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PROCULTHER-NET 2

PROTECTING CULTURAL HERITAGE FROM THE CONSEQUENCES OF DISASTERS - NETWORK

TECHNICAL BULLETIN

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2

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PROCULTHER-NET 2

PROTECTING CULTURAL HERITAGE
FROM THE CONSEQUENCES OF DISASTERS - NETWORK

PROCULTHER-NET 2 is co-funded by the Directorate-General for European Civil Protection and Humanitarian Aid Operations - DG-ECHO under the European Union Civil Protection Mechanism - UCPM, and implemented by a Consortium led by the Italian Civil Protection Department (Italy) in collaboration with the Ministry of Interior-Disaster and Emergency Management Authority - AFAD (Türkiye), the German Archaeological Institute – DAI (Germany), the Ministère de l'Intérieur - Direction Générale de la Sécurité Civile et de la Gestion des Crises (France), the Fondazione Hallgarten - Franchetti Centro Studi Villa Montesca, the Ministry of Culture and Tourism of the Region Government of Castilla y León (Spain), the Federal Agency for Technical Relief - THW (Germany), the University of Porto - UPORTO (Portugal) and the Suor Orsola Benincasa University - UNISOB (Italy).

Building on the experience and lessons learnt by the previous PROCULTHER EU-funded initiatives implemented under the framework of the Union Civil Protection Knowledge Network- UCPKN, PROCULTHER-NET 2 aims at implementing the pathway mapped out by the PROCULTHER-NET project to consolidate the inclusion of the protection of cultural heritage at risk in the UCPM processes and structures, so as to increase disaster preparedness capacities and knowledge at European and national levels.

The ongoing phase, running from January 2024 to March 2026, moves forward to consolidate and further expand the thematic community on the protection of cultural heritage at risk established within the UCPKN, namely for defining elements for its sustainable governance and functioning.

*Join the KN and find out more on **PROCULTHER-NET**!*

FOREWORD

By Katariina Leinonen,
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Photo courtesy of the author

It is a great honour to introduce the sixth issue of the PROCULTHER-NET Technical Bulletin, which has become a valuable information platform for professionals committed to the protection of cultural heritage at risk - a task that is both about preserving memory and about fostering peace, resilience and recovery.

Cultural heritage is a source of identity, cohesion and resilience for communities worldwide. Protecting heritage helps preserve the social fabric and support recovery. Its destruction fuels division and erases the symbols around which communities rally. Today, we are witnessing how cultural heritage is increasingly and deliberately targeted in conflicts - from Gaza to Sudan, from Ukraine to other crisis-affected regions - reminding us that safeguarding heritage is inseparable from protecting human dignity and shared values. Engaging on cultural heritage supports sustainable recovery and strengthens the overall resilience of societies.

In this endeavour, the EU's Common Security and Defence Policy (CSDP) missions and operations, together with the EU Delegations, play a key role alongside partners on the ground, working to integrate cultural heritage protection into conflict prevention, crisis response and peacebuilding efforts. Initiatives such as PROCULTHER-NET are essential allies in this effort. They connect practitioners across Europe and beyond, foster operational knowledge, and test practical solutions for protecting cultural heritage at risk. The contributions gathered in this issue are proof of the expertise, creativity and commitment that drive this community of practice forward.

I warmly thank all authors, partners and practitioners who contribute to this collective endeavour. Their dedication strengthens not only the protection of cultural heritage, but also our shared commitment to peace, resilience and human solidarity.

INTRODUCTION

By Editorial Committee

Dear Readers,

In the Summer of 2025, the PROCULTHER-NET 2 project successfully delivered another edition of the Protecting Cultural Heritage course (PCH) to 64 trainees from 23 UCPM countries. During the training week in Caserta, Italy, we once again witnessed the high level of efficiency that can be achieved when cultural heritage and civil protection experts collaborate closely. This is precisely the objective that the Technical Bulletins have been striving to achieve for the past three years: to share practical experiences in the protection of cultural heritage in crises, to inform the thinking and practices of civil protection and cultural heritage experts alike.

1. A moment from the 2025 PCH course © DPC

This sixth issue of the Technical Bulletin opens with a foreword from the European External Action Service - EEAS, which reaffirms that the protection of cultural heritage transcends national and European borders, particularly in times of conflict. The two highly practical examples that open our **FOCUS ON** section demonstrate this perfectly. The first one exemplifies how a third-party international non-profit organisation, such as the ALIPH Foundation, can play a pivotal role in implementing on-the-ground measures for the emergency protection of cultural heritage during an armed conflict. The second article illustrates how the decades-long, unique experience of the Carabinieri Command for the Protection of Cultural Heritage - TPC has been deployed in post-conflict areas such as Kosovo and Iraq to combat illicit trafficking.

The **PREVENTION** section features a Polish article on basic prevention measures to safeguard historic wooden houses in rural areas likewise underlines the importance of protecting vernacular cultural heritage, which is often unlisted and in the care of private owners.

In the **PREPAREDNESS** section, we discover the role played by French grassroots organisations such as Blue Shield France and the French Association for Disaster Risk Prevention - AFPCNT in raising awareness of risks and promoting a culture of resilience among private owners of cultural heritage, alongside civil protection authorities.

2. Devastation caused by a bombing on a street in Kharkiv, March 3 © Andriy Marienko

In addition, this section highlights the initiatives taken by Croatia in the aftermath of the 2021 earthquake, which served as a wake-up call. In line with the recent articles on Romania[1] and Hungary[2], the first article discusses the steps taken by both civil protection and cultural heritage authorities to reassess their procedures, drawing on the experiences of other European countries. The second article is a contribution from the Croatian Civil Protection Directorate, which shares lessons learned from two training exercises designed to enhance preparedness and foster collaboration between civil protection and cultural heritage experts. Finally, the section closes with an article focusing on the efforts of the Tuscany and Marche regions of Italy to develop specialised civil protection mobile units with specific equipment for use in heritage protection during emergencies.

[1] A. Pop, Key steps to protect cultural heritage. Elements of specific legislation in Romania, in *PROCULTHER-NET Project 2. Technical Bulletin N. 5, July 2025*. pp. 76-82. ISSN2975-190X- ISBN 978-88-6864-548-9 [***https://civil-protection-knowledge-network.europa.eu/media/key-steps-taken-protect-cultural-heritage-elements-specific-legislation-romania***] Accessed 22 October 2025.

[2] Lt. Col. G. Domján, Experiences in capacity building of cultural heritage rescue in Pécs, Hungary, in *PROCULTHER-NET Project 2. Technical Bulletin N. 5, July 2025*. pp. 83-90. ISSN2975-190X- ISBN 978-88-6864-548-9 [***https://civil-protection-knowledge-network.europa.eu/media/experiences-capacity-building-cultural-heritage-rescue-pecs-hungary***] Accessed 22 October 2025.

3. Recovery interventions © IVCR+i

The **RESPONSE** section takes us to Belgium to explore the lessons learned from the devastating floods of 2021. The KIK-IRPA article analyses the gaps identified in response processes and elaborates on the measures that have been implemented in recent years to address them and enhance the response capacities.

Finally, in the **RECOVERY** section, we are pleased to present to you the second part of the article on the 2024 floods in the Valence community[3] illustrating recovery actions implemented by the Valencian Institute of Conservation, Restoration and Research which focuses on stabilizing the documentary heritage and future measures. This valuable testimony is one of the first contributions on this subject to be shared at the European level, and we hope it will help experts in other countries to prevent, plan for, prepare for, respond to, and recover from disasters affecting cultural heritage more effectively.

We thank all the authors and reviewers who have made the publication of this sixth issue possible and wish you all an inspiring dive into this new collection of articles.

[3] Chuliá Blanco I., et al., "Rescue of movable assets and damage assessment after the 2024 floods in the Valencian Community- part 1" in *PROCULTHER-NET Project 2. Technical Bulletin N. 5, July 2025*, pp. 42-53. ISSN2975-190X- ISBN 978-88-6864-548-9 [***https://civil-protection-knowledge-network.europa.eu/media/rescue-movable-assets-and-damage-assessment-after-2024-floods-valencian-community-part-1***] Accessed 22 October 2025.

Protecting Ukraine's cultural heritage in times of conflict: ALIPH's Action Plan (2022-2025)

Alexandra Fiebig, Project Manager, International alliance for the protection of heritage (ALIPH), Switzerland

Introduction

Since February 2022 cultural heritage across Ukraine has faced unprecedented threats due to the ongoing war, affecting museums, libraries, archives, monuments, and historic urban centres at risk of damage or destruction from military action. The International alliance for the protection of heritage (ALIPH), a global fund dedicated to safeguarding cultural heritage in conflict and crisis contexts, responded within days by launching a comprehensive Action Plan for the Protection of Cultural Heritage in Ukraine.

This article presents the main results sprung from the ALIPH initiative in Ukraine since 2022, showing how emergency measures have been combined with medium-term institutional building, examining diverse partnerships that contributed to the impact of the Action Plan. It also reflects on practical insights for the protection of cultural heritage in conflict situations.

1. Red Chamber, Khanenko Museum © Yurii Stefanyak

Rapid mobilization and emergency response

The ALIPH's Foundation Board approved in March 2022 an overall envelope of USD 5 million to finance emergency measures in Ukraine. This allocation was reinforced through generous contributions from the European Union (Foreign Policy Instruments), the Getty Foundation, the Principality of Monaco, the U.S. State Department. ALIPH adopts dedicated Action Plans whenever there is a need for an expanded and coordinated set of heritage protection measures in any area in need of urgent intervention, in response to a particular crisis. It entails an available envelope approved by the Foundation Board and short pre-determined decision circuits (mainly through electronic consultation of ALIPH's Chairs of the governing bodies), readily available within 24h to 48h.

The guiding principles were speed and concrete protection measures. ALIPH worked hand-in-hand with Ukrainian authorities, local civil society and other international heritage organizations to identify urgent needs. ALIPH's precise mission, the short decision-making circuits under the ALIPH Action Plan mechanism, allowed grants in case of urgent need to be allocated and issued within a day or two when needed.

"*The speed and efficiency are remarkable – after a shelling while we are still figuring out what to do, ALIPH is already reaching out with concrete plans.*" (Project beneficiary, evaluation interview)

2. Cultural assets retrieval from the Museum of Fine Arts in Odesa, Ukraine 2024
© Museum for Change

The support focused on three priority areas:

1. Protection of collections of museums, libraries, and archives – Support to emergency inventories, packing materials, storage and fire protection equipment, and dehumidifiers; reinforcement of windows and doors; and delivery of power stations (including solar-equipped units) to ensure climate control and security systems amid energy shortages.
2. Protection and stabilization of sites and monuments – Satellite and 3D documentation of at-risk monuments, emergency stabilization of damaged sites, and protective measures for historic buildings housing cultural institutions.
3. Support to heritage professionals – Direct financial support to ensure staff could continue working and meet basic needs, despite drastic salary cuts or human resource losses, alongside fellowship and training opportunities.

Main results (2022-2025)

The rolling funding opportunities were announced widely on ALIPH's and other social media channels, but more than anything else, actual 'word of mouth' played a crucial role due to the close connections within the Ukrainian heritage sector and the difficult war circumstances where trust is of utmost importance. The selection was first and foremost based on an evaluation of the degree of urgency and fea-

3. Protective measures for the Museum of Fine Arts in Odesa, Ukraine 2024
© Museum for Change

sibility in the war context as well as a solid track record of the granting institution examined through rapid due diligence audit.

The collections of over 350 museums, archives, and libraries were safeguarded through tailor-made support, which included the upgrade or creation of adequate storage conditions for evacuated collections in 14 important storage facilities in central and western Ukraine.

Within the first months of the Action Plan, ALIPH supported the National Research and Restoration Centre (NRRC) to create two heritage ambulances: vehicles equipped with mobile laboratories ("Heritage Ambulances"), conservation equipment, and materials to stabilize *in-situ* or relocate artifacts damaged or threatened by military action. These units became a cornerstone of the emergency response, traveling across the country to safeguard endangered collections whenever security situations allowed. The size of the NRRC teams varied between four to fifteen depending on the complexity of the collections to be safeguarded. If authorized by security, the teams would stay several days up to two weeks in site. Other interventions had to be limited to one day. Overall, more than 120,000 km have been travelled and over 350 collections and more than 18,000 artifacts benefitted from the conservation interventions already.

Over the past three years six major stabilization interventions were undertaken at sites and historic buildings directly damaged due to the war, these include interventions in the historic centre of Odesa repeatedly suffering from military action, such as the Odesa Fine Arts Museum, as well as historic buildings in Kharkiv such as the Research Institute of Venereology building. As a preventive measure, 120 historic buildings and sites were documented through 3D scanning and photogrammetry, throughout Ukraine including in front-line areas.

As per the most vulnerable areas subject to repeated military attacks, specific emergency funds were established. For example, an emergency fund for the Odesa region including its historic centre was established with the trusted partner the NGO "Museum for Change" which worked closely together with the local heritage department, to rapidly identify and implement needed emergency measures, namely the installation of OSB shields, protective films, and other urgent repair and stabilization works that were successfully implemented by the NGO together with local teams for the Philharmonic, the Literature Museum, the Western and Eastern Art Museum, the Regional Odesa State Archives, and the historic building of the Bank Porto-Franco, owned by the municipality and many others.

As of September 2025, ALIPH has supported 239 projects for an overall committed budget of nearly 8 million USD. Of these, 218 projects are completed, reaching more than 500 cultural heritage institutions across Ukraine. Such scale and regularity were possible thanks to the mobilization of a dedicated Ukraine team of five pro-

fessionals, including two native speakers who actively reached out to the Ukrainian heritage sector, and the additional contributions from major donors such as the European Union and the Getty Foundation.

Cross-sectoral cooperation

The effectiveness of the ALIPH Ukraine Action Plan was based on strong collaboration across national, local, and international actors. ALIPH worked closely with the Ministry of Culture and Strategic Communications, the National Research and Restoration Centre, and the State Archival Service. Partnerships with civil society such as the NGO's Museum for Change, and Heritage Rescue Emergency Initiative were essential and allowed for 24-48 hours responses in emergencies, while international cooperation with Europa Nostra, International Council of Archives, Cultural Emergency Response, Ukraine Art Aid Centre as well as UNESCO ensured alignment with other protection initiatives. At first weekly, then bi-weekly and since early 2024, monthly video calls were organized by the ALIPH Ukraine team for partners to update each other on their work. ALIPH's convening role was consistently recognized by partners:

"*ALIPH did an excellent job in effectively initiating and leading coordination meetings among national and international partners, donors, and stakeholders*." (Stakeholder feedback, 2025 evaluation)

In addition, ALIPH continued to participate in various other more thematic coordination mechanism such as meetings among libraries and archives or city conservators, convened by Polish and other European partners, as well as other international conferences dedicated to the preservation of culture and cultural heritage in Ukraine to continue raise awareness at national and international levels.

Multi-risk and innovative approaches

Although the primary risk was armed conflict, ALIPH's interventions also addressed cascading hazards such as energy shortages, fire, and water damage. Generators and solar power stations ensured continuity of climate control and security systems, while fire extinguishers and fireproof blankets reduced risks from bombing-induced fires.

Innovation was central. The deployment of heritage ambulances represented a new operational model for emergency conservation in warzones. Similarly, the systematic use of 3D documentation with a strong conservation lens, ensuring that outputs are useful to architect restorers in the future, provides a long-term digital safeguard to also facilitate future restoration.

Exploring innovative preventive measures such as the application of protective shatterproof films in cultural institutions' glass windows has an impact on daily life in Ukraine by mitigating breakage risks:

"*Thanks to preventive protection measures provided, we are not anymore under threats from shock waves. The National Library of Ukraine for Children became a social space where people can spend time meaningfully, reading the books.*" (National Library of Ukraine for Children, evaluation interview).

Impact, sustainability, and knowledge transfer

By September 2025, hundreds of thousands of artifacts had been preserved, hundreds of institutions supported, and more than 800 professionals enabled to continue their mission, out of which more than 75% consisting of women professionals. It is essential to support local heritage expertise during war time and to ensure that the

4. 3D documentation and digitization of cultural heritage © Skeiron

appropriate expertise is included in any of the ALIPH-funded interventions. Beyond numbers, ALIPH's work has given cultural actors a sense of international solidarity and hope.

Although many initiatives were short-term actions, sustainability was built through reinforcing Ukrainian institutions' capacities by providing both the equipment and training needed, also supporting professional networks. Some civil society actors became strategic implementing partners on the ground, ALIPH supported the growth of these NGO's by also providing essential administrative support to ensure strong financial management. The lessons learned - rapid mobilization, cross-sectoral coordination, integration of heritage into emergency planning, and deployment of mobile conservation units to provide expertise where it is most needed - could be replicable in other contexts of conflict or crisis.

Conclusion

Since 2022, ALIPH's Action Plan in Ukraine has demonstrated that protecting cultural heritage during armed conflict is possible, impactful, and essential. The experience highlights that emergency aid can, and should, be combined with preparedness and capacity-building, ensuring that cultural heritage can play a key role in sustaining cultural professionals and communities.

As one Odesa official underlined:

"*The collaboration between ALIPH, the Odesa regional authorities, and Museum for Change represents not only the protection of heritage, but also a form of psychological rehabilitation for our citizens – it is nothing short of salvation*." (Representative of Odesa Municipality, evaluation interview)

The Ukrainian experience shows that, even in difficult circumstances, cultural heritage can be safeguarded through the combination of local leadership, international cooperation, and practical innovation. This approach provides useful lessons for protecting heritage in future crisis situations globally.

