, and symbols;*
3) *published patent specifications and industrial design specifications;*
4) *simple press information.*

In **Georgia**, the "Law on Copyright and Related Rights" is the primary legal act regulating copyright and related rights. Specifically, this law governs:

a) Relationships associated with both economic and personal non-economic copyright, which arise from the creation and use of scientific, literary, and artistic works (copyright);

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[97] Available at: http://www.copyright.gov.pl/media/download_gallery/Act%20on%20Copyright%20and%20Related%20Rights.pdf [26.05.2024]

[98] Available at: https://zakon.rada.gov.ua/laws/show/en/2811-20?lang=uk#Text [26.05.2024]

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b) Relationships associated with neighboring rights for performers, producers of phonograms and videograms, and broadcasting organizations (hereafter referred to as neighboring rights);

c) Relationships concerning the rights of database creators.

Copyright protection for collaborative work lasts throughout the lifetime of each co-author and continues for 70 years following the death of the last surviving co-author.

The law broadly protects all types of works under copyright, including databases. However, the law also specifies exceptions to copyright. For Wikimedia, as a knowledge-disseminating organization, an essential governing norm is Article 23 of the law, a quotation exception that allows the use of a work without the author's permission or payment as long as the author and source are properly cited. This provision enables Wikimedia to cite well-known works in articles, given that articles on Wikipedia serve informational purposes. Additionally, there is no restriction on whether the purpose is commercial or non-commercial.

Literature and Methods

To conduct a comprehensive analysis, we examined the legislative frameworks of the specific project countries (Sweden, Georgia, Poland, and Ukraine) and the overarching legislative structures within the European Union (EU). This analysis required an in-depth review of relevant legal texts, including national laws and EU directives, to understand the unique regulatory environments in each country and identify any harmonizing factors provided by EU legislation.

Our approach primarily involved a targeted review of legislative documents, encompassing statutes, directives, case law, and regulatory guidelines specific to each jurisdiction. We collected and checked official government publications, legal databases, and publicly available policy documents that addressed key legal areas relevant to our project's goals, such as copyright policies, Freedom of Panorama, and public sector information regulations.

By gathering and analyzing these documents, we were able to create a refined framework that accommodates both national and EU-wide legal considerations, providing a structured basis for understanding compliance requirements and facilitating strategic recommendations tailored to each country's legislative context.

Conclusion

The study underlines significant variances in how Freedom of Panorama (FoP) and copyright policies are applied across different European Union (EU) member states and non-EU countries (including those who seek to become members of the EU). These differences complicate the goals of open knowledge-sharing platforms, like Wikimedia projects, which depend on free access to cultural content. Key findings indicate that countries like Poland and Sweden have relatively permissive FoP laws, allowing for both commercial and non-commercial uses of images of public works, even though the

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Wikimedia case in Sweden has put the extent of the commercial use in question. In contrast, countries like Georgia and Ukraine impose stricter limitations, with permissions often constrained to non-commercial contexts or subject to complex regulatory exceptions.

The discretionary nature of the EU’s InfoSoc Directive, which permits but does not mandate member states to adopt FoP provisions, has led to a fragmented legal landscape. This fragmentation challenges projects aiming to foster cultural heritage accessibility on a transnational level, as legal compliance requires navigating each country’s specific legislation on FoP and public sector information. This also gives a reason to countries such as Georgia and Ukraine, which are harmonizing their legislation with the EU legislation, not to take steps to allow FoP in the country.

Moreover, the research highlights that restrictive copyright policies may hinder documentation and preservation efforts, especially in regions where cultural heritage is at risk of degradation or loss. The absence of a uniform FoP policy restricts the potential for creating comprehensive digital archives essential for preserving visual records of monuments, buildings, and public art, particularly in vulnerable areas.

A harmonized approach to FoP within the EU and neighboring regions would facilitate compliance processes, maintain cultural preservation efforts, and support the broader mission of accessible knowledge-sharing. Further advocacy for consistent FoP policies could mitigate existing challenges, ultimately facilitating equitable representation of cultural heritage across digital platforms.

Based on the above, we recommend to work nationally with the respectivecountry's legislative institutions to change current legislation and harmonize it with Wikimedia projects for free access to knowledge. Specifically, we recommend:

- **Conduct Research:** invest in comprehensive research to assess the cultural, economic, and social impacts of FoP and copyright of public document restrictions. This research can gather data on how open-access laws in countries with permissive FoP or copyright of public document policies benefit cultural engagement, tourism, and education. Additionally, studies can evaluate the obstacles restrictive policies pose to digital archives and public knowledge access. This research can strengthen the case for harmonized FoP and copyright of public document legislation by publishing findings and case studies.
- **Outreach:** to address the gaps and restrictions in Freedom of Panorama (FoP) and copyright policies, conduct targeted outreach to governmental bodies, cultural institutions, and policymakers in your country. This outreach should emphasize the benefits of open-access policies for preservation of culture and nature as well as knowledge-sharing. Highlight successful examples from countries with more permissive FoP policies and demonstrate how open access supports educational, cultural, and economic objectives.
- **Use Personal Connections:** utilize existing networks and connections with individuals who influence copyright and cultural policy to foster support for more consistent FoP and copyright legislation. Personal outreach to policymakers and

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leaders within the government and cultural institutions can open doors for more targeted advocacy and discussions.

- **Collaborate with Interest Groups:** partner with organizations and advocacy groups focused on digital rights, cultural heritage preservation, and open access to build a coalition that supports FoP and open copyright expansion. Such groups often have established advocacy platforms and resources.

Thus, we have tried to show you how you can conduct an extensive study of the legislation, which can serve as a roadmap for your further work, and recommended ways to achieve the goal of harmonizing legislation.