The role of the Carabinieri for the protection of cultural heritage in crisis areas: experiences in Kosovo and Iraq

Lt. Col. Lanfranco Disibio, Head of Operations and Logistics, Carabinieri Command for the Protection of Cultural Heritage, Italy

Introduction

The protection of cultural heritage in crisis areas is a complex challenge that requires specialized skills, advanced technological tools and international cooperation. The Carabinieri Command for the Protection of Cultural Heritage (TPC), established in 1969 as the first unit in the world within an armed force dedicated specifically to the protection of cultural heritage, has developed a globally recognized operating model.[1]

In summary form, this article illustrates the main experiences gained by the TPC in Kosovo and Iraq since 2002, highlighting their operational results, capacity building strategies and subsequent development in the framework of the "Blue Helmets of Culture" and European missions.

The TPC Command: skills and tools

The TPC is structured as a specialized department of the Carabinieri, placed under the functional responsability of the Ministry of Culture. It is composed of Carabinieri officers, not art experts, as many are often led to believe. In carrying out their duties, the members of this specialized unit are required to apply their law enforcement and judicial police skills to the protection of cultural heritage, with the aim of preventing and countering the illicit trafficking of cultural heritage both in Italy and abroad.

For this reason, TPC personnel is preferably selected from territorial commands and other investigative units of the Carabinieri Corps, appointing officers who have already developed, over a sufficient period of service, the mindset and fundamental investigative techniques that can then be enhanced through specific specialization and qualification courses, thus forming the so-called "art investigators".

The added value of this model lies in the Italian paradigm of protection, based on an integrated and complementary system that ensures daily cooperation between the TPC units, devoted to criminal investigation, and the experts of the central and peripheral offices of the Ministry, dedicated to the historical and scientific study of cultural heritage.

[1] Its establishment preceded by one year the UNESCO General Conference held in Paris from 12 October to 14 November 1970, during which, at its sixteenth session, Member States were invited to create within their own administrations a dedicated "Service" exclusively responsible for the protection and safeguarding of cultural heritage.

The Command, which today counts approximately 300 officers specialized in the field, is headquartered in Rome and includes an Operational Unit divided into four sections: Archaeology, Antiquities, Counterfeiting and Contemporary Art, and Cyber Investigation.

It also comprises two Groups, based in Rome and Monza, responsible for directing, coordinating, and supervising sixteen regional or interregional Units distributed across the national territory, as well as a Section located in Syracuse, Sicily.

The main tasks of the Command can be summarized as follows:

- prevention of crimes against cultural heritage;
- specialized law enforcement and investigative activities;
- retrieval of stolen cultural heritage assets;
- management of the Database of Stolen Cultural Heritage;
- safeguarding of cultural heritage in situations of crisis and emergency and, since 2016, participation as a component of the Italian "Blue Helmets for Culture" Task Force.

Of utmost importance to cultural heritage protection activities is the ability to identify all the artworks to be retrieved. In this regard, the TPC Command represents a world-class excellence thanks to its "Database of Illegally Removed Cultural Heritage". Managed by a dedicated Section, it is the largest database in the world of stolen works of art, containing information on more than 1,300,000 objects to be retrieved. This database is integrated with the "Leonardo" information system of the TPC Command, developed for the management and storage of all preventive and enforcement activities, such as photographic surveys, inspections of archaeological sites, illicit export controls, and checks on monumental areas.

Leonardo is a flexible digital tool that allows for the global search and identification of stolen cultural objects through its integration with SWOADS (Stolen Works Of Art Detection System)[2], a dedicated crawler tool capable of identifying stolen objects on the web and social media thanks image recognition and with the support of artificial intelligence. When a potential match is detected, operators are alerted and can notify the relevant national authorities, activating international cooperation channels to recover the item.

This technological capability is not limited to Italian cases. The system supports partner countries upon request, allowing their stolen items to be entered into the searchable pool. It is already being used successfully for Iraq, and it is available to other countries, who are in crisis situations, demonstrating the scalability and shared value of the model. The combination of field experience, institutional cooperation, and advanced technological tools illustrates how a practical, adaptable system for

[2] SWOADS - Stolen Works of Art Detection System Web site ***https://tpcweb.carabinieri.it/SitoPubblico/home/informazioni/swoads***

cultural heritage protection can produce concrete results across different operational contexts.

Kosovo 2002-2003

The very first engagement of the TPC abroad happened as part of the NATO mission K-FOR "Joint Guardian"[3]: from 2002 to 2003 an Officer of the TPC worked in Kosovo with the task of monitoring and documenting cultural sites at risk. The activity involved the collection of photographs and videos of the assets, which were subsequently included in the national database, as well as cooperation with local authorities and Kosovar academia, and in case of religious items, the local religious authorities. This synergy has made it possible to facilitate the intervention of the Italian Central Institute for Restoration on damaged monuments, contributing to a broader strategy of post-conflict reconstruction. This experience demonstrated that the presence of armed forces units specialized in cultural heritage protection, unlike purely military contingents, could actively contribute to the process of cultural reconciliation, anticipating the concept of *heritage diplomacy* now promoted by UNESCO.

Iraq 2003-2006: field operations

After the 2003 war events, the TPC was employed in the "Ancient Babylon" operation in Nassiriya and at the Baghdad Archaeological Museum. In the province of Dhi Qar, the Carabinieri surveyed 621 archaeological sites, conducted 25 aerial recon-

1. A moment of the training © Carabinieri - TPC

[3] ***https://www.nato.int/en/what-we-do/operations-and-missions/natos-role-in-kosovo?selectedLocale=on.*** Accessed 16 October 2025.

naissances, seized over 1600 stolen artefacts and arrested 53 suspects involved in clandestine excavations. At the same time, a detailed archaeological map of the province was created, including 14 types of maps with information on extension, chronology, state of conservation and level of risk. At the Baghdad Museum, two TPC officers acted as "advisors" to the Iraqi provisional government, cataloguing over 3000 looted artefacts and training Iraqi officials in the cataloguing and identification of artefacts. The data were transmitted to Interpol and UNESCO, favouring the international dissemination of information useful for retrieval. To facilitate cataloguing procedures, the "Object ID" standard was adopted, in compliance with UNESCO guidelines.[4] This cultural and diplomatic cooperation, made possible by the institutional nature of the TPC Command, made Italy the only foreign actor authorized to manage sensitive data concerning the country's archaeological heritage.

Alongside the operational activities, the TPC promoted international meetings with Interpol and UNESCO to develop strategies to combat illicit trafficking. Training courses were organized for the Archaeological Special Protection (ASP) and the Facility Protection Service (FPS), training hundreds of Iraqi units. The training covered both basic military techniques and methodologies for cataloguing, recognizing and transporting finds.

From the crisis to the Blue Helmets of Culture

The spotlight of the international community has been rekindled with particular focus on the issue of the protection of cultural heritage, starting in 2013 when, in the Middle East, jihadist terrorism treacherously attacked thousand-year-old cultural sites that belonged to the ancient civilizations that flourished in the so-called fertile crescent, annihilating for ideological, economic and propaganda purposes works of art, monuments and artefacts that had resisted time, to illegal trade, to the destruction by wars, to the passage of armies and to the negligent care. The action of ISIS/DAESH, in addition to the endemic looting activity of that region, has extended to the illicit trafficking of important and valuable cultural assets, using those profits to finance the related terrorist activities.

On February 12th, 2015, with the historic Resolution 2199, in recognizing and condemning these events, the United Nations Security Council appealed to Member States and other international organizations to adopt the necessary measures to counter and prevent these phenomena, thus setting in motion to the global coalition called "Unite4Heritage"[5] promoted by UNESCO.

The experiences gained in Kosovo and Iraq laid the foundations, in 2016, for the creation of the "Unite4Heritage" Task Force, later called "Blue Helmets of Culture" composed of specialized soldiers of the TPC and selected experts from the Italian

[4] See: ***https://icom.museum/wp-content/uploads/2020/12/ObjectID_english.pdf***. Accessed 16 October 2025.

[5] ***https://www.unesco.org/archives/multimedia/document-4417***. Accessed 16 October 2025.

Ministry of Culture, specialists in the fields of archaeology, art history, and conservation. On February 16th, 2016, the ITALY-UNESCO Memorandum of Understanding was signed in Rome aimed at establishing the Italian Unite4Heritage Task Force formed by the two different components, civil and military.[6]

In this context, UNESCO has requested the Italian Government to activate the "Unite-4Heritage" partnership in Iraq as part of the initiatives for the protection of the Iraqi heritage of Nimrud, freed from the presence of Daesh in November 2016. In February 2017, the UNESCO Office for Iraq and the Carabinieri Command for the Protection of Cultural Heritage began collaborating to launch training courses for local armed forces and officials on preventing and combating the illicit trafficking of archaeological artefacts.

From the beginning of 2018 to December 2019 in Baghdad and Erbil, on site security by the presence of two Carabinieri Command for the Protection of Cultural Heritage belonging to the Task Force, was ensured as part of the "Inherent Resolve/Prima Parthica" mission. In this context, 38 courses in "Cultural Heritage Protection" were carried out in favour of units of the Ministry of the Interior, the Ministry of Culture and Antiquities and Iraqi Customs, training over 1000 units.

2. Training at the Museum of the Salahaddin University, Erbil © PI SMD

[6] From a conceptual and organizational point of view, the two teams (teams from Ministry of Culture and the Carabinieri - TPC) replicated, on emergency scenarios and international crises, the Italian protection scheme which is based on an integrated and complementary system of daily collaboration between the soldiers of the TPC Command, devoted to criminal investigation, and the experts of the central and peripheral offices of the Ministry of Culture, dedicated to the historical and scientific research on cultural heritage.

At the same time, since 2019, the Carabinieri TPC have been participating in the EUAM[7] Iraq mission as strategic advisors for the protection of cultural heritage.[8] In this context, the "Pilot National Database for Cultural Heritage Protection" project was developed, which provided the Iraqi authorities with an integrated platform for cataloguing and investigative analysis of stolen goods.[9]

Results and achievements of the Carabinieri TPC Command's operations in Iraq and Kosovo

The commitment of the Carabinieri TPC Command in Kosovo and Iraq represented a turning point in the protection of cultural heritage in crisis scenarios. It represented a concrete and measurable step toward developing an operational model for cultural heritage protection in crisis and post-conflict contexts. What emerged from these experiences is not an abstract concept but a tested set of practices and procedures that, once adapted to different environments and institutional settings, have proven to be effective and replicable.

In both missions, the approach was based on a few essential elements: a clear understanding of the strategic relevance of cultural heritage in conflict dynamics; the practical ability to conduct CHP tasks directly in the field; the integration of law enforcement expertise with sector-specific knowledge; and the establishment of cooperation channels among actors who traditionally operate in separate domains, such as police, military, local heritage authorities, religious institutions, and international organisations. These elements produced tangible and lasting results. In Iraq, in particular, objects looted or stolen during instability were identified and, in several cases, traced and retrieved. Archaeological and cultural sites were documented and placed under regular monitoring, while local professionals received training to support protection activities after the end of international missions. Most importantly, these operations proved that cultural heritage protection can be systematically integrated into broader international missions without interfering with their primary mandates. indeed, contributing to stabilisation, governance, and community resilience.

The strength of this model lies in its flexibility. It is not a rigid framework but a methodology adaptable to different institutional realities and security environments. Whether operating in contexts where heritage authorities operate or in situations of institutional collapse, the approach allows for gradual implementation: beginning with monitoring and data collection, moving to inventory and risk assessment, and eventually advancing toward coordinated enforcement and international cooperation.

[7] European Union Advisory Mission in Iraq: ***https://www.euam-iraq.eu/en***. Accessed 16 October 2025.
[8] Senior Strategic Advisor Organized Crime – Cultural Heritage Protection.
[9] Funded by Germany and drawing on the expertise of the TPC Command, the project, implemented under the aegis of EUAM, aimed to develop both the physical infrastructure and the software for a database of cultural heritage illegally stolen in Iraq, to be used by the Federal Intelligence and Investigation Agency (FIIA) of the Ministry of Interior and by the State Board of Heritage and Antiquities (SBHA) of the Ministry of Culture, Antiquities and Tourism..

This adaptability makes the model replicable. Over time, its core components (inter-agency coordination, local capacity-building, and the integration of cultural heritage protection within broader security and development agendas) have been adopted by diverse institutions and stakeholders around the world.

International and regional organisations, including UNESCO and the European Union, increasingly recognise that cultural heritage protection plays a strategic role in peace, security, and stabilization, an understanding largely informed by the early, field-tested experience of the Carabinieri.

Current activities of the Carabinieri TPC Command

In 2024, the Carabinieri Command for the Protection of Cultural Heritage completed the repatriation of works of extraordinary value, along with thousands of archaeological artefacts originating from illicit trafficking, including from the Middle East.

These operations are often the result of joint investigations conducted with the FBI, Homeland Security Investigations, and European police forces coordinated by Europol and Interpol.

Since April 2025, the TPC advisor has promoted bimonthly round tables with the aim of improving initiatives for the defence of cultural heritage, in which the heads of the EUAM mission and all the counterparts of the Middle Eastern country who work in the protection of cultural heritage are called to participate.

Among the topics covered are the intention to:

- facilitate the exchange of information relating to investigative activities;
- create a specialized unit for activities abroad and the return of stolen works;
- increase efforts for a widespread cataloguing of cultural heritage;
- implement the database of stolen works of art with the available data;
- create a national strategy for the protection of cultural heritage by also promoting study visits to Italy.

Conclusion

Ultimately, the experience shows that protecting cultural heritage is not only a moral obligation or a technical field of expertise, but an effective, scalable instrument to support crisis management and international cooperation. It strengthens rule of law, supports local ownership, and reduces the illicit trafficking that fuels organised crime and extremism. The TPC approach remains valuable not because it is bound to a single national tradition, but because it actually works, adapts to multiple contexts, and continues to inform and inspire international practice in the protection of cultural heritage.

Fire safety in historic wooden buildings: Poland's experience

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Introduction

Old wooden cottages, many of which can still be found spread across Poland (such as the remains of the settlement in Biskupin from 738 B.C., or wooden churches from the 14th century), are particularly vulnerable to fire hazards. These cottages are a testament to ancient building traditions and the lifestyle of rural Poland. Such houses, often with thatched or shingled roofs, are captivating in their simplicity and natural beauty. Many are state-owned and listed in the register of historical monuments. In some regions, particularly Podhale, Subcarpathia, Podlasie, Mazovia, and Lesser Poland, entire villages with traditional wooden buildings have survived.

1. An example of Polish folk architecture: the Saints Odile and Lucy chapel in Wilków © Jacek Smyczynski

To preserve these exceptional examples of folk architecture, many open-air museums have been established in Poland, among them: the Museum of Folk Architecture in Sanok – the largest in Poland, the Ethnographic Park in Tokarnia (the Kielce Village Museum), the Upper Silesian Ethnographic Park in Chorzów, the Kashubian Ethnographic Park in Wdzydze Kiszewskie, the Museum of the Masovian Village in Sierpc, the Lublin Village Museum in Lublin and the Wielkopolska Ethnographic Park in Dziekanowice. Open-air museums feature not only wooden cottages but also barns, windmills, chapels, and other farm buildings for visitors to enjoy. These museums offer insights from the past rural life (mainly from the 14th century), showing how people lived, what they did, and what their customs were. Today, open-air museums play an important role in preserving cultural heritage and remind us of Poland's rich rural traditions and history. Many of them are architectural gems, valuable relics of old Polish architecture. Their historic furnishings also add value. This makes them even more important to care for and protect against various threats, including fire.

"Polish law does not provide for specific fire protection regulations pertaining to historic buildings, that differ from those for other buildings".[1] To prevent fire hazards in historic buildings with wooden structures, regulations established by local law, standards, and norms, as well as good engineering practices and knowledge, are applied.

Potential threats

Historic wooden cottages and other wood constructed buildings, despite their charm and natural character, are unfortunately exposed to severe fire hazard. Wood, being a combustible material, ignites quickly and can contribute to the rapid spread of fire. In the past, in cottages with thatched or shingled roofs, the use of wood-burning stoves further increased the risk of fire. All it took was a spark from the chimney, careless handling of fire, or a lightning strike to set the entire building ablaze. For example, on July 2, 1994, a huge fire broke out in the Museum of Folk Architecture in Sanok, which destroyed a large part of the open-air museum, destroying priceless monuments and fragments of the past.

In an era of increasingly frequent climate crises and natural disasters, wooden buildings are particularly vulnerable to destruction. Climate change is leading to an increase in extreme weather events - such as windstorms, violent storms, heavy rainfall, torrential rain, floods, flooding, and droughts - which pose a serious threat to traditional wooden structures. Although wood is an ecological and environmentally friendly material, it is susceptible to moisture, fire, and pests, which can lead to its rapid degradation in crisis conditions. During prolonged periods of drought, the risk of fires increases,

[1] Kociołek K. T., "Fire protection of buildings and collections" in *Protection of cultural property in crisis situations and armed conflicts. Volume I*, Scientific Editors Góralczyk K., Szuniewicz-Stępień M., Naval Academy named after the Heroes of Westerplatte in Gdynia, 2022. ISBN 978-83-963739-9-1. (in Polish only)

and these fires can quickly engulf entire wooden buildings. Intense rainfall and flooding, in turn, weaken foundations and wall structures, causing deformation and rot.

Given the changes observed, it is essential to implement adaptation strategies encompassing both technical and planning measures.

Basic elements of prevention and protection

Today, wood is making a comeback and is increasingly used in construction. Fire safety requirements for buildings and other structures, including wooden structures, are contained in national laws. The obligation to comply with them and protect buildings, and especially their occupants, from threats rests with their owners, managers, or users. Monitoring compliance with these requirements is one of the responsibilities of the State Fire Service and construction supervision authorities.

Various protective measures are used to protect wooden structures from fire. Basic preventive measures include the use of modern fireproofing and water-repellent impregnations, ensuring proper ventilation and thermal insulation, and designing stormwater drainage systems. Furthermore, it is advisable for owners and managers to conduct systematic research on the durability of wooden structures in changing climatic conditions and develop guidelines for the conservation and modernization of historically significant buildings, in close collaboration with art historians, conservators, and structural engineers. Collaboration with specialists in fire safety, structural safety, and material durability is also crucial in this regard. A comprehensive approach to the problem will help reduce material and cultural losses resulting from increasingly frequent environmental crises.

Modern fire-retardant impregnations reduce the flammability of wood, and fire protection systems, such as smoke detection systems and fixed fire extinguishing equipment, allow for a quick response to threats and limit the spread of fire. However, it is not always possible to apply this type of protective measures, due to conservation principles which include, above all, the principle of preserving authenticity.[2] This must be done in close cooperation with monument conservators.

When analysing the fire hazard in wooden buildings, special attention should be paid to **chimneys**, ensuring that their construction is not directly adjacent to wooden structures. The narrowness of the chimney pipes from the stove to the roof outlet should also be checked, with particular attention to the attic area. Chimneys in wooden buildings are generally masonry structures, often extended with steel or stoneware elements. These no longer meet modern standards and have lost their former efficiency. They may have leaks and defects. Despite this, they are still used. Polish

[2] The principle of preserving authenticity includes: preserving the original wood structure; only those elements that cannot be repaired are replaced; using materials identical or very close to the original (wood species, processing technique, joining method); avoiding modern substitutes (e.g., glued laminated timber, plywood, OSB boards) in visible and load-bearing areas.

2. Smoke detectors (above) and an unsecured lamp on the wooden ceiling of a larch church (below) © Krzysztof T. Kociołek

law requires periodic annual chimney inspections, but unfortunately, owners often forget about this, and the accumulated soot in the chimney can ignite, generating very high temperatures that can crack the chimney wall. A solution seems to be the introduction of mandatory annual building inspections for historic wooden buildings and the prohibition of granting funds (national and international) for conservation work in the event of non-compliance with periodic building inspection requirements.

Another fire hazard is caused by **electrical equipment** and installations. In old wooden houses, underground electrical connections are very rare: unprotected overhead wire connections are most common, swaying in the wind between a power pole and a roof rack, and less often on the wall. Polish law also requires periodic five-year or annual inspections of **electrical installations**. Contemporary threats resulting from the risk of voltage instability in the power grid are related not only to the risk of blackout, but also to the risk of connecting prosumers producing electricity from renewable energy sources to the power grid, also causing visible voltage fluctuations in the grid in the event of changes in sunlight and wind force.

Uncontrolled vegetation around wooden buildings also poses a significant fire hazard. Certain plant species, particularly resinous conifers or those producing essential oils, ignite easily and can accelerate fire spread, especially during drought or high temperatures. To reduce risk, it is essential to select suitable plant types, maintain clear firebreaks such as stone or paved paths, and regularly remove flammable debris like leaves, branches, and dry grass. Vegetation near structures can propagate fire through direct contact, heat radiation, or wind-borne embers, all of which can quickly endanger wooden buildings if proper maintenance is neglected.

In historic wooden houses, old gas installations often pose a serious threat to safety. Steel pipes, frequently bolted instead of welded, can leak and cause fires or explosions, while inadequate ventilation increases the danger. Limited awareness of gas safety regulations and unauthorized do-it-yourself repairs further worsen the situation. Regular joint inspections by fire services, building authorities, and heritage conservation offices are essential to prevent accidents and ensure compliance with safety standards.[3]

Although plumbing does not directly cause fires, failures can seriously damage wooden structures and indirectly increase fire risk. Water leaks may lead to wood decay, moisture, and corrosion in electrical systems, causing short circuits or overheating. To prevent such hazards, roofs and gutters must be properly maintained and protected from leaks, while plumbing systems, especially in unoccupied houses during winter, should be secured against freezing and moisture infiltration.

It's also important to remember the fire hazards associated with rodents, which can cause short circuits by chewing through the insulation of electrical wires, and by chewing through the rubber hoses connecting LPG cylinders to the gas appliance, they can cause uncontrolled gas leaks, potentially resulting in an explosion or fire.

During lightning storms, lightning striking vegetation or buildings themselves is an additional fire-initiating factor. Combined with strong winds, this significantly accelerates fire spread. This phenomenon is particularly dangerous in densely built-up areas with a large proportion of green spaces.

How to ensure efficient response measures

Collaboration with local government representatives, particularly representatives of local fire protection units, through periodic audits, risk analysis, preparation for potential crises through the development of action plans, securing firefighting resources (especially adequate water supplies), and ensuring access to the fire service is fundamental to guarantee an adequate level of safety.[4] As already mentioned, the

[3] The only way to improve this situation is to carry out more frequent, periodic (e.g. annual) joint inspections of wooden historic buildings by the State Fire Service, building supervision authorities and representatives of monument conservation offices.

[4] Considering the safety of a historic cottage, we must not forget the obligation to ensure the safety and evacuation of its occupants. Adequate width, height, and length of emergency exits are a priority, but providing adequate enclosure and separation of escape routes may be problematic

responsibility for protection against fires and other threats lies with those managing historic buildings, but practice shows that the actions of non-governmental organizations and social conservators of monuments, as well as the increasing media interest – especially after spectacular fires of wooden monuments, thefts, flooding and other damages - are very helpful.[5]

As mentioned above, ensuring adequate access for emergency services (fire routes) and the appropriate type and quantity of extinguishing agents (primarily water from fire hydrants or fire water tanks) also affects the timeline of fire development in a wooden house. Preparing a wooden house for fire operations includes ensuring optimal access for emergency services to the threatened structure and water for firefighting purposes.

Collaboration among different actors for effective prevention plans

Effective protection and adaptation of wooden houses to contemporary environmental threats requires an integrated approach and close collaboration among multiple stakeholders. Due to the complex and multifaceted nature of this problem - involving technical, legal, social, environmental, and cultural issues - it is essential to create cross-sector partnerships that combine various levels of governance and specialist competencies. In this context, local government units play a key role (government in the field of supervision and enforcement of legal requirements, and specialists in the field of developing security concepts), responsible for spatial planning, developing local climate change adaptation strategies, and implementing support programs for owners of historic wooden buildings.

Voivodeship, municipal, and local conservators also play a crucial role, overseeing conservation and renovation processes, ensuring compliance with applicable cul-

due to the flammable building materials used years ago to construct wooden cottages. Ensuring the occupants' quick and safe exit of the building is a priority. "Pursuant to the regulation of the Ministry of Infrastructure and Construction of 12 April 2002 (Journal of Laws 2022, item 1225, as amended), building plots, buildings and related facilities must be accessible and also grant access to a public road, appropriate to their intended use and to the fire protection requirements specified in separate regulations (Kociołek 2024)". The adequate level of safety is intended to be the one meeting legal requirements. Higher level of security could be defined by insurers.

[5] The Museum of Papermaking in Duszniki-Zdrój was damaged by the flood in 1997; the latest ones include Nowa Biała in Spisz – part of the village was destroyed by a fire in 2021, which affected over 40 buildings, including many historic houses and farm buildings; in 2023, a wooden villa in Zakopane "Doctor's House", which housed a private art gallery, burned down; in 2024, a fire destroyed the Stolberg Palace in Wrocław; in 2025, a flood destroyed many wooden monuments in Lower Silesia; in 2025, a fire destroyed the roof of the manor house in Wilkiszki, after which fire safety inspections were intensified, and owners and state institutions analyzed the possibility of applying additional security measures. Unfortunately, there are no current statistics on threats and damage to wooden monuments. Assessments of the state of preservation and analysis of protection are primarily handled by the National Heritage Institute, the Ministry of Culture and National Heritage, and the Voivodeship Offices for the Protection of Monuments.

3. Fire in a historic house in Zakrzów, December 2023 © Niepołomice Volunteer Fire Department

tural heritage protection standards. The State Fire Service participates in threat analysis and develops threat catalogues - specifically, risk maps - and conducts inspections, reconnaissance, and exercises, including at historic buildings. Exercises conducted by the State Fire Service, in collaboration with managers of historic buildings, other uniformed services, and local authorities, allow for the verification and refinement of historic building protection plans, procedures, and safety assumptions.

Collaboration with research centres and institutes that develop modern technological solutions is also particularly important in this process (for example, cooperation and implementation of grants with the Scientific and Research Centre for Fire Protection - National Research Institute). Additional support can be provided by non-governmental organizations de (including the Association of Monument Conservators, Krakow Branch, the Social Committee for the Restoration of Krakow Monuments) dedicated to the protection of cultural heritage or regional foundations that implement educational, documentation, and conservation projects. Research projects on monument protection are currently or have been conducted, funded by, among others, the Ministry of Culture and National Heritage, the National Centre for Research and Development, the Government Program for the Reconstruction of Monuments, and "Protection of Monuments" competitions organized by the

Marshal's Offices of individual voivodeships. One example is the OZAB project[6] an innovative, ICT-based system supporting safety management in the context of improving the safety of historic building complexes.

An example of good practice is the implementation of an integrated risk management (IRM) model, in which individual stakeholders exchange data, create joint crisis response plans, and develop scenarios for natural disasters. This comprehensive and multi-agency approach promotes not only increased resilience of wooden buildings to threats but also the long-term preservation of the cultural and landscape values of rural areas. Developed under Polish law, monument protection plans (movable and immovable) for historic buildings are official planning documents that define methods for securing, evacuating, and rescuing historic buildings in the event of threats (e.g., fire, flood, theft, construction collapse, armed conflict, and others). These documents also describe potential threats to historic buildings, assess the needs for monument protection (material and financial), and designate the teams responsible for responding to threats. Developing and updating monument protection plans is the responsibility of the owner or manager of a historic building. An effective plan, developed by professional teams, also includes a risk analysis of crisis situations.

Furthermore, the Act on Civil Protection and Civil Defence, effective as of January 1, 2025, introduces an obligation to analyse collections to select cultural property for protection or evacuation for the purposes of carrying out wartime protection tasks. In the event of a crisis, collections must be analysed to select cultural property for protection or evacuation. The following criteria are considered when conducting this analysis:

1. the value of the collections – historical, scientific, and artistic value, national and global significance, as well as market value;
2. the rationality, cost-effectiveness, effectiveness, and feasibility of securing or evacuating the collections.

These regulations will enter into force in their respective areas on January 1, 2026, and January 1, 2027. Intensive training is currently underway for government and local government administration.

Another example is the annual "Well-Tended Monument" (Zabytek Zadbany) competition organized by the Minister of Culture and National Heritage and the General Conservator of Monuments. The aim of the competition is to promote the care of monuments, including the best practices in research, conservation, adaptation, maintenance, and development of monuments.[7] On behalf of the Minister of Culture and National Heri-

[6] More on OZAB project: ***http://dsc-vr.pl/project/projekt-ozab*** (Polish only).

[7] In 2025, the following were awarded in the competition: the peasant granary in Racibórz-Sudół, Silesian Voivodeship; the branch church of St. Sebastian in Kosin, Subcarpathian Voivodeship; the parish church of St. Mary the Immaculate Conception in Oporów, Greater Poland Voivodeship; the villa called the "Zośka" House in Piaseczno, Masovian Voivodeship; the tower – a drying room for fire hoses – in Przyrów, Silesian Voivodeship.

tage, the General Conservator of Monuments oversees the competition, while the National Heritage Institute is responsible for its implementation. The competition entries are evaluated by a jury appointed by the General Conservator of Monuments.

Conclusion

The preservation of vernacular heritage such as the historic Polish wooden cottages requires a comprehensive risk management approach, that encompasses awareness-raising, the large-scale implementation of basic prevention measures, scientific research, and a closer collaboration between the owners, managers, and experts of cultural heritage, the civil protection forces, and the civil authorities. Several projects involving multiple stakeholders are currently being carried out in Poland. The legislation regarding Civil Protection has been strengthened to better include cultural heritage in prevention, preparedness and response measures. In order to preserve Poland's wooden structure cultural heritage, it is essential that this approach is spread and implemented throughout the country.

SUMMARY OF RULES AND LAWS RELATED TO DISASTER RISK MANAGEMENT*

- Act of 24 August 1991 on fire protection (Journal of Laws of 2025, item 188). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU19910810351*
- Regulation of the Minister of Infrastructure of 12 April 2002 on the technical conditions to be met by buildings and their location (Journal of Laws 2022, item 1225, as amended). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20220001225*
- Regulation of the Minister of Internal Affairs and Administration of 24 July 2009 on fire water supply and fire routes (Journal of Laws of 2009, No. 124, item 1030). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20091241030*
- Regulation of the Minister of Internal Affairs and Administration of 7 June 2010 on fire protection of buildings, other construction works and areas (Journal of Laws of 2023, item 822, as amended.). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20230000822*
- Act of 5 December 2024 on Civil Protection and Civil Defense (Journal of Laws of 2024, item 1907). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20240001907*

SUMMARY OF RULES AND LAWS RELATED TO CULTURAL HERITAGE*

- Act of 23 July 2003 on the protection and care of monuments (Journal of Laws of 2024, item 1292). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20031621568*
- Regulation of the Minister of Culture of 25 August 2004 on the organization and method of protection of monuments in the event of armed conflict and crisis situations (Journal of Laws No. 212, item 2153). *https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20042122153*

** Polish only*

Strengthening the protection of cultural heritage at risk: building a culture of resilience

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Introduction

In the current context of climate crisis, cultural heritage is increasingly affected by extreme events such as storms, floods, submersions, etc. Its vulnerability is heightened by its intrinsic fragility[1] linked to its antiquity, often amplified by factors relating to shared governance around heritage and current political challenges. On one hand, in Europe, its evolution in the context of a global crisis adds complexity to its maintenance, preventive conservation and post-event reconstruction. On the other hand, in France, the composite legislative, regulatory and normative framework crosscuts cultural, environmental and crisis management policies.

In this context, the French Association for Disaster Risk Prevention - AFPCNT[2] and the Blue Shield France - BbF [3], both non-governmental organisations, in 2023 created a national working group on "Cultural Heritage and Major Risks". Its ambition is to increase the protection of cultural heritage at risk, by building a community, improving knowledge, risk management and preparedness before, during and after extreme events.

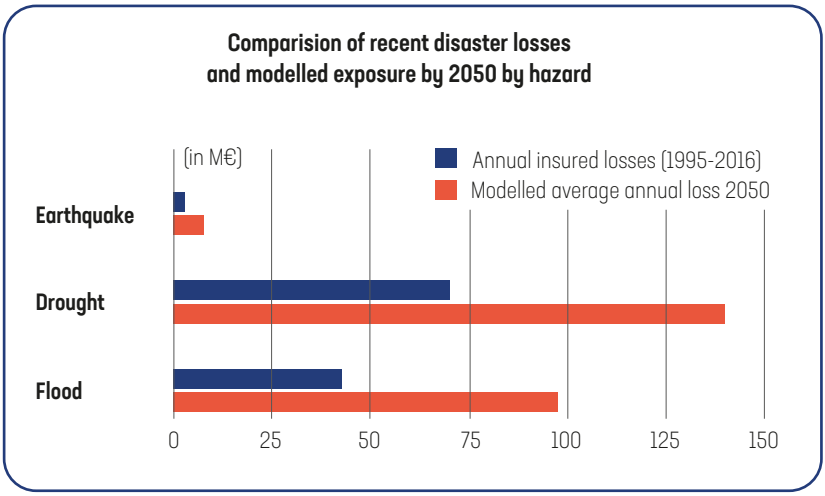
AFPCNT is playing a key role in France in fostering a culture of disaster prevention and resilience. This culture is intended to be inclusive, engaging all stakeholders through a global and multidisciplinary approach, covering prevention, information, protection, mitigation, crisis management, security and business continuity, recovery and Build Back Better, as well as encouraging the increase of adapted collective and individual behaviours in response to disaster risks. The association leads a large network of involved actors, at national (French metropolitan areas and Overseas territories)[4], European and international levels, to promote good practices and to enhance dialogue among these actors. The network is composed of various members representing civil society, from individuals to federations. It includes more than two hundred historians, architects, engineers (specialized in hydrogeology,

[1] Ministère de la Culture France, Bilan 2019- 2024 sur l'état de conservation des biens historiques immeubles en France, 19 mai 2025. [***https://www.culture.gouv.fr/thematiques/monuments-sites/ressources/les-bilans/bilan-2019-2024-de-l-etat-de-conservation-des-monuments-historiques-immeubles#:~:text=Plus%20de%2077%20%25%20des%20monuments,proportion%20similaire%20au%20pr%C3%A9c%C3%A9dent%20bilan***] Accessed 22 October 2025

[2] AFPCNT Website ***https://afpcnt.org/***

[3] Blue Shield France Website ***https://www.bouclier-bleu.fr/***

[4] For more information about examples of French continental area ***https://afpcnt.org/projet/experimentation-girondine/*** and overseas ***https://afpcnt.org/projet/gtom/.***



1. CCR - Caisse Centrale de Réassurance, prevention of natural disasters by the major natural risk prevention fund, elements of the draft regional climate and energy plan for the Île-de-France Region

seismology, meteorology, climatology, etc.), territorial agents and officers, sociologists, firemen and representatives from the economic, social, educational, and environmental sectors. These members share their expertise, experiences and good practices, working on a common language and on a composite body of knowledge dedicated to disaster risk reduction.

Cultural heritage at risk of disaster in France

To date, in France, over 1500 cultural institutions, 45070 Historical Monuments and more than 860 Outstanding Heritage Sites[5] are positioned in potential risk areas. Thus, creating an enormous challenge for politics and all stakeholders involved in dealing with this Heritage. In France, 30 % of the built environment is located in areas susceptible to flooding and half of continental France is vulnerable to the landslide risk due to shrinkage, increased swelling of clay, as well as other hazards, exacerbated by climate change.[6]

[5] Outstanding Heritage Sites or "Sites Patrimoniaux Remarquables" in France are "*towns, villages or districts whose conservation, restoration, rehabilitation or enhancement present a public interest from a historical, architectural, archaeological, artistic or landscape perspective*". Rural areas and landscapes that form a coherent ensemble with these towns, villages or districts or that are likely to contribute to their conservation or enhancement may be classified under the same designation. French Ministry of Culture [***https://www.culture.gouv.fr/fr/aides-demarches/protections-labels-et-appellations/protection-au-titre-des-sites-patrimoniaux-remarquables***]. Accessed 28 October 2025.