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Risks

Cultural and natural heritage today faces a range of complex challenges. These issues, largely fueled by urbanization, climate change, tourism, social and political pressures, and war, underscore the vulnerability of heritage sites and artifacts, which can be destroyed in an instant. When heritage is not digitized, this vulnerability presents an even greater challenge for scientists and society as preservation efforts become more difficult and risky.

The Risks working group is focused on understanding the main risks and problems of preserving the cultural and natural heritage and the factors that can affect it.
The main priorities for our working group are:

- *Explore potential difficulties and challenges with making content and data available, security concerns for volunteers, and how to ensure that more information is not used to destroy rather than safeguard.*
- *Analyze the intersection between cultural and natural heritage; how the Wikimedia photo contests can impact more on promoting the safeguarding of cultural and natural heritage, especially the ones in danger.*
- *Identify and compile information about existing cultural and natural heritage institutions and their data sets in the Baltic Sea region, including their licenses. Identify potential partners and relevant stakeholders interested in the digital preservation of natural and cultural heritage in danger in the Baltic Sea region.*

We recognize that the scope of questions is broad and requires an in-depth approach to address each one comprehensively. While this research may not provide all the answers, it will primarily focus on outlining the issues, exploring potential solutions, and offering a logical path forward regarding the necessary direction and methods for progress.

Geographical areas of the research:

- *Baltic countries;*
- *Central & Eastern Europe:*
    - *EU Eastern partnership (Armenia, Azerbaijan, Georgia, Moldova, Ukraine and Belarus);*
    - *Ukraine (as a special case study, the country most affected by ongoing risks).*

This research is partially focused on Ukraine as a case study, as it is a Central and Eastern European (CEE) country currently experiencing a full-scale war. Ukraine's experience is critical for analyzing the real risks and current condition of cultural and natural heritage under threat.

Summary

General perspective.

The Central and Eastern European (CEE) and Baltic regions have extensive cultural and natural heritage resources. More than 120,000 sites have been designated, including national parks, nature reserves, and World Heritage Sites. At the same time, cultural assets include numerous UNESCO World Heritage Sites and European Heritage Label locations. Despite abundant resources, precise statistics on the total number of cultural and natural heritage sites in the CEE and Baltic regions can vary widely across sources due to differing categorizations and conservation statuses.

Unfortunately, a significant portion of these sites face threats. In Central and Eastern Europe, estimates suggest that over 10–20% of natural heritage areas are at risk, primarily from climate change, development pressures, and inadequate conservation funding. Cultural heritage sites are similarly endangered, especially due to urbanization, tourism pressures, and, in some areas, armed conflict. Notably, in the Baltic states, ongoing digitization efforts have begun to mitigate some threats by preserving records and raising awareness. This reflects a growing trend toward heritage protection through digital innovation.

In Central and Eastern Europe (CEE) and the Baltic regions, the digitization of endangered cultural and natural heritage is progressing, but it needs to be more cohesive. Many countries have national digitization strategies, typically coordinated by cultural ministries or agencies, which centralize efforts to digitize immovable cultural heritage like historic sites and monuments. There has been notable progress in 3D digitization, especially in the EU, where many states now use central repositories and digital content management systems to improve cost efficiency and preserve high-quality materials. Over two-thirds of EU Member States, including those in the CEE and Baltic regions, collaborate to meet digital preservation needs, often participating in initiatives that consolidate resources to standardize quality and enhance accessibility of digital archives.

Digitization efforts are supported by initiatives like Europeana, which has become a major digital repository of European cultural heritage. This platform prioritizes high-quality content, but many countries still emphasize quantity over quality, with roughly 15% of digital assets meeting the highest quality standards. Additionally, digitization for public domain materials is encouraged to maintain access and foster public awareness of heritage at risk. However, some areas still have challenges, like limited knowledge and technical barriers.

Although strides have been made, many heritage items remain undigitized, leaving them vulnerable to risks from environmental or man-made factors. Strengthening international partnerships and further investment in technology and training are ongoing goals to ensure the comprehensive digitization and preservation of at-risk heritage across these regions.

The importance of preserving the cultural and natural heritage.

Preserving cultural and natural heritage is essential to maintaining history, identity, and biodiversity. Cultural heritage strengthens community bonds, preserves historical knowledge, and supports social unity across generations. Protecting natural heritage conserves biodiversity, supports ecosystem stability, and provides resilience against climate change.

Both cultural and natural sites contribute to economic growth through heritage tourism, which creates jobs and funds conservation. In times of crisis, these sites offer hope and continuity, making heritage preservation vital for sustainable development and global cultural cohesion.

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- **Biodiversity and ecological balance**: Protecting natural heritage safeguards genetic diversity and ensures the sustainable use of natural resources, supporting environmental health.
- **National and cultural identity**: Heritage conservation is essential for maintaining national identity, cultural awareness, and historical continuity. It also reinforces the country's place in European and worldwide history and traditions.
- **Generational legacy**: Preserving unique natural sites ensures future generations can connect with their cultural and historical heritage.
- **Environmental rights and euro-integration**: Conservation supports the right to a clean, safe environment and aligns with European environmental standards and protected area networks.
- **Irreplaceability**: Once lost, natural heritage cannot be recovered, making its protection critical for long-term cultural and environmental sustainability.

Risks and methods of preserving.

The **key issues** and **risks** facing cultural heritage today include:

- **War and conflict**: The war leads to the destruction of sites, as well as a heightened awareness of the importance of preserving cultural heritage. Military activities, mines, and missile strikes pose serious threats.
- **Weak legislation and lack of oversight (Ukraine's case)**: Current laws are seen as inadequate, with gaps in enforcement, especially following decentralization. There is insufficient state involvement, a lack of specialists, and limited documentation and conservation resources.
- **Monopoly and bureaucracy in archaeology (Ukraine's case)**: Centralized control over archaeological research certification by the Institute of Archaeology has hindered research. At the same time, the illegal trade of artifacts and local authorities' lack of expertise exacerbate the problem.
- **Environmental and climate risks**: Climate change, illegal logging, pollution, and unchecked development impact heritage sites and nature reserves, often needing proper land management or boundary documentation.
- **Public awareness and engagement**: The general public needs to gain awareness of the importance of preserving cultural heritage, with limited educational materials on protected areas and cultural sites.
- **Digital and technological gaps**: Slow progress in digitizing archives and museum collections and opening public access further limits efforts to preserve and share cultural heritage.

The distinction between "digitalization" (preserving and storing digitally) and "digitization" (making it accessible publicly) is crucial here as well. Digital preservation can indeed be invaluable for safeguarding endangered sites or artifacts, creating a backup that might outlast physical deterioration. However, sharing this material publicly without careful consideration can risk exposing sensitive information, potentially leading to misuse, overexposure, or even exploitation.

The act of sharing cultural and natural heritage needs to be handled thoughtfully to ensure that it doesn't undermine the very heritage it's meant to protect. Careful curation, respect for the context, and, in some cases, limitations on access can make a big difference. Digital

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preservation is a powerful tool, but it's only as responsible as the policies and practices that govern its use.

Preserving natural and cultural heritage is crucial for maintaining biodiversity, cultural identity, and historical continuity. Effective preservation methods involve a combination of strategies tailored to address specific risks, protect unique attributes, and promote awareness and respect for these sites. Here’s an overview of common preservation methods for both natural and cultural heritage:

- **Monitoring and protection measures**: Regular monitoring of rare species, conservation actions, patrolling by inspectors, and using camera traps are employed. Public education and awareness are also key components.
- **Establishing protected areas**: Creating conservation areas and enforcing regulations within these zones are standard practices. Environmental education and awareness campaigns support these efforts.
- **Inclusion in the Nature Reserve Fund (Ukraine’s case)**: Listing sites in the Nature Reserve Fund grants them formal protection. Raising awareness about these sites is seen as crucial for their preservation.
- **Documentation and digital preservation**: Efforts include cataloging, researching vulnerable sites, promoting public and scientific access via digital platforms (like GIS), and using 2D and 3D digital archiving. However, there are challenges with conservation resources and expert availability.
- **Community involvement**: Engaging communities to foster understanding and commitment to conservation, alongside legislative support, is also emphasized as a vital approach.

Case study: The Kivik's Museum & Archives Research Institution.

Established in 1890, the organisation is a private, non-governmental, and independent research foundation and is Southern Sweden's sole museum dedicated to conducting research. It holds a unique position in the Nordic region as Sweden's only museum in the Nordic-Baltic Network on Intangible Cultural Heritage (ICH). Additionally, it is the only Scandinavian museum participating in UNESCO’s research group on culture, tourism, and sustainability and the only one accredited to the UN’s Sustainable Development Solutions Network (SDSN) and the SDSN Academy, underscoring its commitment to global sustainability initiatives.

This foundation engages in various global research and educational initiatives with a strong emphasis on sustainability and social impact. It conducts applied research on sustainability, tourism, and resilience to address challenges in these fields. Additionally, it focuses on emigration studies and the social economy, contributing to the understanding of cultural and economic shifts. Educational activities include lectures, workshops, student supervision, and incubation programs, fostering collaboration and peer review among researchers. Partnering with cultural institutions and universities in over 30 countries worldwide, the foundation also works to advance knowledge-sharing and build international networks.

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Dafvid Hermansson, an associate professor and museum director of the institution, shared some of the main findings:

- The foundation has identified a range of emerging risks and challenges for cultural institutions, particularly around the increased exposure of collections through digital platforms like Wikimedia. They report rising insurance fees for museums and similar institutions due to perceived risks from factors such as NATO-related conflicts, climate change, and the digital sharing of collections. This openness has led to more violations, damages, and thefts of cultural sites and museum items. Furthermore, the digital dissemination of cultural images has led to issues with historical falsification, infringement of intellectual property rights, and economic devaluation.
- Another critical finding is the apparent lack of risk awareness and preparedness in cultural institutions, which may be due to prolonged periods of peace that have left some institutions less vigilant. This has been compounded by increased gentrification, where local knowledge of best practices and preservation strategies among politicians, institutions, and communities remains low, further complicating heritage protection.

Sharing knowledge has been central to human society, supporting progress and connecting communities. However, some may exploit shared knowledge for individual gain, raising concerns over how we can protect cultural heritage in an increasingly accessible world. There is a pressing need for research and heightened awareness of the risks that come with sharing cultural information. Key issues include:

1. **Overexposure to cultural sites**: The COVID-19 pandemic highlighted vulnerabilities as increased visits damaged fragile areas. Overcrowding, or "overtourism," and related gentrification affect the integrity and local context of cultural sites globally.
2. **Commercialization and "Disneyfication"**: Many cultural sites are losing authenticity through commercialization, with traditional practices or intangible cultural elements being modified for visitor appeal. This often leads to disregard for the rights of original practitioners and communities associated with these sites.
3. **Conflict and cultural erasure**: Warfare has shown that cultural knowledge, once shared, can be targeted strategically by aggressors to erase collective memories, as sites of historical and cultural significance are deliberately destroyed.

These risks underscore the need for balanced policies on sharing and protecting cultural heritage, promoting accessibility while safeguarding against damage, disrespect, and exploitation.

Ukraine as a case study.

As of 2024, Russia's full-scale war against Ukraine has caused extensive damage to its cultural and natural heritage, impacting thousands of sites. At least 1,100 cultural and religious buildings, such as museums, historical landmarks, and churches, have sustained partial or total destruction.