[6] Géorisques.gouv.fr, *Les risques naturels sur le territoire français : chiffres clés*. [***https://www.georisques.gouv.fr/minformer-sur-la-prevention-des-risques/les-risques-naturels-en-france-chiffres-cles***] Accessed 22 October 2025.

Moreover, in France a multi-layered network of actors from various sectors are involved in the protection of cultural heritage. These sectors are primarily supervised by different ministries: the Ministry of Culture for the protection and safeguarding of cultural heritage; the Ministry of Ecology for prevention efforts, including public information, hazard mapping, and structural disaster risk reduction measures; and the Ministry of the Interior for emergency response. As a result, the management of cultural heritage at risk appears to be constrained by sectoral approaches and lacks a more transversal or multidisciplinary approach.

Furthermore, knowledge and publications about this topic, both general and specialized, are unfortunately scarce, not truly systemic or comprehensive. Connections between the fields of prevention, protection and emergency response are rarely established. In France, expertise in this area is concentrated among a small number of specialists, mainly in the domain of emergency and rescue management. These observations are supported by two studies produced by the AFPCNT in collaboration with BbF in 2024. On the following pages, Figure 2 illustrates a schematic overview of public authorities and their respective roles, while Figure 3 presents a summary of the bibliographic sources identified.[7]

It should be a priority to develop a cross-cutting and awareness-raising approach targeting the widest possible audience, illustrated by specifying the respective responsibilities of different actors ("who does what?") for disaster prevention, mitigation, and crisis management, along with examples of best practices. Such an approach is appropriate in the current context of climate change and also aligns with international strategies for disaster risk reduction promoted by the United Nations and the European Union. It also aligns with the French national objective: "All resilient in the face of risks".[8]

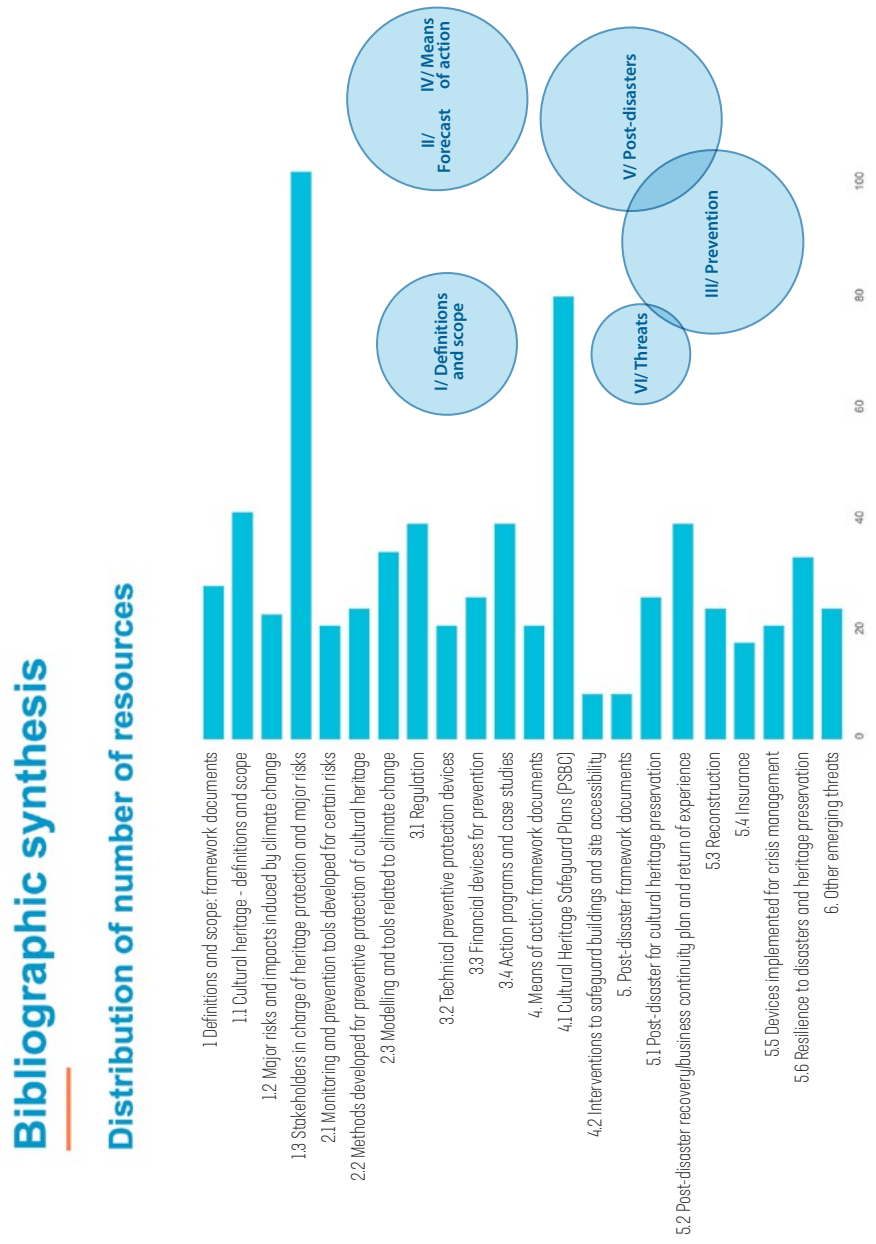
[7] AFPCNT, *Patrimoine et risques majeurs - Note de synthèse*. 2025 [***https://afpcnt.org/wp-content/uploads/2025/01/Note-de-synthese-AFPCNT.-PATRIMOINE-ET-RM-16052024.-.pdf***] Accessed 22 October 2025.

[8] In French « *Tous résilients face aux risques* ». In 2021, Barbara Pompili, French ministry of ecology, launched a flash mission to evaluate preparedness of populations in France dealing with disaster. A report called "*Mission sur la transparence, l'information et la participation de tous à la gestion des risques majeurs technologiques ou naturels*" (Mission about transparency, information and participation of all dealing with disasters, natural or human-induced) highlighted two principal points. On one hand, French citizens suffered from the lack of culture of resilience to risk (knowledge about hazards, ways to protect themselves, their living places and their environment). On the other hand, various organisations realized actions of sensibilisation but not in coordination. As a consequence, French Government fixed a national objective called "*Tous résilients face aux Risques*" (All of us resilient against risks) and officialised a national and mediatic day of resiliency (called "*Journée nationale de la resilience face aux risques*") *13th October in resonance with United Nations' International Day for disasters reduction*. At last, AFPCNT was designated by French ministry of Ecology to federate with agility a national network of organisations to reduce vulnerability of population by promoting culture of resilience to risk. [***https://www.ecologie.gouv.fr/sites/default/files/documents/RAPPORT%20FINAL%20CULTURE%20DU%20RISQUE%20JUIN%202021-1.pdf***] Accessed 22 October 2025.

What?	Who?	How?
Risk knowledge	• Ministry of Environment • Ministry of Agriculture (forest)	Funding of scientific and technical studies and data acquisition
Monitoring, prevention, forecasting	• Ministry of Environment • Ministry of Agriculture • Ministry of Interior • Ministry of National Education	Specific human organization and equipment of territories in instruments and tools for surveillance and forecasting of hydro-meteorological , marine-meteorological, hydrogeological phenomena, ground movements, volcanism
Information	• Ministry of Environment • Ministry of Interior • Mayor	The prefect establishes the DORM The mayor establishes the DICRIM The Ministry of Environment ensures national dissemination of information via the internet The Ministry of Environment informs citizens in real time of data relating to surveillance, vigilance and prevention
Education	• Ministry of National Education • Ministry of Environment	Inclusion in curricula Network of coordinators with rectors National day facing risks Training of professionals in risk management, buildings, planning, etc
Risk consideration in land use planning	• Ministry of Environment • Ministry of Housing • Mayor	Implementation of risk management plans for flooding (PGRI) Establishment of risk prevention plans (PPR) Compliance with regulations on prevention of seismic risk (seismic zoning, paraseismic construction rules), control of compliance with regulations Consideration of risks in planning documents and control of legality
Mitigation	• Ministry of Environment • Ministry of Housing • Local authorities	Training of professionals (architects, engineers, craftsmen) Funding of paraseismic reinforcement works for buildings vulnerable to earthquakes Funding of works to reduce vulnerability to ground movements Construction of hydraulic structures (retention basins, dynamic slowdown systems, dikes, etc.) Realization of vulnerability diagnosis and reduction works (dam failure, electrical networks downstream, etc.) Relocation of assets and activities outside risk zones
Crisis preparation	• Ministry of Interior • Mayor	Civil protection services or the mayor prepare the crisis
Crisis management	• Ministry of Interior (*Préfet*) • Mayor • Departmental fire and rescue service (SDIS)	Mobilization of resources (civil servants, public services, municipal civil security reserve, possibly armed forces)
Post-event recovery	• Ministry of Environment • Ministry of Housing • Ministry of Interior	Disaster analysis missions (REX) Capitalization of all data enabling improvement of risk knowledge, refinement of management and prevention plans, revision of planning documents, etc.
Compensation	• Natural Disaster Commission (Ministry of Economy, Ministry of Environment, Ministry of Interior, Central Reinsurance Fund)	Once a natural disaster has been declared, insurers implement a specific compensation procedure

2. Public authorities involved in prevention © Ministère de la Transition Écologique et de la Cohésion des Territoires[9]

[9] Source: Prévention des risques majeurs - SYNTHÈSE - La démarche française. 2016, p.7. Ministère de l'Environnement, de l'Énergie et de la Mer [***https://www.ecologie.gouv.fr/sites/default/files/documents/pr%C3%A9vention%20des%20risques%20majeurs%20demarche%20francaise%20ed%202016.pdf***]. Accessed 22 October 2025.



3. Summary of the bibliographic sources identified © AFPCNT[10]

[10] AFPCNT, *Patrimoine culturel et risques.* 2025 [***https://afpcnt.org/wp-content/uploads/2025/02/PPT-AFPCNT-ASK-WEBINAIRE-FEV-2025.pdf***] Accessed 28 October 2025.

At interface with the French government: a large NGO network mobilized to reduce disaster risks to heritage before, during and after extreme events

For the past 25 years, in partnership with the French Government, AFPCNT has represented the French civil society at the Global Platform for International Strategy of Disaster Reduction (UNDRR now). The organization is dedicated to promoting the dissemination and sharing of knowledge, methods, and tools related to disaster risk reduction, particularly concerning natural and human-induced hazards, in order to support resilience-building efforts aimed at preserving public health, environment, economic activities, material assets and cultural heritage.

Also, as a member of AFPCNT, BbF is specialized in the protection of cultural heritage during times of crisis. It serves as the French committee of Blue Shield International in alignment with the Hague Convention for the Protection of Cultural Property in the event of Armed Conflict. Its mission is to inform, raise awareness, and provide training to all audiences about the vulnerability of cultural heritage, as well as to initiate, facilitate, support, and promote all prevention and emergency response actions. Since June 2023, Blue Shield France holds, through its Emergency Response Organization (ERO) structure, a national civil security accreditation of category "A".[11]

AFPCNT and BbF have thus formalized their collaboration following a network-of-networks logic, to broadly promote a "culture of resilience to risk" among the various stakeholders in charge of cultural heritage, including those protecting it from natural and human-induced risks in the context of climate change.[12] The first joint initiative aimed to better understand French Government's current approach to dealing with disaster risks and cultural heritage (policies, strategies, stakeholders, etc.), to identify key resources and studies, to understand the role of heritage managers and owners and to examine and to promote best practices.

Collective intelligence and inclusive methodology to reduce risk vulnerability of heritage

The objective of this working group lies in defining and co-constructing awareness-raising that are widely accessible to the general public, as well as to private owners and managers of cultural heritage, in order to move towards an increase of preventive measures aimed at enhancing the resilience of cultural heritage.

The working method developed is based on collective intelligence, encouraging the exchange of perspectives and skills that are unfortunately still too often compartmentalized between environment/ecology, cultural heritage conservation, architecture and crisis management. Building the most global and inclusive approach

[11] ***https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000047670179***. Accessed 22 October 2025.
[12] For more details: ***https://afpcnt.org/projet/patrimoine-culturel-et-risques-majeurs/*** Accessed 22 October 2025.

possible would allow to respond to the needs and expectations of public and private managers in terms of knowledge and good practices.

National surveys to adapt tools and communication aimed at reaching heritage managers

AFPCNT, BbF, and their partners quickly recognized the need to better evaluate user profiles, namely private owners and managers of heritage sites (such as members of La Demeure Historique[13]). The following indicators were determined:

- knowledge and perception of disasters and human-induced risks;
- presumed levels of preventive preparedness for extreme events (e.g. implementation of structural and/or organizational protection measures such as the Cultural Heritage Safeguarding Plan-PSBC).[14]

Two versions of online surveys were realised: the first one targeting public managers of cultural institutions such as museums, libraries, archives and heritage sites, the second one designed for private stakeholders. Both were drafted by professionals of risk management and actors from the culture heritage field to foster engagement of management stakeholders in responding. Special care was taken to design a questionnaire that was concise and accessible. Particular attention was paid to the use of appropriate terminology, clear and illustrative formulations, and effective communication strategies suited to target audiences (2 to 3 weeks to respond, not more than 10/15 minutes to answer, etc.).

More than 220 answers were collected and analysed.[15]

Here are some key questions – answers collected:

Questions	Answers by public heritage institution managers	Answers by private heritage owners
Well-known hazards	**Floods 95 %** Storms 35 % Fires 35 %	**Storms 75 %** Floods 59 % Fires 44 %
Well-known human-induced risks	Industrial 45 %	**Nuclear/Industrial 15 %**

[13] For a century, La Demeure Historique, as a French NGO, has represented more than 3,000 private managers of cultural properties. More information on the Website ***https://www.demeure-historique.org*** Accessed 22 October 2025.

[14] Ministère de la Culture : Le Plan de Sauvegarde des Biens Culturels [***https://www.culture.gouv.fr/thematiques/securite-surete/securite-et-surete-des-biens/plan-de-sauvegarde-des-biens-culturels***] Accessed 22 October 2025.

[15] Analysis of the two surveys' summary presented on the AFPCNT web site (in French) : For public heritage managers: ***https://afpcnt.org/wp-content/uploads/2024/12/SLIDES-SONDAGE-PATRIMOINE-AFPCNT-BfB-28-oct.pdf*** and for private ones: ***https://afpcnt.org/wp-content/uploads/2025/08/INFOGRAPHIE-SONDAGE-2-V7.pdf*** Accessed 22 October 2025.

Questions	Answers by public heritage institution managers	Answers by private heritage owners
Main sources of knowledge	Media 86 % Professional training 65 %	Media 90 % Professional training 30 %
Structure located in a risk area	**Floods 61 %** Storms 32 % Nuclear/Industrial 32 %	**Yes 64 %** No 21 % No answer 14 %
Past experience with disasters	No 66 %	Yes 58 %
Who are the key actors for disaster risk reduction (DRR)?	**Crisis operators 89 %** Specialized NGOs 54 % Governmental and territorial institutions 50 %	**Heritage NGOs 56 %** Governmental and territorial institutions 53 % Ministry of Culture 41 %
Feeling able to respond to an extreme event?	Ready 55 % **Not ready 40 %**	**Not ready 71 %** For collections 19 % For site 18 %
Vulnerability assessment	Realised 21 % Not realised 36 %	Realised 13 % Not realised 61 %
Needs	Professional training 63 % Preventive information 48 % Help with diagnostics/PSBC 47 %	Preventive information 53 % Identification of actors DRR 47 % Help with diagnostics/DRR solutions/ financing 35 %

The results clearly show that heritage managers' knowledge of natural hazards is related to the territorial vulnerability to the area's most prevalent risks, such as floods and storms. For human-induced risks, the level of knowledge is lower (despite a serious accident such as the AZF factory explosion in Toulouse in 2001).[16]

This trend aligns with broader findings on risk awareness and perception within the general French population.[17] For public managers, risk perception does not appear to be systematically linked to past occurrence of events on properties, unlike private ones. Risk knowledge acquisition relies primarily on media. As per the public sphere, the second source of information refers to professional training and local prevention information documents. Both parties have a proper understanding of the role of prevention. However, the fact that firefighters are identified as primary contacts and the lack of awareness on the existence of advisory services for preventive protection reveal a need to further promote proactive, anticipatory strategies.

[16] Ministère chargé du Développement Durable. DGPR/SRT/BARPI, *Explosion dans l'usine de fabrication d'engrais d'AZF*. 2013. [***https://www.aria.developpement-durable.gouv.fr/wp-content/files_mf/A21329_ips21329_007.pdf***] Accessed 22 October 2025.

[17] AFPCNT IFOP, *Enquête de perception sur les freins et leviers du citoyen responsable face aux risques naturels et technologiques*. Juin 2024. p. 15 [***https://afpcnt.org/wp-content/uploads/2024/10/120676-Presentation-24.06.pdf***] Accessed 22 October 2025.

The non-profit sector emerges as an essential and trusted stakeholder for both parties. This is likely due to its working process agility but also to a communication bias of the survey.

Many responders were members of BbF (potentially trained for PSBC) or La Demeure Historique. Surveys confirm a lack of knowledge on procedures for vulnerability reduction of buildings and assets, and about planning.