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According to UNESCO data, in 2 years, the culture and tourism sector has lost over $US 19 billion in revenue, and the cost of damage, particularly to cultural property, amounts to almost $US 3.5 billion. According to the latest UNESCO assessment (February 2024), nearly $US 9 billion will be needed over the next 10 years to recover this sector.

The damage has been particularly severe in regions like Kharkiv, Donetsk, and Luhansk, where sites registered with UNESCO, including the Sviatohirsk Lavra and other iconic cultural institutions, have suffered from direct attacks and bombing. Also, the Ivankiv Historical and Local History Museum, the Transfiguration Cathedral in Odesa, and the Historical building of the regional youth center are examples of the most damaged ones.

Meanwhile, the natural heritage and the Ukrainian ecosystem are also being harshly violated or under a huge risk, covering more than 44% of the territory. Around 30 protected territories have been affected by military operations or Russian occupation. The most notable examples are the Kakhovka Dam, Askania-Nova Nature Reserve, and others. These include extensive damage to ecosystems, particularly in protected natural areas that serve as habitats for endangered species.

Through the eyes of a Ukrainian environmental journalist supported and hired by UNESCO, detailed reporting on the current condition of Ukraine's eight biosphere reserves has emerged. Even in areas not close to the front line, the situation is increasingly difficult for bio-diversity and the communities that benefit from it: loss of income due to the restriction of ecotourism for evident safety reasons, reprioritization of funds that used to be allocated to environmental protection and staff shortages resulting from a combination of salary cuts for staff and the departure of inhabitants from the biosphere reserve.

International bodies like UNESCO and Ukraine's Ministry of Culture are actively documenting these damages to advocate for protection measures and potential reparations. The situation underscores the urgent need to preserve heritage and increase international support for Ukraine's conservation efforts.

The Russian invasion has had a profoundly negative impact on the preservation of Ukraine's natural and cultural heritage. Key effects include:

- **Destruction of heritage sites**: War has led to the physical destruction of numerous cultural monuments, especially in conflict zones and occupied areas, including the looting of museum collections and illegal archaeological excavations.
- **Environmental damage**: Ecosystems have been heavily affected by pollution from explosive materials, deforestation, noise pollution from military exercises, and the forced migration of wildlife due to combat activities.
- **Loss of conservation resources**: Conservation efforts have suffered due to diverted funds and personnel who are now focused on defense, leading to inadequate protection for heritage sites.
- **Challenges in monitoring and protection**: Active conflict has made it impossible to monitor and protect heritage in many regions, notably in Sumy and Crimea. Occupied territories lack conservation oversight, and agricultural and construction pressures on ecosystems in safer zones have intensified.
- **Digital preservation**: The war has, however, accelerated efforts to digitize museum collections and archives to preserve cultural heritage in case of further destruction.

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These challenges underscore the need for more active state involvement, better legal frameworks, and public education to protect Ukraine's heritage effectively.

Moreover, **Ukraine is currently leading in digitizing archival information**, even amid the challenges posed by the ongoing war. In the absence of a government budget, the country has successfully digitized 21 million archival items in 2024, which is the 1st place worldwide compared to other countries, intending to reach 30 million next year. This initiative reflects Ukraine's commitment to preserving its cultural heritage and historical records, particularly in times of conflict.

This remarkable achievement demonstrates the effectiveness of collaboration among various institutions and the use of digital technology to safeguard cultural heritage. The digitization efforts not only enhance access to valuable information but also contribute to the protection of this heritage against the backdrop of war.

There are also discussions on preserving Ukrainian cultural heritage amid the war, focusing on **conservation versus restoration**. While restoration aims to restore the original appearance of heritage sites, conservation serves as a cost-effective interim solution to halt further damage. This approach allows for stabilizing historical structures until full restoration becomes feasible. Conservation requires fewer resources, making it crucial under current limited funding and security challenges. Experts emphasize the conservation of heritage sites damaged by conflict to prevent irreversible decay.

Overall, the war has highlighted significant risks to both natural and cultural heritage and has led to intensified efforts for digital conservation, though many sites continue to face severe threats.

Although war poses a significant threat to heritage, it also opens new opportunities for digitization and international collaboration.

Security concerns for volunteers.

Photographers and volunteers play essential roles in preserving natural and cultural heritage, acting as documenters, advocates, and active participants in conservation efforts.

For example, **capturing heritage at risk** (document sites, landscapes, and artifacts at risk, creating visual records highlighting their current state. This documentation is invaluable, particularly when heritage is vulnerable to destruction or degradation due to conflict, climate change, or neglect); **raising awareness** (through exhibitions, publications, and social media, photographers share images that bring global attention to endangered heritage. Iconic photos of affected areas often inspire public support and mobilize resources for conservation efforts); **creating visual archives** (the images serve as historical records, preserving cultural sites and natural landscapes' appearance and details that may change or disappear over time. Such archives are crucial for future generations and potential restoration work); **rapid response in crisis situations** (can be as crucial first responders in the event of disasters — natural or human-made. They may help stabilize or protect heritage sites from further damage, such as sandbagging vulnerable areas or securing cultural artifacts).

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*But how do we ensure **total security for the volunteers** while they are trying to make their contribution to preserving the heritage?*

For this research, we reached out to participants of the Wikimedia photo contests, Wiki Loves Earth, Wiki Loves Monuments, and others who have experience photographing natural and cultural sites. We asked them about the risks they faced, what factors made them feel secure, and their general experience during their photography in natural or cultural sites.

General experience in photographing natural or cultural heritage.

The experiences of photographers underscore that photographing natural protected areas and cultural heritage sites is indeed different from non-protected areas. The need for thoughtful, respectful photography in these spaces enriches the experience, allowing photographers to engage more deeply with the cultural or ecological importance of the location. While the process can involve additional challenges, many photographers feel that these restrictions add a unique value and responsibility to their work, inspiring a heightened awareness of photography's role in safeguarding heritage.

Based on the 47 responses, ***28% of respondents faced risks*** or situations threatening their health or life while photographing natural or cultural heritage sites, while ***72% did not encounter*** such threats.

Potential **physical risks** encountered while photographing cultural or natural heritage sites *(based on the received responses)*:

- **Falls and injuries**:
  - Tripping, falling from vantage points, or uneven terrain (e.g., tripping and requiring medical help, risk of falling from heights, stumbling to find good angles);
  - Specific incident: falling 15 meters from a wall.
- **Physical access risks**:
  - Risk of entering restricted or poorly maintained areas, risking safety due to overgrown greenery, damaged structures, or steep terrain (e.g., steep rocks, crumbling ruins);
  - The temptation to take risks to access unique perspectives or vantage points;
  - Difficulty identifying locations due to lack of information or accessibility, complicating logistics and planning;
  - Concerns over not having credentials like a press card, which may limit access to specific sites or areas within institutions.
- **Getting lost**:
  - Navigational challenges, especially in natural reserves or remote areas (e.g., becoming lost, potential dehydration, risk of dangerous animal encounters).
- **Weather conditions**:
  - Sudden or extreme weather changes impacting accessibility and safety (e.g., heavy rain causing accidents, challenging mountain weather).
- **Animal encounters**:
  - Encounters with potentially dangerous wildlife, or in areas with bird shooters (e.g., trying to photograph a moose, facing bird shooters).
- **Human conflicts and legal risks**:

    - Encounters with individuals who questioned or opposed photography activities (e.g., accusations of espionage, local residents' unfriendly behavior);
    - Legal risks when photographing in areas with strict regulations or prohibitions;
    - Legal risks, such as the potential for trespassing or violating property rights, particularly in restricted or privately owned areas;
    - Requests or demands to delete photographs due to perceived rule violations or suspicions of espionage (e.g., needing to know local photography rules, requests to erase images).
- **Environmental and site-related hazards**:
    - Poorly maintained or abandoned structures pose risks (e.g., difficulty in accessing cultural sites and risk of building collapse);
    - Specific hazards like mining areas affect accessibility;
    - Potential hazards related to the condition of buildings and natural environments, such as sites affected by military activity or structurally unstable areas, increase collapse risks.

Overall, these experiences highlight the need for preparedness, awareness of surroundings, and adherence to safety protocols when photographing in remote or regulated heritage areas.

Potential **emotional and mental risks** encountered while photographing cultural or natural heritage sites *(based on the received responses)*:

- **Safety and security concerns**:
    - Anxiety when photographing alone or in unfamiliar, unpopulated, or potentially unsafe areas, especially as a woman (e.g., feeling unsafe when alone, fear of kidnapping or abuse);
    - Concerns about being questioned or accused of suspicious behavior by security, police, or locals (e.g., being mistaken for a spy or terrorist, risk of arrest);
    - Risks associated with being perceived as a government opposition or engaging in suspicious activity;
    - Potential theft concerns when carrying equipment in public or isolated areas.
- **Cultural and social tensions**:
    - Negative interactions with residents or property owners when photographing in private or culturally sensitive areas (e.g., facing unpleasant attitudes from locals, feeling misunderstood or questioned);
    - Language barriers or unfamiliar cultural norms cause stress or misunderstandings.
- **Fear of breaking the rules and legal issues**:
    - Stress-related to photography restrictions, especially in areas with strict legal constraints, creates anxiety over rule-breaking (e.g., limitations due to lack of freedom of panorama, fear of deleting photos if requested by authorities).
- **Frustration and disappointment**:
    - Feelings of disappointment after investing time and effort to reach a location, only to find that the anticipated shot is unachievable;
    - Anger or sadness from witnessing damage or neglect of heritage sites.

At the same time, the surveys also identified **positive emotional impact**. Many respondents found emotional fulfillment and relaxation from their experiences, with some feeling satisfaction and pride in capturing meaningful images of cultural and natural heritage.

While photographing cultural and natural heritage sites can bring fulfillment and enjoyment, photographers face emotional risks, including safety concerns, legal limitations, and frustration from difficult circumstances.

Despite these challenges, many find ways to cope by planning ahead or viewing challenges as learning experiences. The proactive approach to managing potential risks emphasizes preparation, respect, and adaptability, enabling photographers to work effectively while preserving both their safety and the integrity of the sites.

We asked the volunteers how they resolved the risks and which factors would make them feel secure during their photography, as well as the regulations that they are lacking, as they will appear as crucial points of understanding volunteers' needs.

Regulations, policies, or knowledge and needs desired for safe photographing of cultural or natural heritage sites *(based on the received responses)*:

- **Caution and safety measures**:
  - Avoiding solo travel, especially to isolated or potentially hazardous areas. Bringing a companion or preparing first aid kits for emergencies;
  - Using past experience and careful judgment in risky situations, including mountain rescue assistance when necessary;
  - Maintaining caution with positioning and equipment, such as securing tools and avoiding leaning too far over edges;
  - Ensuring physical preparation, backup gear, and a health-conscious approach.
- **Personal confidence and experience**:
  - Experience handling challenging environments, such as mountains or large crowds, and a confident, communicative approach to potential conflicts;
  - Acknowledgment of personal resilience and preparedness to deal with risks boosts a sense of security.
- **Transparent communication and respectful engagement**:
  - Diplomatic interactions with locals, including being polite, explaining intentions, and respecting customs. Also, collaborating with locals for guidance and tours;
  - Direct communication with authorities, using formal requests (like letters) for photography permission or access;
  - Managing conflicts by staying calm, utilizing conflict management skills, and, where necessary, de-escalating interactions;
  - Reassessing and adjusting plans as needed when unexpected challenges arise;
  - Remaining flexible in the event of image deletion from platforms, as this can be outside personal control.
- **Clear access rules**:
  - Access clarity for heritage sites, especially regarding restricted or sensitive areas, like nature reserves, private properties, or regions with war-related restrictions;