For example, the Cultural Heritage Safeguarding Plan (PSBC)[18] is an operational framework document, made available to staff from cultural heritage institutions and emergency response services, designed to address situations posing risks to heritage assets with appropriate diligence and operational efficiency. It remains scarcely known, particularly among private actors. Wider dissemination and easier access to these tools are needed for both sectors. Finally, the cumulative data suggests that a lack of knowledge, limited personal preparedness and inadequate asset protection, all contribute to a widespread feeling of being unprepared to act in case of crisis. These same gaps emerge by the needs expressed by responders.

Responders seized the opportunity to express their expectations. They primarily seek dedicated resources and support not only for the purpose of acquiring knowledge and skills but also to conduct vulnerability assessments, identify financial assistance, and other related activities. A more detailed analysis of the available tools and of "who does what" in risk prevention and crisis management is among the primary future objectives of the Association. Responders also expressed strong interest in accessing best practices and lessons learned. These are developed within the framework of "Heritage resilience to major risks" sheets.[19]

These sheets, which contextualize heritage assets within their risk-prone environment as well as the damage incurred and the recovery phase, serve to highlight both the good practices and obstacles that mark the pathway toward heritage resilience.

These case studies have been developed under the coordination of AFPCNT in collaboration with the consultancy firm ASK. Through the invaluable guidance of BbF and the network of stakeholders around AFPCNT (French Association of Seismic

[18] Courselaud M., Périllat-Mercerot J., "Culture, Rescue: all hands on deck! National authorities to assist in drafting emergency plans to protect cultural heritage", in *PROCULTHER-NET Project, Technical Bulletin N. 2, June 2023*. pp. 58-64. ISSN2975-190X [***https://civil-protection-knowledge-network.europa.eu/media/culture-rescue-all-hands-deck-national-authorities-assist-drafting-emergency-plans-protect***] Accessed 22 September 2025.

[19] AFPCNT, *Fiches Patrimoine résilient face aux risques majeurs*, 2025. [***https://afpcnt.org/wp-content/uploads/2025/01/Fiches-actions-AFPCNT-PATRIMOINE-RESILIENT-12-2024.pdf***] Accessed 22 October 2025.

Engineering - AFPS[20], Major Risks Institute - IRMa[21], etc.), a co-construction methodology was implemented. Moreover, the mobilisation of heritage managers and specialised professionals such as heritage curators enabled not only the collection of event memory, fading over time, but also access to data that are difficult to reach and therefore unknown. These first case study sheets address the hazards of floods (slow and flash floods), coastal flooding, earthquakes, and industrial risks.

Conclusion

A better understanding of owner-managers is made possible not only through the data survey here presented, but also through an integrated multi-stakeholder approach. The ambition to increase cultural heritage protection from disaster events (both natural and technological) across all phases -before, during, and after- relies on building a community, a "working together" approach, and the use of inclusive, participatory methods to foster skill acquisition.

By encouraging cross-sectoral cooperation among disaster risk managers, numerous insights regularly emerge within the AFPCNT and BbF's working group. These insights constitute our compass, essential for mediation and skill development among managers to promote their capacity to prepare, anticipate, act preventively, thereby reducing disaster risks, optimizing crisis management phases when possible, and fostering recovery.

[20] Since 1983, AFPS's commitment to studying earthquakes and their consequences on soil, structures and their environment, as well as to research and promote all measures aimed at minimizing these consequences and protecting human lives. AFPS is a member of the European Association for Earthquake Engineering (EAEE) and the International Association for Earthquake Engineering (IAEE). More information ***https://www.afps-seisme.org***.

[21] The Major Risks Institute (IRMa) was established in 1988 on the initiative of Haroun Tazieff and the General Council of Isère. It is a non-profit association under the 1901 law whose objectives are to promote information, prevention and awareness-raising activities regarding major risks. More information ***https://www.irma-grenoble.com***.

The power of knowledge: strengthening national capacities for cultural heritage disaster risk management

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Introduction

If there is any silver lining to the devastating earthquakes that hit nine northern Croatian counties in March and December 2020, one of them would certainly be the UCPM co-funded project *Operational Forces of Civil Protection for the Protection of Cultural Heritage – CP for Heritage*. The earthquakes, most gravely impacting the capital of Zagreb and the towns of Sisak and Petrinja, damaged more than 900 individually listed heritage buildings, as well as numerous[1] heritage buildings within the cultural and historic areas of the city of Zagreb.[2] The disasters struck during the COVID-19 pandemic and subsequent lockdown, rendering emergency response and damage assessment that much more challenging.

The on-site emergency response naturally involved both heritage professionals and civil protection services, revealing in the process not only strengths, but also weaknesses of both actors. To enhance existing capacities (stemming primarily from the recovery after the Homeland War in the 1990s) and build new ones – while also encouraging cross-sectoral cooperation and raising awareness of the importance of cultural heritage protection – several initiatives were undertaken, one of which being the *Operational Forces of Civil Protection for the Protection of Cultural Heritage* project, led by the Civil Protection Directorate of the Ministry of Interior, with the Ministry of Culture and Media as associated partner.

[1] Comprehensive and precise data are still being collected; however, what is important to point out is that Zagreb itself comprises 20 cultural and historic areas consisting not only of buildings listed as individual cultural heritage sites, but also of those that contribute to the overall ambient value, showcase the development of the city throughout centuries and contribute to its understanding as historical, urban and architectural whole. The epicentre of the first earthquake (5.5 on a Richter scale in March 2020) was in Zagreb. The second earthquake (6.2 on a Richter scale in December 2020 and preceded by another earthquake of a 4.9 magnitude) was stronger, with the epicenter 50 kilometers southeast of Zagreb, severely damaging the historically important towns of Sisak, Petrinja and Glina, but being strongly felt in Zagreb as well, exacerbating the damage from the first one. Zagreb, Sisak and Petrinja combined, and in total 9 Croatian counties hit, amounts to probably several thousand buildings of cultural heritage significance suffering damage.

[2] Demšić M., Baniček M., Damage and Loss Assessment for Built Heritage after Destructive Earthquakes in 2020, "*The Preservation of Cultural Heritage in Croatia Annual*". 2022/2023 (46/47): pp. 21-36 [***https://hrcak.srce.hr/clanak/454635***] (in Croatian only) Accessed 31 August 2025

The Operational Forces of Civil Protection for the Protection of Cultural Heritage project

The project lasted between January 2024 and February 2025, consisting of several activities: a five-day workshop, incorporating both theoretical and practical parts (comprising a final simulation exercise on emergency evacuation of cultural goods), study visits to Italy and France, a tailor-made, advanced course for a more focused group of trainees organised by ICCROM's FAR program, and a final conference. It led to the drafting of *Guidelines for Standard Operating Procedure (SOP) for the operation of Civil Protection Operational Forces and the Cultural Heritage Sector in Emergency Situations*[3], as well as *Capacity Building Activities and Interdepartmental Cooperation Plan 2025-2027*. It should be underscored that the project marked the first formally structured and established cooperation on cultural heritage between the two sectors, and the workshop was one of the first educational opportunities of its kind to include representatives of almost all branches of both sectors[4] to be carried out at national level in Croatia.

The five-day workshop program was inspired by the trainings implemented by PROCULTHER-NET, and for good reason: several members of the project team participated in the training organised in the framework of PROCULTHER-NET in Volterra in 2023[5], and had previous experience in international workshops, such as ICCROM's PREVENT courses (twice held in the Croatian town of Trogir). Furthermore, immediately after the December 2020 earthquake, the Italian "Blue Helmets for Culture" were deployed to Croatia to help evacuate damaged goods, as well as to transfer their valuable knowledge and experience (more precisely regarding establishing and setting up of temporary storages). This certainly contributed to the decision to choose Italy as one of the locations for a study visit and to learn in greater detail from its practices and challenges when it comes to protecting cultural heritage in emergencies.

The three-day study visit[6] – involving five of the project team members – took place in March 2024 and was organised by the representatives of the Italian Civil Protection Department who also make up the core PROCULTHER-NET team. On the first day, the Croatian delegation visited the headquarters of the Italian National Civil Protection Department and was given the opportunity to hear from the experts' experience first-hand.

[3] The Guidelines are publicly available at the following link: ***https://civil-protection-knowledge-network.europa.eu/projects/cpforheritage***.

[4] Trainees came from different institutions: state and Zagreb City conservation departments, State Intervention Unit, Croatian Mountain Rescue Service and Croatian Firefighters Unit.

[5] PROCULTHER-NET Webpage. May 2023. European Training for the protection of cultural heritage at risk [***https://civil-protection-knowledge-network.europa.eu/news/european-training-protection-cultural-heritage-risk***] Accessed 24 October 2025.

[6] PROCULTHER-NET 2 Webpage. June 2024. Building the PROCULTHER-NET Community: Croatian and Turkish experts in Italy [***https://civil-protection-knowledge-network.europa.eu/news/building-proculther-net-communitycroatian-and-turkish-experts-italy***] Accessed 24 October 2025.

1. Visit to the headquarters of the Italian National Civil Protection Department © Pia Sopta

For instance, representatives from the National Fire and Rescue Service presented the role and – often very complex and specific – operations of the National Fire and Rescue Service during emergencies, spotlighting also the highly regarded "***VADEMECUM STOP***" manual ("Shoring Templates and Operating Procedures for the support of buildings damaged by earthquakes")[7]. The representatives of the Ministry of Culture – in close contact with the civil protection personnel during emergencies – gave an overview of the Ministry's procedures and protocols, while the members of the *Carabinieri Command for the Protection of Cultural Heritage* highlighted their particular role in crises. The visit to the headquarters ended with the tour of the premises and discussions with dedicated experts from respective departments.

The second day of the visit focused on the know-how provided by the senior officers of the Ministry of Culture, tackling in their presentations specific aspects of cultural

[7] Bolognese, C., *The role of the Italian National Fire and Rescue Service for the protection of cultural heritage during emergency* in *PROCULTHER-NET2 Technical Bulletin N.4, December 2024.* pp. 57-64. *ISSN2975-190X- ISBN 978-88-6864-548-9* [***https://civil-protection-knowledge-network.europa.eu/media/role-italian-national-fire-and-rescue-service-protection-cultural-heritage-during-emergency***] Accessed 22 October 2025.

heritage protection: management of archaeological cultural heritage, procedures and protocols in the event of a disaster, management of *debris*[8] or fragments of cultural interest (the so-called *macerie*)[9], introduction to the topic of temporary storage facilities, and the role of the above mentioned special task force "Blue Helmets for Culture". The representatives of the Ministry of Culture and Media of the Republic of Croatia held a presentation on Croatian experiences in cultural heritage risk management, emphasising important contributions of Italian experts to Croatian activities in the aftermath of the earthquakes: the "Blue Helmets for Culture" international mission in January 2021 and the participation of a chief conservator for earthquake-affected areas in the advisory body founded by the Croatian Ministry titled "Expert Advisory Committee for Structural Renovation of Architectural Heritage in the Earthquake Stricken Areas of the Republic of Croatia". They also underscored the significant steps undertaken by the Ministry of Culture and Media in the past years, among them the establishment of the Sector for Risk Management and the Geoportal of Cultural Property of the Republic of Croatia platform[10], as well as the adoption of the new Act on the Protection and Preservation of Cultural Heritage in December 2024.[11]

The Croatian delegation then headed to Norcia in the province of Umbria which was hit by a series of earthquakes in 2016, the two strongest having been recorded on 24 August and 30 October. The group visited the Basilica of St. Benedict and the town hall, and then briefly toured the buildings in the vicinity, including the co-cathedral of Santa Maria Argentea. The visits enabled the delegation to acquaint itself with the newest approaches and technologies applied when it comes to post-earthquake recovery - respecting the specificities of each structure - and to see in person the challenges for the conservators and restorers, as well as how they addressed those conundrums and what decisions they made in respect to them.

[8] Agostiano, M., Esposito, S., Marrese, G., "Earthquakes debris of cultural interest: the Italian methodology for their management, selection and reuse (Part a. Regulatory provisions and operational indications)". *PROCULTHER-NET2 Technical Bulletin N.3 July 2024*. pp. 72-82 [***https://civil-protection-knowledge-network.europa.eu/media/earthquakes-debris-cultural-interest-italian-methodology-their-management-selection-and-reuse***] Accessed 20 September 2025.

[9] Agostiano, M., Buono, V., Marrese, G., Santelli, A., "Earthquake debris of cultural interest: the Italian methodology for their management, selection and reuse (Part b. Some examples after the Central Italy earthquake of 2016)". *PROCULTHER-NET2 Technical Bulletin N.4 December 2024*. pp. 44-56 [***https://civil-protection-knowledge-network.europa.eu/media/earthquakes-debris-cultural-interest-italian-methodology-their-management-selection-and-reuse***] Accessed 20 September 2025.

[10] Geoportal of Cultural Property of the Republic of Croatia [***https://geoportal.kulturnadobra.hr/?lang=eng***] Accessed 30 October 2025.

[11] Act on the Protection and Preservation of Cultural Heritage (in Croatian only), NN 145/2024 (13.12.2024.), Zakon o zaštitiiočuvanjukulturnihdobara [***https://narodne-novine.nn.hr/clanci/sluzbeni/full/2024_12_145_2369.html***] Accessed 20 September 2025.

On the third and last day, the team visited the Santo Chiodo temporary depot. The opportunity to see and examine a temporary storage facility in person, under expert guidance, was of great value to the delegation, by acknowledging the fact that the establishment of temporary depots in Croatia will undoubtedly be given serious thought as its advances on the post-earthquake recovery path.

The final stop before departure was the Sant'Eutizio Abbey near Piedivalle in the municipality of Preci, another captivating and specific case study, providing, *inter alia*, insight into the technique of consolidating the wall structure in the crypts of the church, namely by tying stones with wires, a method tested on this location for the first time.

Looking at the Italian cultural heritage protection system from both civil protection and cultural heritage angles was another proof of just how layered and

2. Tour of the Basilica of St. Benedict and the town hall in Norcia
© Pia Sopta

3. In the Santo Chiodo temporary depot © Pia Sopta

4. Simulation exercise in Sisak © Civil Protection Directorate, Ministry of Interior of the Republic of Croatia

multifaceted cultural heritage risk management is, and that one of its pre-requisites is indeed a close, structured and regular cross-sectoral cooperation, not only in times of crises, but also in "peacetime" when preparedness is built, strengthened and finetuned. The same conclusions were drawn from a study visit to France in April 2024, as well as a later tailor-made training implemented by ICCROM's FAR team in February 2025 in Rome. On both occasions, the significance of three key elements was emphasised: risk assessment, prevention and preparedness.

These postulates were processed in the central workshop of the *CPforHeritage* project, gathering forty civil protection (including members of Civil Protection State Intervention Unit, the Firefighters' Association and the Croatian Mountain Rescue Service) and heritage professionals over five days in November 2024. The trainees became acquainted with the main characteristics and components, procedures and protocols specific to each field, balancing both theory and practice. Particularly noteworthy was the fact that a practical exercise and the final simulation exercise were held in towns of Sisak and Petrinja – severely damaged in the December 2020 earthquake and currently going through a post-disaster recovery – mentored by the colleagues from the Sisak conservation department.

What changed in the Croatian approach to cultural heritage protection after the project

The *Operational Forces of Civil Protection for the Protection of Cultural Heritage – CP for Heritage* project was just a start of a more systematic and concerted approach to post-disaster protection of cultural heritage. The primary goal of the project was to create an environment for a more formalized and institutionalized cooperation between the two sectors, which was achieved by not only connecting the personnel from the Zagreb headquarters, but also that from different regional and local conservation and civil protection departments. Throughout those fourteen months – study trips, training and workshops, final conference, experts shared experiences, co-designed projects and worked together on devising the Guidelines for Standard Operating Procedures and the Cooperation Plan. The project gave rise to a number of local initiatives such as fire risk mapping in Istria and fire mitigation for cultural institutions projects in the Split-Dalmatia County and Dubrovnik-Neretva County that are still ongoing. It also revealed vulnerabilities: lack of human resources, incompatibility of data collecting and sharing systems, and lack of knowledge and incompatibility of protocols. Also, what emerged was a different perception of cultural heritage risk management as a sectoral priority (or one of them), irregular representation of Croatian regions in the project, as well as necessity of adjusting the legal framework so as to prepare it to welcome the establishment of interagency teams ready to be trained further and, in the long-term, deployed in the event of disaster.

Conclusion

All things considered with a view to the future, the project contributed to awareness raising, closer examination of home-grown and European/international protocols and tools that could be adopted, and gave way to integration of cultural heritage into national risk assessment frameworks. Simultaneously, a new Act on the Protection and Preservation of Cultural Heritage was adopted in December 2024, addressing explicitly cultural heritage protection in exceptional circumstances, providing thus a legal basis for closer interagency cooperation.

In conclusion, the project will hopefully continue to evolve and plant seeds for the creation of qualified, expert teams at national level, better understanding of risks, and further training and learning opportunities. It created a momentum and opened doors to prospects that did not exist in the past, certainly not in such a formalized, systematic context. Indeed, representing a real testament in terms of how creating networks, exchanging experiences and raising awareness by way of cross-sectoral and international cooperation can contribute to the advancement of risk management of cultural heritage. Finally, it remains crucial to keep aware and alert of the relevance of the topic as we continue to face increasingly complex challenges threatening cultural heritage in the years to come.

Learning by doing for heritage protection: bottom-up exercises in Southern Dalmatia as a path to procedural innovation

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In southern Croatia, two recent civil protection exercises - "Ston Heritage 2025" and "Sacred Heritage 2025" - served as real-world laboratories for the improvement of disaster preparedness in cultural heritage protection. Held in neighbouring municipalities exposed to wildfire and earthquake risks, the exercises brought together emergency responders and heritage professionals to explore practical challenges, test assumptions, and build cross-sectoral cooperation where formal protocols are still incomplete or absent.