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    - Easier access for volunteers to public monuments not generally open to the public, including clearer signage for heritage sites and permissible zones.
- **Legal and ethical guidelines**:
    - Understanding freedom of panorama policies for various countries, especially regarding public interiors and monuments;
    - Regulations on photographing private property, people and obtaining necessary permissions, including the need for more accessible guidelines on these matters;
    - Need for formal identification, such as a press card or introduction letter, to navigate restricted sites or sensitive areas;
    - Promoting ethical guidelines, especially for nature photography, to prevent disturbance of species and habitats; advising photographers to note if subjects are protected or captured in captivity;
    - Adherence to "Outdoors code" principles (leave no trace, capture memories, no harm to wildlife) for minimal impact and sustainability, particularly in wildlife photography;
    - Increasing funding for content creators to expand documentation across more areas and improve site access.

With these factors, photographers feel safer and more comfortable working in diverse environments, ultimately improving the quality of their work while respecting and preserving heritage sites.

By addressing these regulatory and information gaps, photographers would be better prepared to navigate heritage sites responsibly and legally, minimizing potential conflicts and risks.

Photographing in war, conflict, or sensitive areas *(Ukraine's case study example).*

Under martial law, certain rights and freedoms are suspended, leading to heightened suspicion towards individuals, particularly those documenting events related to military activity. This environment of distrust can arise from personal experiences connecting the presence of outsiders with attacks or military actions.

For individuals taking photographs out of curiosity or for participation in photography contests, the risks are considerable. They may encounter issues with law enforcement due to the restrictions in place. This underscores the need for careful consideration and awareness of the legal and social context when engaging in photography in conflict zones.

Serhii Petrov is a Ukrainian historian, journalist, photographer, and active contributor to Wikipedia who has documented Russian war crimes in the Kharkiv region.

His extensive experience in capturing images of sensitive sites and documenting evidence has given him a unique perspective on safety precautions for photographers working in conflict zones.

Some of his findings and advice are the following:

During martial law in Ukraine, there are **specific restrictions on photo and video recording**, which vary by region and proximity to conflict zones:

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    - Restrictions differ across regions and even within parts of each region (especially near frontlines or borders);
    - Generally, there are fewer restrictions in large and medium cities; however, photographing military sites remains prohibited;
    - In large cities near the frontlines, photographing industrial sites is not allowed;
    - Non-local photographers in rural areas may be detained for security checks, so it is crucial to consider this risk;
    - Law enforcement may design certain areas as high-risk zones, where photography could be more strictly controlled;
    - Rural areas within 50 km of frontlines or borders: photographing administrative, educational, medical, transportation, and infrastructure facilities is discouraged in these areas;
    - Military accreditation from the Armed Forces of Ukraine (AFU) is recommended for such activities;
    - Even local residents in rural areas within 20-30 km of the frontlines or borders may face restrictions on photography.

However, capturing the aftermath of destruction to residential and civilian infrastructure caused by attacks is allowed. Taking photos immediately following an incident may be inappropriate, as the area may still be hazardous.

Tips and guidelines for safely photographing in sensitive or conflict areas that help ensure the safety of civilians and prevent the exposure of sensitive locations:

- **Letter of support**:
    - Obtain a letter from an organization (e.g., Wikimedia Ukraine) stating the purpose of the photography. This can help demonstrate the intent.
- **Plan the route carefully**:
    - Map out the route in advance to avoid restricted or high-risk areas.
- **Positive communication**:
    - Interact positively with people around you, building trust and understanding.
- **Avoid over-questioning**:
    - Engage in friendly conversation without probing too much, which can help avoid suspicion.
- **Travel with a partner or group**:
    - Being part of a pair or group can increase safety and reduce the likelihood of seeming suspicious.
- **Safety precautions**:
    - Wear protective gear like a helmet when photographing around or inside damaged buildings.
- **Upload with time delay**:
    - For safety and operational security, consider uploading photos with a delay to avoid revealing recent locations or current conditions.

These strategies can help enhance security and make photographer's work more transparent to locals and officials alike.

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Wikimedia photo contests in safeguarding the heritage.

The "Wiki Loves Earth" and "Wiki Loves Monuments" competitions are important tools for raising awareness about natural and cultural heritage.
Each year, contributors share thousands of images capturing nature-protected areas and cultural heritage sites, significantly raising awareness of these locations. By uploading these images, individuals can play a vital role in preserving history for public knowledge and archival purposes. The importance of documenting is highly increasing when there is a risk of the objects being destroyed or, for example, this object might lack any existing illustrations on Wikipedia.

Case study: Image from Wiki Loves Monuments in Ukraine.

In 2023, one of the participants of the Ukrainian Wiki Loves Monuments photo contest, Viktor Polyanko's digitized photo from June 6, 2006, became the only visual record of a historic house from the village of Tukhulka, Lviv region, after the building was destroyed by fire in September of the same year.

This submission to a special nomination called "Photographic Film" in a heritage photography competition provided invaluable documentation for Wikipedia, underscoring how even amateur or personal photos can serve as the sole visual records of cultural sites, particularly those that might be altered, restored, or lost over time.

This example serves as one of the thousands of existing ones worldwide.
The call-to-action encourages people to consider that their photos — even those taken on a phone — can contribute to documenting historical landmarks and changes like repairs, restorations, or reconstructions.

Wiki Loves Earth, and Wiki Loves Monuments mainly contribute by:

- **Increasing public engagement**: By encouraging people to photograph and document heritage sites, these competitions help communities connect with their natural and cultural surroundings, fostering a sense of responsibility toward preservation.
- **Expanding digital archives**: The photos and documentation submitted serve as a valuable resource for Wikipedia and online archives, making information about heritage accessible to a global audience, which is especially important for sites that may be at risk.
- **Promoting preservation efforts**: Participation often drives interest in conservation, leading individuals to become advocates for protecting local heritage. Competition can also generate awareness among policymakers about the importance of allocating resources to heritage protection.

- **Encouraging sustainable tourism**: Highlighting natural and cultural sites through these platforms can encourage tourism that respects and values heritage, aligning tourism efforts with conservation goals.

Case study: International Wiki Loves Earth.

Based on Wiki Loves Earth International organising team presentation in 2019, the contest **specifically benefits and harms the environment**.

Benefits:

1. **Raising awareness:** WLE helps attract general public attention to the problems of nature, it's a good media story and steers Wikimedians towards this topic; good visibility on the Wikimedia projects.
2. **Monitoring issues:** In some countries, governments do a poor job monitoring the condition of natural heritage sites; in this case, Wiki Loves Earth might be helpful.
3. **Documenting nature evolution:** Even natural heritage sites might getdestroyed. More often, their shape might evolve (think global warming); Wiki Loves Earth helps document that.

Harms:

1. **Incentive to violate rules:** Participants may violate rules of the nature areas or behave unethically.
2. **Wildlife & habitat disturbances:** Participants may disturb animals & plants. Also, theoretically, sensitive information about animals & plants might be used with malicious intent.
3. **General environmental cost:** Any large-scale Wikimedia activity incurs some negative cost for the environment by itself. Most obvious example — more than 950 thousands photos on the servers, and ¾ of them not used in the wikis; people travel specifically to take photos.

What are the possible solutions?

- **Discouraging rule violators:** Organizers might disqualify photos and their authors in case of an obvious violation.
- **Working with professionals:** To minimize disturbance and damage to nature, we should involve more professional folks in the process. Example — organized photo walks.
- **Encourage illustrating less documented areas:** We should encourage participants to focus on the sites not illustrated yet — as opposed to taking a 10,001st photo of a well-known area. Example — Ukraine assigns much less weight to photos of already illustrated sites when determining winners for quantity.
- **Drones usage:** Promoting a wider use of drones for photographs is a debatable solution. On the one hand, it can reduce the level of disturbance for animals &

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plants on the ground; however, regulations of some protected areas forbid the use of flying objects.

Special nomination "Human Rights and Environment".

Since 2021 Wiki Loves Earth International supports the initiative WikiForHumanRights, which partners with the Wikimedia Foundation (WMF) and the Office of the High Commissioner for Human Rights (OHCHR) and holds a special nomination, called **"Human Rights and Environment"**.
Its goal is to raise awareness of nature protection and human impacts on nature.
When we protect the environment, we also protect the fundamental human rights we all have — rights to water, life, food, housing, and other fundamental rights that rely on a clean, healthy environment.

This special nomination gathering images that capture the following:

- *Humans engaging in activities that rely on a healthy environment or a protected environment (such as livelihoods engaged in sustainable agriculture or fishing practices, sustainable construction, exercise in or enjoyment of natural spaces, etc.);*
- *Human activity that restores or helps an ecosystem or environment recover from previous damage (i.e., tree planting, waste collection, sustainable management of the land, removing invasive species, etc.);*
- *The negative effects of global environmental issues, such as climate change, biodiversity loss, or pollution, on maintaining environmental and human health (i.e., natural disasters like flooding, landslides, and wildfires, impacts of pollution, waste accumulation);*
- *How human activity infringes on the natural systems we rely on for human and environmental health through extractive industries (such as forestry, mining, and destructive agriculture), construction of destructive infrastructure (i.e., dams and roads), or other activities;*
- *Where fragmenting or disappearing landscapes highlight ecological damage or loss that affects human well-being (i.e., invasive species, damaged waterways, soil loss, etc);*
- *People advocating for, protecting, or educating others about how a healthy environment is important for our collective well-being and the well-being of future generations.*

Not only people from participating countries, but worldwide can upload such an example of the image. And the contest is receiving thousands of the pictures yearly, including the **images of the protected areas that faced a crucial risks**.

1. Results in 2021
2. Results in 2022
3. Results in 2023
4. Results in 2024 (TBA)

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In addition to collecting images of heritage and nature-protected sites, these contests emphasize the importance of using these photos to enrich relevant Wikipedia articles. While many participants contribute photos, it's less common for them to take the extra step of adding these images to Wikipedia pages that would benefit from them. Encouraging this practice not only enhances the articles but also boosts accessibility to information, helping to visually document sites and structures that may be underrepresented or at risk. This integration of images is essential for building a richer, more comprehensive resource on cultural and natural heritage for the public.

Therefore, "Wiki Loves Earth" and "Wiki Loves Monuments" play a crucial role in the preservation ecosystem by engaging the public, enriching digital heritage records, and driving both grassroots and policy-level support for safeguarding heritage.

The ongoing promotion of these initiatives can strengthen global and local support for heritage preservation, especially in regions affected by conflict or lacking resources for conservation.