Introduction: context and rationale

In contexts where formal disaster preparedness protocols for cultural heritage are limited or nonexistent, municipal-level civil protection exercises can serve as a critical function. In Croatia, all local governments are legally required to develop risk assessments for major emergencies, as well as to conduct civil protection exercises aligned with those assessments. Yet in practice, references to heritage are often superficial, mere lists of monuments without any assessment of their actual susceptibility to risk.

At the same time, firefighting forces - often the first to respond in emergencies - are established by municipalities based on fire risk assessments that do not take cultural heritage into account. This institutional disconnection leaves many heritage sites underprepared, especially in regions where exposure to wildfire and seismic risks is high, and where fire protection within heritage buildings is frequently inadequate.

Southern Dalmatia presents such a case. The area is rich in movable and immovable cultural heritage, yet faces increasing environmental and disaster-related pressures. Against this backdrop, civil protection exercises are highly recommended – proving to be actual laboratories for discovering procedural gaps and building common ground across sectors.

These efforts also resonate with broader UCPM-funded initiatives such as PROCULTHER and CPforHeritage, which have promoted joint procedures, inter-agency training, and shared methodologies for cultural heritage in emergencies.

Approach: learning through exercises

This article presents two recent exercises conducted in neighbouring municipalities – "Ston Heritage 2025" and "Sacred Heritage 2025" - as case studies of procedur-

al innovation from the ground up. They were both launched by the Regional Civil Protection Service with the idea to implement the knowledge gained at local level through the CPforHeritage project.

A key point of these exercises was the continuity of participants across both simulations: the same civil protection officers, firefighters, police officers, conservators, and mountain rescue service officers took part, supported by a shared institutional structure spanning across both areas. This allowed for cumulative learning, strengthened coordination, and common reflection.

Another critical enabler was the two-day workshop held prior to the Ston exercise, during which participants from different services and ministries were introduced to each other's roles, terminologies, and expectations. A highlight of the workshop was a case study presented by a senior conservator from another region, who shared her experience managing a fire emergency in a monastery. The most valuable lessons she presented came from her collaboration not only with emergency services but also with the priest, and, upon further analysis, from the challenges she faced.

The presentation grounded the workshop in a real-world scenario and provided a shared frame of reference that participants carried into the full scale exercise that followed.

Though the two exercises differed in format - one focused on operational coordination in the field, the other on tabletop decision-making - they shared a common insight: when protocols are missing or incomplete, structured exercises allow for controlled improvisation, through which stakeholders can identify vulnerabilities, negotiate responses, and begin to build the procedures that are otherwise lacking.

The first exercise, "Ston Heritage 2025", focused on field coordination and tested the operational dynamics of cultural evacuation under pressure. It is presented here as Case Study 1.

Case Study 1: "Ston Heritage 2025" - Building coordination through controlled scenarios

Initiated by the Regional Civil Protection Service and organised by the Municipality of Ston and its Civil Protection Headquarters, in cooperation with the regional offices of the Ministry of Culture and Media (through the conservator departments in Dubrovnik and Trogir) and the Croatian Conservation Institute, the "Ston Heritage 2025" exercise was conducted on 11 April 2025, following a two-day preparatory workshop. Operational participants included firefighters, police, the Croatian Mountain Rescue Service (HGSS), conservators from the Ministry's regional departments, and conservator-restorers from the regional unit of the Croatian Conservation Institute.

1. Interdisciplinary team at the "Ston Heritage 2025" field exercise © Bruno Diklić

The main purpose was to simulate a fire threatening a church environment containing replicas of movable heritage objects. These realistic props, crafted by conservator-restorers, reflected the typical size, material, and weight of high-value items that might be found in such settings, adding a critical layer of realism to the exercise. Unlike conventional exercises where everything is defined in advance, the scenario of this exercise was disclosed only minimally, forcing participants to improvise collaboratively in their response.

This format allowed the testing of coordination in conditions that mirrored the complications of a real emergency. Communication protocols between the emergency services and conservators were not scripted but developed in motion, yet because participants had built relationships and shared reference points during the preparatory workshop, their actions remained structured and goal-oriented.

One of the key moments occurred when the call to evacuate was made before the police arrived to secure the site - a procedural oversight, as the police must first ensure safety and preserve evidence. This incident sparked immediate reflection and later informed a follow-up workshop. The goal of the workshop was to improve the authorities' understanding, duties and internal procedures of every service involved.

Another challenge arose when attempts to contact a structural engineer (for safety assessment operations) failed during a critical phase when immediate structural assessment was needed to safely proceed with evacuation and response. This was

2. Hands-on laboratory during the "Ston Heritage 2025" course © Ana Miličić

partly because the Croatian Centre for Earthquake Engineering (HCPI) had only recently been established, and its operational role and procedures were still being defined.

The on-site placement of a tent by HGSS, the triage and handover of heritage items to restorers, and the chain of command established between local officials and cultural professionals demonstrated how operational logic can be co-created on the spot, so long as a shared framework of values and priorities exists. The exercise became, in effect, a real-time rehearsal of trust.

These experiences directly led to the organisation of a cross-sectoral meeting held shortly afterward (in May 2025) at the regional conservation and restoration centre, where representatives of police and fire services met with heritage professionals to explore mutual expectations and refine future collaboration protocols - highlighting how one controlled exercise can trigger a wider procedural evolution.

Case Study 2: "Sacred Heritage 2025" - Making sense of responsibility in a shared landscape

Organised by the Municipality of Janjina with the Regional Civil Protection Service and conservator office, the "Sacred Heritage 2025" exercise took place two months after Ston. As both municipalities share the same mountain rescue service, police station, regional conservation service and civil protection service, many participants overlapped - a continuity essential for deepening cooperation and reinforcing lessons learned.

While the Ston exercise focused on operational coordination during a simulated fire, the Janjina exercise took the form of a tabletop command simulation aimed at testing roles, responsibilities, and communication chains in the event of cultural heritage being endangered.

It is important to understand that Janjina is a very small municipality with very few inhabitants and limited local operational forces. That is why it was easier to conduct a tabletop exercise that brought together municipal officials (as well as members of the municipal Civil Protection Headquarters), regional emergency responders, conservators, and a structural engineer representing the HCPI.

The exercise also included a consultant involved in the municipality's risk assessment process, providing expertise in its design and revision. By analysing and explaining the document's logic, he enabled reflection on how heritage risks are (or are not) represented. At the same time, direct exposure to operational dynamics gave him a clearer sense of what heritage represents in a small community - beyond legal status, also its emotional and spatial value - a perspective he can bring into future assessments.

3. Site visit to a historic chapel prior to the exercise, assessing the condition of the building and its surrounding
© Ana Miličić

One of the first insights from the Janjina exercise was a sobering one: although cultural heritage sites were listed in the municipality's official risk assessment, the only item officially designated as protected was a single painting, which was not even located at its original site. The exercise showed that many buildings assumed to be protected were in fact unregistered, while some listed churches lacked formal designation. Clarifying such distinctions matters operationally: in emergencies, registration status often determines whether an asset is prioritised under official protection protocols. Yet legal designation does not always match the local perception of value. For the community, a non-registered site – such as a locally significant gathering place – may hold equal or greater importance than officially listed heritage. For this reason, effective protection priorities require reconciling formal criteria with community values, testing them in advance, and ensuring that response plans reflect both. This balance can only be achieved through dialogue between experts and the community, so that protective actions safeguard not only what the law recognises, but also what sustains local identity.

These insights led to immediate and practical conclusions: for example, that in the event of fire or earthquake, police protection should be directed to a single location where all high-value movable heritage is currently stored. Participants also recognised the need to develop a clear contact list of those who can provide access to heritage buildings in case of emergency - an issue that had surfaced in the Ston exercise but was now formalised as a procedural priority.

The tabletop format allowed space for collective scenario analyses, where participants moved beyond the theoretical and engaged with specific cases - reviewing maps,

4. Tabletop simulation during the "Sacred Heritage 2025" exercise. Local officials and responders analysing scenario maps and coordination chains © Ana Miličić

examining church conditions, and identifying site-specific risks such as vegetation overgrowth or limited vehicle access. While no physical intervention took place, the simulation pointed out both abstract responsibilities at local level and real constraints.

Ultimately, the Janjina exercise served as a mirror to the planning system itself. It showed that even where legal frameworks exist, they require local interpretation, intersectoral translation, and periodic revision in light of changing realities. Rather than waiting for external direction, participants used the space of the exercise to initiate a bottom-up reconsideration of how cultural heritage is represented, prioritised, and protected in municipal risk governance. Lessons learned are not only captured through experience but also documented in the exercise report, along with conclusions that are disseminated both horizontally and vertically.

From exercises to systemic insights

The exercises and incident took place on the Pelješac peninsula, located in southern Dalmatia, Croatia. Administratively, the peninsula is divided into four municipalities. The "Ston Heritage 2025" and "Sacred Heritage 2025" exercises were conducted in Ston and Janjina, while the real incident occurred shortly afterward in Orebić - underscoring the shared vulnerabilities and the need for regionally coordinated procedures.

This urgency was confirmed only weeks later, when a fire broke out in a church in Orebić - one of the four municipalities on the peninsula. Two protected heritage items were completely destroyed. Although the blaze was quickly extinguished by local firefighters, while police ensured site security and supported post-incident in-

vestigation, the event exposed critical issues: delayed notification of conservation authorities, lack of clarity in response, and well-intentioned community actions that risked causing further damage.

Despite a delay in notifying conservation authorities, the Regional Civil Protection Service and heritage institutions eventually carried out an on-site damage assessment and launched a consultation process to improve future coordination. This was followed by a meeting between the chief of the police station, the head of the conservation service and the head of the restoration department, organised by the head of the Regional Civil Protection Service with the intention of establishing internal protocols for emergencies involving cultural heritage in the region. Measures agreed

5. Interior of the church in Orebić after the fire in June 2025, showing damaged inventory and response traces © Ana Miličić

included sharing georeferenced data on heritage sites, defining roles in emergency notification, and drafting preventive guidelines for religious custodians.

Conclusion: a path to procedural innovation

The sequence of activities - two structured exercises, followed by a real emergency and procedural refinement afterwards - offered a rare opportunity to observe how experiential learning can influence planning systems. The exercises demonstrated that even in the absence of fully developed top-down protocols, local initiatives can catalyse innovation. In this case, the incident validated the premise of the exercises: that cultural heritage cannot wait for perfect systems, and that progress is the result of a dual process between experience and regulation.

By framing cultural heritage as a shared responsibility and investing in collaborative exercises that combine realism with reflection, local communities can move beyond symbolic references in planning documents by instead, beginning to build living procedures - tested, revised, and owned by those who must act in emergencies.

Cultural heritage, by its nature, demands more than generic treatment. It calls for tailored approaches, timely decisions, and the involvement of specialized actors. Recognizing this in planning is not a luxury - it is a prerequisite for meaningful protection.

Key takeaways and recommendations

Based on the two exercises and the real incident that followed, the following recommendations are proposed to support the integration of cultural heritage into civil protection planning frameworks at the local level:

- Local civil protection exercises can reveal overlooked vulnerabilities/risks and help develop realistic procedures for protecting cultural heritage during emergencies.
- Interdisciplinary continuity across exercises strengthens trust, mutual understanding, and cumulative learning - especially in regions served by the same institutions.
- Planning documents such as the Risk Assessment of Major Accidents should reflect not only the presence of heritage assets, but also various aspects of their vulnerability and the requirements for their protection.
- Civil protection action plans should treat cultural heritage as a distinct operational category, requiring specific timing, procedures, and expertise.
- Heritage-related expertise as well as the related community should be involved in planning processes and scenario development, especially in areas with a concentration of significant cultural sites.
- Exercises serve as a bridge between institutional frameworks and real-world situations, enabling local actors to test assumptions, identify gaps, and initiate procedural improvements from the ground up.

The development of regional civil protection mobile units for the protection of cultural heritage in emergency situations

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Introduction

Italy is clearly a hazard prone country: earthquakes, floods, landslides, fires, follow one another, year after year, across the whole national territory, putting a toll on the national civil protection service. Nevertheless, the impact of numerous natural hazards throughout history has provided the opportunity to learn a lot from past experiences and to become fully aware that the prevention and preparedness phases make a huge difference. Setting up specific legal frameworks, procedures, emergency planning and tools dedicated to protecting cultural heritage is of primary importance. Among those prevention and preparedness actions, it is now evident to the Italian National Civil Protection Service (*Servizio Nazionale di Protezione Civile-SNPC*, in Italian)[1] that having mobile units specifically dedicated to the protection of cultural heritage is key to a proper disaster risk management process.

In Italy, the Regional Disaster Response Buffer Capacity (*Colonna Mobile Regionale-CMR*, in Italian) refers to a coordinated system of resources made up of trained volunteer teams, vehicles, equipment, and specialized operational mobile units.[2] These regional capacities are maintained in readiness for rapid deployment both within their own region and in support of other regions during major emergencies. The specialized units are self-sufficient operational

[1] According to Legislative Decree No. 1 of January 2, 2018, "Civil Protection Code", SNPC carries out civil protection functions, which include competencies and activities aimed at safeguarding lives, physical integrity, property, settlements, animals and the environment from damage or the risk of damage caused by natural or human-induced events.

[2] It is worth noting that the term used in Italian law to define these specialized units is 'module,' exactly as in the European context. To avoid confusion with the concept of European Civil Protection Modules, in this article the term 'mobile unit' will be used to refer to the particular teams and equipment that are the focus of this contribution.

units designed to perform specific emergency functions, such as firefighting, search and rescue, logistics, medical assistance, or the protection of cultural heritage.

A mobile unit is a team of trained people equipped with specific resources and means for the protection and safeguard of cultural heritage, immediately available and ready to be deployed in case of need. The primary objective of a mobile unit is to provide a rapid and effective response to emergencies involving movable cultural heritage.

This includes immediate stabilization of artefacts, thorough documentation, and, when necessary, their safe transport to secure temporary warehouses. The framework guiding this initiative is built around three fundamental pillars:

1. **Preparedness:** This involves identifying vulnerable cultural sites, pre-planning logistics, and acquiring the necessary equipment and resources, including training volunteers who work in the mobile unit. Detailed risk assessments and contingency planning form the backbone of this phase.
2. **Response:** During emergencies, the mobile unit is deployed with tools, vehicles, and trained personnel capable of addressing various scenarios. This includes managing waterlogged books, stabilizing damaged assets, and preserving fragile materials.
3. **Recovery:** After immediate threats are mitigated, efforts shift to restoration and reintegration. This phase ensures that cultural artefacts are restored by specialized conservators to their original state and returned to their communities where possible, with improved protective measures. If, during the response phase, cultural heritage assets are managed by trained and competent personnel, the subsequent recovery phase will be easier and more effective.

By integrating these three components, the framework promotes a comprehensive approach to safeguarding cultural assets during emergencies.

Funding of equipped units for the rescue of cultural heritage assets

Starting from the awareness of the need to strengthen the response capacity of the National Civil Protection Service, during the first decade of the 21st century, thanks to the involvement of the regional civil protection structures, numerous training activities were organized in various Italian regions. These initiatives aimed to create pools of volunteers specialized and trained in the safeguarding of cultural heritage, followed by field exercises designed to test the response capacity of the civil protection system in this sensitive sector.

With the aim of giving an impulse in the same direction, the Italian Civil Protection Department, beginning in 2017, issued the Decree-Law No. 50, which allocated funds for the purchase or maintenance of vehicles and equipment required for operations

supporting relief efforts for the population, intended for the national components or operational structures of the National Civil Protection Service.[3]

Within this funding framework, the Marche Region and the Tuscany Region, building on the experience gained in their territories over the past years, submitted projects for the acquisition of equipment for mobile units dealing with the protection of cultural heritage assets.

The aim was to strengthen the response capacity of regional civil protection structures in the face of extreme natural events, with a particular focus on interventions for the rescue, safeguarding, and securing of movable cultural heritage assets at risk or damaged.

Overview of the situation prior to the establishment of the Marche Region mobile unit

In the Marche Region, collaboration among the Ministry of Culture - MiC, the Regional Department of Civil Protection, the Legambiente[4] volunteer association, with the support of other institutions, led to the creation in 2004 of a training course for volunteers specialized in the protection of cultural heritage.

In 2007, this initiative resulted in an agreement, signed among the same parties, to promote heritage safeguarding from natural hazards throughout the region. In the following years, numerous activities were carried out within the framework of this agreement.

Between 2008 and 2017, volunteers participated in numerous operations, including debris clearing at the Nicola Vaccaj Theatre in Tolentino after the 2008 fire, the training exercises at Urbino's Palazzo Ducale (2009) and the Rocca of Gradara (2011), as well as the relocation of 1400 linear meters of archival materials of the Civil Registry Archive of the Province of Ancona (2012), thanks to the participation of about 100 civil protection volunteers.

Following the 2016 - 2017 Central Italy earthquake, Marche volunteers took part in 96 interventions to secure cultural heritage assets across the provinces of Macerata, Ascoli Piceno, and Fermo.

[3] Article 41, paragraph 4, of Decree-Law No. 50 of 24 April 2017, converted, with amendments, by Law No. 96 of 21 June 2017, as subsequently amended by Article 16-sexies, paragraph 5, of Decree-Law No. 91 of 20 June 2017, converted, with amendments, by Law No. 123 of 3 August 2017, provided for the allocation of €179.6 million for the purposes described above. (*Extraordinary plan for the acquisition and maintenance of equipment required for supporting civil protection operations – implementation of Article 41, paragraph 4, of Decree-Law No. 50/2017*) See (Italian only): ***https://www.protezionecivile.gov.it/it/approfondimento/acquisto-e-manutenzione-dei-mezzi-impiegati-il-soccorso-della-popolazione***.

[4] Legambiente is an Italian non-profit organization founded in 1980. It's the most prominent and widespread environmental association in Italy with two headquarters in Rome and Milan, 20 regional coordination offices and more than 600 local groups of volunteers. Web site ***https://www.legambiente.it/english-page/***

The Marche Region shelter equipped for the protection of cultural heritage

Following the experience gained and, considering the opportunities offered by the Decree-Law No. 50 of 2017, it was decided to acquire a shelter equipped to serve as a technical laboratory for the rescue of cultural heritage assets, to meet the needs of the emergency response centres.

The characteristics of this particular shelter were defined based on the operational requirements of the intervention contexts in which it will be deployed. It features construction specifications designed to ensure greater long-term durability, reduced maintenance needs, and ease of repair.

The shelter is also intended to serve as a technical area for carrying out specialized operations related to the retrieval, stabilization, cataloguing, handling, and/or temporary storage of works of art or other cultural assets, including to provide assistance in such activities, without the need to transfer them outside the operational area. The shelter can be mounted on vehicles designed for mobility, allowing its proper implementation and operation in any situation requiring immediate effective technical or environmental response.

It is characterized by structures that combine functional autonomy, independent of any fixed power supply at the deployment site, with full mobility to ensure rapid intervention, quick deployment, safety, operational hygiene, and ease of use and maintenance.

Thanks to its design, the shelter can be easily adapted into a mechanical workshop. Indeed, to provide a better internal mobility for operating personnel, the shelter is built with two extendable and retractable areas that can be extracted from the main supporting structure. These areas are designed to completely clear the central zone of equipment, which is instead housed within the extended sections. These "movable bodies" can then be easily repositioned within the base footprint for transport and handling of the assets.

1. The Marche Region shelter equipped for the rescue of movable CH assets © Regione Marche

The shelter therefore includes two structural elements, each consisting of a single body made up of three sides (a wall, a roof, and a floor), with an external width of approximately 3500 mm. Each element is mounted on three-section telescopic supporting arms/brackets, allowing extraction and sliding along the side of the main body, and is equipped with external stabilizing and support feet. In its extended position, the floor is designed as a hinged unit connected to the central body, allowing it to be raised or lowered as needed to provide adequate clearance and ensure a continuous, leveled walking surface, thereby reducing any potential tripping hazards for operators. The equipment available inside includes: an air compressor, fume hood, freezer, cantilever hoist for lifting and moving loads inside, oil-resistant rubber-covered workbench with drawers underneath, generator set, sink with hot and cold water, vacuum cleaner, and various manual tools (scrapers, brushes of different sizes, etc.).

The shelter is suitable for use both at daytime and nighttime:

- In areas affected by disasters of any kind;
- In continental climate conditions, with a temperature range of approximately -19 to +49°C;
- In environments with high humidity levels;
- In saline/sandy environments with high corrosive potential;
- In environments exposed to sun and atmospheric conditions, with good snow load resistance typical of mountainous areas, even in open configuration.

Deployment and operational setup times are very short. When carried out by personnel with intermediate training, times range from 20 to 40 minutes, depending on the deployment site.

Examples of deployments of the Marche Region mobile unit

The opportunity to test the usefulness and practicality of the mobile unit in cultural heritage rescue activities arose in 2022, during the transfer of the volumes of the Valentiniana Library of the Municipality of Camerino. It was a team effort among institutions (Marche Region, Ministry of Culture, Municipality) and approximately 200 civil protection and third-sector volunteers, who enabled the transfer and relocation of the Library's assets.

2. Initial operations to prepare volumes for transport to the new temporary premises of the Biblioteca Valentiniana
© Regione Marche

The operation allowed the rescue of a heritage collection that needed protection and safeguarding, consisting of

3. Cataloguing of the volumes of the Biblioteca Valentiniana at the new temporary premises © Regione Marche

150,000 valuable ancient books and incunabula belonging to one of the largest and oldest libraries in the Marche region.

Overview of the situation prior to the establishment of the Tuscany Region mobile unit

Prior to the formal creation of the Cultural Heritage mobile unit (CH mobile unit) within Tuscany's Regional Disaster Response Buffer Capacity (CMRT), this Region had already demonstrated a strong commitment to protecting cultural heritage during emergencies. As early as 2005, the *Piano per l'Arno* introduced strategic approaches to managing the river and its surrounding territory, with particular attention to safeguarding cultural assets.[5]

Over the years, several large-scale exercises helped build regional expertise in this

[5] Galloway G. E., et al., "Reducing the Flood Risk of Art Cities: The Case of Florence", in *Journal of Hydraulic Engineering*, Volume 146, Issue 5. [***https://www.tuwien.at/index.php?eID=dumpFile&f=151158&t=f&token=e30a3d3dc28ab9ff5aa39f657988237e8d3ec0c4&utm***] Accessed 29 October 2025. Castelli F., Arrighi C., Brugioni M., Franceschini S., Mazzanti B. "Micro-scale flood risk estimation in historic centres: a case study in Florence, Italy*". Geophysical Research Abstracts* - Vol. 15, EGU2013-9787, 2013. EGU General Assembly 2013; Arrighi C., Brugioni M., Castelli F., Franceschini S., Mazzanti B. "Flood risk assessment in art cities". *Journal of Flood Risk Management,* doi: 10.1111/jfr3.12226, 2016. See also: "Case study 2 - directive of the ministry of culture of 23 April 2015 "procedures for the management of activities for the safeguarding and protection of cultural heritage in the event of emergencies deriving from natural hazards" and its application in the event of national emergencies" and "Case study 8 - alerting system for securing the city of Florence's cultural assets in the flooding event of the Arno river" in PROCULTHER Project. Key elements of a European Methodology to Address the Protection of Cultural Heritage during Emergencies, Città di Castello: LuoghInteriori, 2021. ISBN 978-88-6864-370-6. [***https://www.procultherl.eu/wp-content/uploads/2022/06/PROCULTHER-Methodology.pdf***]

field. Notable examples include the national simulation of the Arno flood "Alluvione Arno 2006" in Florence and the international civil protection exercise TEREX 2010, on seismic risk, held in Lucca. In 2016, a first training course for volunteers focused on cultural heritage protection was organized in Lucca by local and regional authorities in collaboration with the National Civil Protection Department - DPC and the MIC. That same year, volunteers from Tuscany participated in emergency operations following the Central Italy earthquakes (2016 - 2017), marking the first coordinated deployment of regional civil protection resources for the rescue of cultural heritage.

On the same year, a Memorandum of Understanding was signed between the Civil Protection of the Tuscany Region, the Regional Directorate for Cultural and Landscape Heritage of Tuscany, and the Regional Volunteer Operational Committee.

The protocol was established with the aim of consolidating the numerous regional experiences in the protection of cultural heritage. One of the objectives of this Memorandum of Understanding is to create, within the CMRT, a mobile unit called "Cultural Heritage Intervention", specifically designed to operate in support of and under the supervision of MiC technical experts.

The Tuscany Region mobile unit equipped for the protection of cultural heritage

After the publication of the Decree-Law No. 50 of 2017, Tuscany participated in the call for funding to enhance its regional mobile unit, thereby ensuring follow-up to the intentions expressed in the afore mentioned protocol. The project was approved, and the establishment of the said mobile unit was subsequently carried out.

The objective of the cultural heritage mobile unit is to operate, when requested, within the regional territory or, if necessary, at the national level, with teams of volunteers specifically trained through courses organized in coordination with the three signatories of the Memorandum of Understanding. Where necessary, the National Fire and Rescue Service also intervenes in operations, such as do the Carabinieri Command for the Protection of Cultural Heritage (TPC)[6] to evacuate cultural assets from the restricted and most dangerous areas, transfer them, and temporarily store them in a designated storage warehouse.

Based on detailed assessments, the mobile unit was outfitted with a wide range of specialized tools and materials. These included refrigerated containers for the preservation of water-damaged books and archives, large gazebos for on-site operations, and heavy-duty vehicles such as vans and pick-up trucks equipped with civil protection fittings. The full list of resources includes:

a. **Vehicles:** A 35-quintals van with hydraulic lifts, four-wheel-drive trucks, a nine-seater van, and utility trailers.

[6] See in this issue: Lt. Col. Disibio L., "The role of the Carabinieri for the protection of cultural heritage in crisis areas: experiences in Kosovo and Iraq", pp. 18-24.

b. **Refrigerated containers:** ISO containers designed to maintain temperatures ranging from -30°C to +30°C, equipped with shelving for damaged materials.
c. **Emergency equipment:** Portable generators, radio communication systems, and protective clothing, including Tyvek® suits and nitrile gloves.

The planning and design stages of the mobile unit involved extensive collaboration among conservators, civil protection officials, and logistical experts. This initiative brought together the expertise of multiple institutions, including the Civil Protection of the Tuscany Region, the Opificio delle Pietre Dure of Florence, and the conservation workshop of the National Central Library of Florence. This multidisciplinary approach was essential to address the diverse challenges posed by emergencies.

The mobile unit operates following four operational phases:

A) Retrieval of damaged or endangered CH assets

This is the first phase of the activities in which the teams operate. It is a hazardous phase for personal safety, and the teams follow the instructions of the National Fire and Rescue Service, entering the "red zone" only if authorized by them. The operational phase involves removing cultural heritage assets from the "red zone" and transferring them to a safe area, as indicated by MiC officials.

Materials and equipment provided: personnel transport vehicles, minibus, pickup trucks, vans, appropriate personal protective equipment (PPE), spotlight lighting systems with suitable generators, etc.

4. The Regional mobile convoy © Tuscany Region

5. The refrigerated containers © Tuscany Region

B) Cataloguing and packing of rescued cultural heritage assets

This operational phase takes place just outside the "red zone", under a dedicated gazebo enclosed on all four sides, equipped with electrical and lighting systems, tables, and all necessary materials for cataloguing by MiC officers, with the support of trained volunteer teams. During the winter, the gazebo can be heated using hot air blowers.

The operational phase consists of packing the cultural heritage assets to ensure they are suitable and protected for transport to the storage location.

Materials and equipment provided: 4x4 m gazebo enclosed and ballasted, with electrical system and appropriate furnishings, as well as materials suitable for cataloguing and protective packing.

C) Transport of cultural heritage assets to the storage warehouse

The catalogued, packed, and protected cultural heritage assets are transported to the storage warehouse, using convoys escorted by law enforcement and under the supervision of the MiC.

Materials and equipment provided: vehicles for transporting personnel and packed cultural heritage assets, vans of various types and capacities, minibuses, and pick-up trucks.

D) Unloading cultural heritage assets at the storage warehouse

The final phase involves the teams providing support for unloading the cultural heritage assets and placing them in the storage warehouse, where they are temporarily stored after cataloguing and inventory.

Materials and equipment provided: cataloguing tools and various supporting materials.

Examples of deployments of the Tuscany Region mobile unit

Since its establishment, the cultural heritage mobile unit has been actively deployed in several major emergencies.

Recently, the mobile unit played a key role during the floods that struck Tuscany in November 2023 and March 2025. In November 2023, it was implemented in Campi Bisenzio, Quarrata, and Montemurlo to rescue and stabilize archival and library collections affected by water damage. Following the March 2025 flood, the unit operated at the Istituto Ernesto De Martino in Sesto Fiorentino to recover its archival holdings. These interventions, carried out in collaboration with the National Central Library of Florence and the Opificio delle Pietre Dure, showcased the unit's operational effectiveness within the regional network connecting conservation institutions and civil protection authorities.[7]

6. Rescue operations at Villa Moncalvo in Campi Bisenzio (Florence)
© Tuscany Region

7. Rescue of assets at the Archives of the De Martino Institute in Sesto Fiorentino (Florence)
© Tuscany Region

[7] See Capitani R., Cattaneo B., Galeotti M., Petrocchi D. Sidoti A., "The 2023 floods in Italy - A test of preparedness for libraries and archives", in *PROCULTHER-NET 2 Project. Technical Bulletin N. 5, July 2025*, pp. 61-68 [***https://civil-protection-knowledge-network.europa.eu/media/2023-floods-italy-test-preparedness-libraries-and-archives***] Accessed 25 October 2025.

Challenges and Lessons Learned

Despite their success, the mobile units faced several challenges that offered valuable lessons for future improvements:

1. **Resource allocation:** The diverse needs of cultural heritage preservation often required improvisation and adaptability. Future acquisitions should focus on expanding the range of available tools.
2. **Communication:** Effective coordination among stakeholders was critical but occasionally hampered by technical and logistical issues. Further and updated communication protocols are essential.
3. **Scalability:** Scaling the mobile unit's operations to address larger crises, both nationally and internationally, remains an ongoing challenge.

Future directions

To enhance its capabilities, the civil protection mobile units should prioritize the following areas:

1. **Integration of technology:** Advanced tools such as predictive analytics and GIS mapping can improve risk assessment and resource deployment.
2. **Expanded training programs:** Developing specialized modules for different types of cultural assets will broaden the unit's expertise.
3. **Policy advocacy:** Stronger institutional support and policy frameworks are needed to facilitate rapid mobilization and long-term sustainability.

Conclusion

The establishment of a civil protection mobile unit for cultural heritage in emergencies represents a significant advancement in disaster response capacity. By combining specialized resources, comprehensive training, and strategic planning, the initiative ensures the safeguarding of cultural assets during disaster and bridge the gap between immediate response and long-term preservation. Continued investment in equipment, personnel, and interagency collaboration will be vital to its sustained success and adaptability to future challenges.

The use of the modules developed in the Marche and Tuscany Regions during recent emergencies in Italy has made it possible to test and further improve the efficiency of their components. These two experiences set an example that hopefully will be followed by many other Regions in the coming years, so that within each Regional Disaster Response Buffer Capacity (CMR) there may be a dedicated component for the safeguard and protection of cultural heritage in emergencies.

Protecting cultural heritage in times of crisis: lessons from the 2021 floods in Belgium

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Introduction: Belgium's 2021 floods as a wake-up call for cultural heritage

Cultural heritage is increasingly recognised not only as a bearer of identity, but as a key resource for sustainability and resilience.[1] International frameworks and methodologies (UNESCO, ICCROM[2], ICOMOS[3], PROCULTHER[4]) emphasise its role in disaster risk reduction, yet national-level implementation remains inconsistent.[5] In Belgium, the 2021 floods exposed major vulnerabilities – over 250 heritage sites were affected (Fig. 1, 2, 3)[6], many lacking even basic emergency plans. No structure was in place for coordinated heritage rescue, leaving the sector without clear leadership. In this vacuum, the Royal Institute for Cultural Heritage (KIK-IRPA) assumed a de facto coordination role, despite having no formal mandate, as no specific regulation for the protection of heritage in times of crisis existed.

Since 2020, KIK-IRPA has strengthened its expertise and leadership in disaster risk management through initiatives such as the Federal Rescue Strategy for Science and Cultural Heritage (FEDERESCUE) (2020-ongoing) and the Cultural Heritage in Crisis (CHrisis) project (2022–2025)[7] (Fig. 4).

[1] UNDRR 2015, United Nations 2015, European Commission 2018.

[2] Tandon A., First aid to cultural heritage in times of crisis. 1 Handbook, for coordinated emergency preparedness and response to secure tangible and intangible heritage ICCROM and Prins Claus Foundation, Rome/Amsterdam, 2018 [***https://www.iccrom.org/publication/first-aid-cultural-heritage-times-crisis-handbook***] Accessed 23 October 2025.

[3] Labadi S., et.al., Heritage and the Sustainable Development Goals: Policy Guidance for Heritage and Development Actors, ICOMOS, Paris, March 2021 [***https://openarchive.icomos.org/id/eprint/2453/13/ICOMOS_SDGPG_2022%20-%20FINAL3.pdf***] Accessed 23 October 2025.

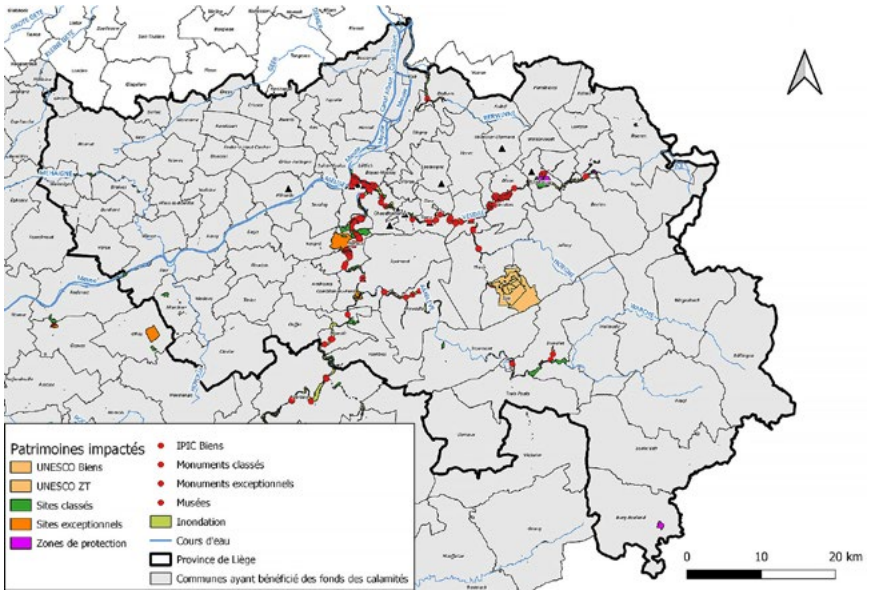
[4] PROCULTHER Project. Key elements of a European Methodology to Address the Protection of Cultural Heritage during Emergencies, Città di Castello: LuoghInteriori, 2021. ISBN 978-88-6864-370-6 [***https://www.procultther.eu/wp-content/uploads/2022/06/PROCULTHER-Methodology.pdf***] Accessed 23 October 2025.

[5] Beyl J., De Bruyn E., Boschloos V., Project beleidsvoorbereidend onderzoek met het oog op een rampenstrategie voor erfgoed in Vlaanderen en het tweetalig gebied Brussel-hoofdstad, KIK-IRPA/FARO/BSB, Brussels, 2025 (unpublished source).