Review of Literature

The topic of safeguarding cultural and natural heritage is quite complex and relevant at any time. It also has a place in the Wikimedia movement discussions; some of them are:

- **Wake up call for heritage at risk:** Cultural heritage buildings, monuments, and sites are increasingly exposed to major problems and threats: armed conflicts and wars, natural disasters, climate change, pollution, mismanagement, and uncontrolled activities. This session explored the possibilities offered by open platforms and tools to monitor and assess these threats and raise awareness among local communities.
- **WHindanger:** Involving local communities in the documentation of their World Heritage sites in Danger on Wikimedia projects through participatory methods and fostering the accessibility of relevant audiences to the created content through building a non-tech-friendly platform that includes maps, graphs, and statistics generated by Wikidata, and access to articles and photo galleries.

Methods.

This paper has been developed based on **insights from surveys, interviews**, and **direct discussions** with institutions, organisations, and individual experts in the field.
We launched five surveys focusing on:
- CEE and Baltic Sea region's institutions focused on cultural heritage **(2 responses)**;
- CEE and Baltic Sea region's institutions focused on natural heritage **(2 responses)**;
- Ukrainian institutions focused on cultural heritage **(5 responses)**;
- Ukrainian institutions focused on natural heritage **(5 responses)**;
- Participants in WLE and WLM photo contests **(47 responses)**.

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It also analyzes **data from existing projects, research initiatives, findings**, and **working group meetings** to comprehensively overview challenges and best practices in preserving cultural and natural heritage.

Conclusion

The preservation of natural and cultural heritage in the Central and Eastern European (CEE) and Baltic Sea regions is both complex and critical, with diverse institutions, organizations, and local communities dedicated to safeguarding these invaluable assets. These regions, marked by a rich tapestry of historical landmarks, traditional practices, and biodiverse ecosystems, are under threat from various forces, including environmental change, modernization, and, as recent events underscore, armed conflict. Yet, despite the dedication of numerous groups, significant obstacles remain to effective preservation. Many of the entities responsible for heritage preservation face accessibility issues, both in terms of public awareness and the ability to coordinate across borders. Consequently, sharing knowledge, resources, and best practices between organizations remains limited, hampering efforts to build comprehensive conservation strategies that could protect this heritage on a regional scale.

The devastating impact of Russia's ongoing war in Ukraine on cultural and natural heritage is an urgent reminder of the vulnerabilities facing these regions. Armed conflict not only disrupts lives and infrastructure but also causes irreparable harm to historical sites, archaeological artifacts, religious landmarks, and unique natural landscapes. In Ukraine, numerous cultural sites have been damaged or destroyed, erasing irreplaceable pieces of history and identity for local and global communities. The war highlights the pressing need for international agreements and protective measures that can mitigate the risks to heritage during conflicts. These protections could take the form of treaties, stricter enforcement of existing cultural heritage protection laws, and increased collaboration with international bodies like UNESCO, which can mobilize resources and expertise during times of crisis.

Furthermore, individuals such as volunteers and photographers play an essential role in documenting and preserving heritage, often stepping in where institutions lack capacity. Their grassroots efforts capture invaluable data on both cultural and natural sites, providing detailed records that can be critical for future restoration and educational purposes. However, these individuals often operate in precarious conditions, especially in conflict zones or regions with limited regulatory frameworks to ensure their safety. Protecting these frontline advocates is crucial, as their work not only preserves physical records of our shared history but also raises awareness among the broader public. By implementing support systems—such as safety training, secure access, and legal protections for volunteers and documentarians—nations can better facilitate these efforts and foster a culture of preservation that resonates through communities.

In addition to protection in times of conflict, long-term preservation requires sustained, cross-border collaborations. Countries in the CEE and Baltic regions share interconnected histories, landscapes, and cultural legacies. By fostering partnerships across these nations, it is possible to develop innovative approaches to conservation that respect both natural ecosystems and cultural identities. Collaborative initiatives could include shared databases of cultural sites, cross-training programs for heritage workers, and joint funding applications to secure financial resources for large-scale projects. Such cooperation would also encourage a shared sense of responsibility and deepen the commitment to preserving the region's heritage for future generations.

In conclusion, the preservation of natural and cultural heritage in the CEE and Baltic regions is a multi-faceted endeavor that requires cooperation, innovation, and robust protective frameworks. The threats posed by armed conflict, modernization, and accessibility barriers underscore the need for urgent action. By enhancing the safety and support for volunteers, encouraging international collaboration, and building resilient systems that can withstand both conflict and time, these regions can protect their heritage and continue to pass down their histories, traditions, and landscapes to future generations.

Reflections

For the long-term perspective and future project findings, there are still some open questions, topics to discover, and opportunities to reflect on:

Creative Europe grants opportunities: they play a significant role in preserving cultural and natural heritage by providing essential funding and support to projects that promote cross-border collaborations, innovative preservation techniques, and sustainable tourism.

Conducting a field inventory: to enhance heritage protection efforts, future projects could benefit significantly from conducting a field inventory to document the current condition of heritage sites within at least one pilot community. This approach would offer up-to-date, on-the-ground data about these sites' states, helping prioritize conservation needs. Publishing the results would also make this information accessible to a wider audience, including policymakers, heritage professionals, and local communities, encouraging informed actions toward preservation and raising awareness of the heritage status in that region.

Security training for photographers and volunteers: such trainings for volunteers working in cultural and natural heritage sites can play a critical role in ensuring personal safety and the protection of sensitive locations. Offering this type of training before heritage documentation projects can safeguard both individuals and the sites they document, supporting responsible and respectful preservation efforts.

More extensive initiative for exploring: a large-scale research project focusing on digitizing and preserving cultural and natural heritage could significantly enhance understanding and strategies for heritage management. This project could expand research to a broader range of regions within the CEE and Baltic areas and beyond to assess diverse approaches and challenges.

Wikipedia as a platform for preserving: more complex research on why Wikipedia is safe or unsafe for cultural and natural heritage preserving. A free platform which can be dangerous to cultural and natural heritage as it can be used for every purpose a human mind can set up.

CONTRIBUTORS

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