[6] Marique L., Collanges F., *Responding to the July 2021 Floods in Belgium. Experience of the Cultural Heritage Sector 2021-2024*, KIK-IRPA, Brussels, 2025 (unpublished source).

[7] KIK-IRPA Sustainability Unit undated, Royal Institute for Cultural Heritage (KIK-IRPA), *Sustainability Unit* [***https://www.kikirpa.be/en/conservation-restoration/sustainability-unit***], KIK-IRPA, Brussels, undated.

These projects have advanced risk assessment, training, and emergency planning to better align heritage protection with broader humanitarian preparedness. This article, extracted from Bulletin 40 of KIK-IRPA[8], focuses on the key lessons from CHrisis and proposes recommendations to bridge the gap between policy and operational practice. It also complements earlier PROCULTHER publications on flood responses in Valencia[9], Mayotte[10], and Italy[11], offering a comparative perspective on managing heritage at risk in different national contexts.



1. Map of sites affected by the July 2021 floods in Liège Province. The affected sites are located along waterways that overflowed their banks. The map illustrates that heritage sites were impacted across several hundred kilometres, with Liège Province being the hardest hit © Brussels, KIK-IRPA

[8] De Bruyn E., Olbrechts A.-C., 2025, "From Lessons Learned to Integrated Crisis Management: The Impact of the July 2021 Floods on Belgium's Cultural Heritage", *Bulletin de l'Institut royal du Patrimoine* [***http://journals.openedition.org/kikirpa/7033***] ; DOI : [***https://doi.org/10.4000/145tb***] Accessed 28 July 2025.

[9] Blanco I. C., et al., "Rescue of movable assets and damage assessment after the 2024 floods in the Valencian Community" in *PROCULTHER-NET 2 Project. Technical Bulletin N. 5, July 2025*, pp. 42-53 [***https://civil-protection-knowledge-network.europa.eu/media/rescue-movable-assets-and-damage-assessment-after-2024-floods-valencian-community-part-1***] Accessed 23 October 2025.

[10] Courselaud M., et al., "Lessons learned from the response of Blue Shield France to Cyclone Chido in Mayotte", in *PROCULTHER-NET 2 Project. Technical Bulletin N. 5, July 2025*, pp. 54-60 [***https://civil-protection-knowledge-network.europa.eu/media/lessons-learned-response-blue-shield-france-cyclone-chido-mayotte***] Accessed 25 October 2025

[11] Capitani R., et al., "The 2023 floods in Italy - A test of preparedness for libraries and archives", in *PROCULTHER-NET 2 Project. Technical Bulletin N. 5, July 2025*, pp. 61-68 [***https://civil-protection-knowledge-network.europa.eu/media/2023-floods-italy-test-preparedness-libraries-and-archives***] Accessed 25 October 2025.

2. The devastating impact of the 2021 floods on archival collections (Regional Archive Liège Province) © State Archives in Liège

3. Churches were among the institutions most affected by the floods, suffering extensive damage to their collections and interiors: the severe impact on ecclesiastical textiles shows floodwaters rising inside the cabinet and receding, leaving most of the formerly white garments still hanging in place but completely saturated with mud © Brussels, KIK-IRPA

1. Methodology: from CHrisis RetEx to European standards

This paper is based on the CHrisis "Return of Experience" (RetEx) report[12], analysing how the heritage sector responded to the 2021 floods. It also draws on KIK-IRPA's Sustainability Unit projects (FEDERESCUE, Rampenstrategie, Internal Emergency Plans) and their findings on preparedness across federal institutions, Flanders, Brussels, and KIK-IRPA itself, while seeking alignment with European standards and methodologies (Fig. 4). Sources include site visit reports, archival documents, official reports[13], interviews, and expert meetings.[14] The analysis is structured using risk cycle[15]and helix models[16] (prevention, preparedness, response, recovery, evaluation) to ensure alignment with national and international frameworks. It addresses three questions: How prepared was the sector before the floods? How effective was the response and recovery? And how can international guidelines[17] be adapted to Belgium's context for improved crisis resilience?

[12] Marique L., Collanges F., 2025, *Ibidem*.

[13] Parlement wallon, Rapport de la Commission d'enquête parlementaire chargée d'examiner les causes et d'évaluer la gestion des inondations de juillet 2021 en Wallonie (894 (2021-2022), 1, 24 mars 2022 [***https://www.wallonie.be/sites/default/files/2022-11/Inondations%20rapport%20de%20la%20commission%20parlementaire.pdf***] Accessed 23 October 2025 ; Zeimetz F., et al., Analyse indépendante sur la gestion des voies hydrauliques lors des intempéries de la semaine du 12 juillet 2021. Lot 1 – factualisation. Rapport de synthèse, Stucky SA, Renens, 2021 [***https://www.wallonie.be/sites/default/files/2021-10/rapport_synthese_analyse_inondations_-_stucky_-_volet_1_-_11-10-21_.pdf***] Accessed 23 October 2025.

[14] The colleagues involved in these initiatives come in majority from: Agence wallonne du Patrimoine (AWaP), Association des archivistes francophones de Belgique (AAFB), Association royale des Demeures Historiques & Jardins de Belgique - Koninklijke Vereniging der Historische Woonsteden & Tuinen van België (DHJB-HWTB), Blue Shield Belgium (BBS), la Fédération Wallonie-Bruxelles (FWB), Musées et Sociétés Wallonie (MSW), Centre Interdiocésain du Patrimoine et des Arts Religieux (CIPAR), Commission royale des Monuments, Sites et Fouilles de la Région wallonne (CRMSF), ESA Saint-Luc, het Vlaams SteunpuntvoorCultureelErfgoed (FARO), MonumentenwachtVlaanderen, ICOM Belgique/Wallonie-Bruxelles (ICOM BWB), ICOM Belgium Flanders (ICOM BF), ICOMOS Wallonie-Bruxelles, IKOB, Museums of Verviers, National Archives and State Archives in the Provinces (State Archives), National Crisis Center (NCCN), Royal Museums of Art and History (KMKG-MRAH), Royal Institute for Cultural Heritage (KIK-IRPA), University of Liège (ULiège).

[15] Pursiainen C., *The Crisis Management Cycle London*, 2017 [***https://doi.org/10.4324/9781315629179***] Accessed 23 October 2025.

[16] Bosher L., Chmutina K., van Niekerk D., *Stop Going Around in Circles: Towards a Reconceptualisation of Disaster Risk Management Phases*, Loughborough University, s.l., 2021 [***https://hdl.handle.net/2134/14626062.v1***] Accessed 25 October 2025.

[17] Such as: Tandon 2018; De Masi et al. 2021; PROCULTHER 2021; European Commission 2021; European Commission 2022; Boccardi 2023.

4. Overview of the projects coordinated by the KIK-IRPA Sustainability Unit, and of the European networks and initiatives in which the unit is involved © Brussels, KIK-IRPA

2. Context: The 2021 Floods in Belgium and their impact on cultural heritage

Disaster management in Belgium operates at municipal, provincial, and national levels.[18] Cultural heritage, however, is not formally included in crisis coordination. Heritage responsibilities are fragmented across seven authorities (regional and federal) without hierarchical links[19], each using different tools for preparedness. No common framework exists for cross-regional crises.

At the federal level, three actors have long promoted heritage crisis readiness: KIK-IRPA[20], Blue Shield Belgium (BSB)[21], and the Cultural Properties Working Group of the Interministerial Commission for Humanitarian Law (CIDH).[22] Despite valuable efforts like awareness campaigns and early training, their work was marginalised before 2021. KIK-IRPA's renewed focus since 2020 led to initiatives like FEDERESCUE and internal emergency planning, although funding and mandate remain limited.

In Flanders, the FARO agency has supported first aid training and guidance since 2007.[23] A mutual aid depot network exists[24], but risk networks have weakened.[25]

Brussels has developed inventories and training efforts since 2019.[26] Additionally, FEDERESCUE, a network formalised in 2021, aims to protect personnel, visitors, buildings, and collections during disasters in Federal Scientific Institutions, coordinated by KIK-IRPA.[27] Most of these institutions are located in Brussels, with the exception

[18] "Koninklijk Besluit van 26 april 2024 tot vaststelling van het nationaal noodplan", in Belgisch Staatsblad 14 mei 2024, pp. 62403-62456 [***https://crisiscentrum.be/sites/default/files/documents/files/KB%20nationaal%20noodplan_AR%20plan%20d%20urgence%20national.pdf***] Accessed 23 October 2025.

[19] De Clippele M.-S., *Protéger le patrimoine culturel : à qui incombe la charge?* Bruxelles, 2020, [***https://books.openedition.org/pusl/26644***] Accessed 25 October 2025.

[20] Brussels, KIK-IRPA, Archives (1942-1945); Ministère de l'Instruction Publique and Ministère de l'Intérieur 1953; Coremans 1946; Coremans 1964.

[21] Serck-Dewaide M., "Le Comité belge du Bouclier Bleu, protéger le patrimoine en crise", in *Thema & Collecta*, *La gestion du risque en Belgique*, 7, 2020, ICOMOS Wallonie-Bruxelles, Brussels, 2020, p. 28-37.

[22] Commission interministérielle de droit humanitaire (CIDH), *La Protection des biens culturels en Belgique : quel(s) régime(s) juridique(s) appliquer ?* Brussels, 2007 [***https://cidh.be/fr/publications***] Accessed 25 October 2025.

[23] FARO. Vlaams steunpunt voor cultureel erfgoed, Erfgoedwijzer: Calamiteitenplan [***https://faro.be/kennis/calamiteitenplan***] s.l., undated. Accessed 4 November 2025.

[24] Flanders, Vlaamse Codex, Decreet betreffende het onroerend erfgoed, Belgisch Staatsblad 12 juli 2013 [***https://codex.vlaanderen.be/Zoeken/Document.aspx?DID=1023317&param=inhoud&ref=search***] Accessed 23 October 2025.

[25] Olbrechts A.-C., Brand, Brand, Vlaanderen klaarstomen voor een calamiteit, in Faro tijdschrift over cultureel erfgoed, 12 (2019), 4, p. 40-45. 2019; Beyl, De Bruyn and Boschloos 2025 (unpublished source).

[26] Leroy I., "Gestion des risques et protection du patrimoine en Région de Bruxelles-Capitale", in *Thema & Collecta*, *La gestion du risque en Belgique*, 7, 2020, ICOMOS Wallonie-Bruxelles, Brussels, 2020, p. 44-47.

[27] Belspo, *FEDERESCUE: Federal Rescue Strategy for Science and Cultural Heritage* [***https://www.belspo.be/belspo/fsi/federescue_fr.stm***] s.l., Accessed 23 October 2025.

of the Africa Museum, and they operate under the federal Public Planning Service Science Policy's (Belspo) oversight. Wallonia showed fragmented efforts despite multiple actors[28], and inventories remain decentralized.[29] None of the more than 250 affected institutions during the July 2021 floods had disaster-scale emergency plans. Informal responses, like moving collections to higher floors, were insufficient. There was no unified command; responsibilities were unclear, and roles improvised.

Since July 15th, 2021, actors like *Agence wallonne du Patrimoine* (AWaP), BSB, *Centre Interdiocésain du Patrimoine et des Arts Religieux* (CIPAR), and KIK-IRPA have taken independent action. BSB created a hotline for dispatching first aiders; and a "Crisis Committee" was established as of July 19th, coordinated by KIK-IRPA, uniting stakeholders across sectors. Fieldwork, fundraising, and data collection followed, but no central damage assessment tool existed. An ICCROM-supported tool remained largely unused, possibly because it required significant adaptation to field procedures or was deemed unnecessary for rapid assessments. Instead, shared Excel lists were used to coordinate information.

Recovery efforts revealed financial vulnerabilities, especially for small institutions. There was no emergency fund. Secondary damage (mould, salt, structural issues) required years of follow-up. Organisations like BSB, CIPAR, and KIK-IRPA continued interventions and research on treatment protocols under the CHrisis project.

The floods prompted new initiatives: ICOM and *Musées et Société en Wallonie* (MSW) trained museums and archives with the *Centre de Recherche et de Restauration des Musées de France* (C2RMF). CIPAR appointed new safety advisors. KIK-IRPA improved partnership with the National Crisis Centre (NCCN), became an official user of the PARAGON crisis-management software (developed by the NCCN and used by emergency services) and thus enabling its use for heritage-related emergencies, and conducted training with security services. Local exercises (e.g., ARTEX[30]) and cross-sector dialogue increased. BSB signed conventions with three provinces (Liège, Brabant-Wallon, Namur) out of ten, where it was integrated into the official emergency response system. Through funding, it also advanced its secretariat and volunteer network. However, integrating heritage into national crisis planning remains a work in progress.

[28] Delplancq T., "Pour une meilleure sensibilisation aux risques dans les archives locales en Belgique francophone", in *Thema & Collecta*, *La gestion du risque en Belgique, 7,* ICOMOS Wallonie-Bruxelles, Brussels, 2020, p. 37; Jacquet R., "Plan de sauvegarde et d'urgence en cas de catastrophe : une nécessité souvent négligée en Wallonie", in *Thema & Collecta*, *La gestion du risque en Belgique, 7*, 2020, ICOMOS Wallonie-Bruxelles, Brussels, 2020, p. 38-41.

[29] Wursteisen M., *Présentation de fin de stage. Réaliser un mapping des sites patrimoniaux impactés lors des inondations de 2021 en Belgique*, KIK-IRPA, Brussels, 2023 (unpublished source).

[30] Services du Gouverneur du Brabant Wallon, *« ARTEX » : la sauvegarde patrimoniale lors de situations d'urgence testée et approuvée en Brabant wallon* [**https://bwresponse.be/artex-la-sauvegarde-patrimoniale-lors-de-situations-durgence-testee-et-approuvee-en-brabant-wallon/**] Accessed 23 October 2025.

5. The designated treatment areas for drying both church archives and textiles: a coordinated response effort among BSB, KIK-IRPA, and CIPAR at a church in Fraipont © Brussels, KIK-IRPA

Response of the heritage sector: summary and timeline[31]

Immediate Actions (15-20 July 2021)

- **15 July**: Initial emergency response by heritage site managers; Blue Shield Belgium (BBS) received calls for assistance from museums in Liège and Verviers. A call for professional help (e.g., conservators/restorers) was issued to its members.
- **Starting on July 15th**: Individual, uncoordinated assistance by heritage experts, including staff from KIK-IRPA, FARO, State Archives, Royal Museums of Art and History, and private conservators, working voluntarily.
- **Starting on July 15th**: BBS launched a coordinated response, which included the establishment of a central emergency number for requests and volunteer coordination.
- **Building Safety Assessments**: Municipal and city building stability assessment engineers began evaluating buildings early due to potential collapse hazard, but often overlooked the heritage value of sites.

[31] Timeline of the heritage sector's response during the July 2021 Floods and afterwards, based on Beyl, De Bruyn, and Boschloos 2025.

- **Emergency Interventions**: Heritage experts from BBS, KIK-IRPA, CIPAR, AWaP, and private companies like IPARC prioritised immediate interventions. The lack of a standardised methodology limited formal evaluations of affected sites.
- **19 July**: KIK-IRPA issued invitations to form a crisis committee, leveraging its network to unite heritage organisations and experts.
- **20 July**: The first meeting of the crisis committee took place.

First Months

- **Crisis Committee**: Coordinated actions included sharing information about affected sites, organising volunteers, planning rescue missions, fundraising, and managing communication flows.
- **Access Challenges**: Obtaining critical information such as site accessibility, needs, and contact points proved difficult, along with sourcing intervention materials like protective equipment and packaging supplies. The initial resources were provided by KIK-IRPA and the State Archives, and later supplemented by BBS, Monumentenwacht, and other organisations.
- **Site Security**: Many sites lacked proper security, resulting in risks of theft and unauthorised access. Collaboration with KIK-IRPA, CIPAR, and BBS ensured the safe relocation of movable heritage to secure depots.
- **Heritage Assessments**: Formal evaluations commenced, although limited personnel restricted systematic assessments. Remote evaluations (via phone and surveys) became the primary method.
- **Collaboration**: Organisations such as CIPAR and AWaP shared assessment data with the crisis committee.

January to June 2022

- **Restoration Efforts**: Selected artworks were restored using funds from a dedicated fundraising campaign. Other heritage items were included in the CHrisis project for conservation studies and restoration protocols.
- **Funding Opportunities**: The Fédération Wallonie-Bruxelles launched calls for projects aimed at supporting the conservation and restoration of artworks, as well as community recovery initiatives.
- **Volunteer Support**: BBS continued to deploy expert volunteers to assist site managers with rescue operations.
- **Field Schools**: BBS co-organised field schools for conservation-restoration students from UAntwerp and ENSAV La Cambre, continuing through 2023.

November 2022

- **Launch of the CHrisis project and RetEx evaluation** (2022–2024). Interventions focused on rescue missions and monitoring the evolution of damage.

Until June 2023

- **Continued on-site interventions** by BBS, CIPAR, and KIK-IRPA.

3. Key lessons from the July 2021 floods: strengths, gaps, and structural needs

The July 2021 floods tested Belgium's cultural heritage sector's ability to manage large-scale crises, revealing both strengths and gaps. Thanks to prior experience, professionals from KIK-IRPA, BSB, CIPAR, and other organisations rapidly mobilised and addressed all phases of the risk cycle. The formation of a multi-stakeholder Crisis Committee was a key achievement, enabling coordination and communication across the sector. BSB's volunteer mobilisation offered a structured response framework. These experiences broadened the sector's emergency response capacity.

However, significant weaknesses became apparent. The cultural heritage sector was not formally included in Belgium's national crisis response mechanisms and lacked integration with emergency services. No formal representation in security cells meant heritage was not prioritised or included in strategic coordination. The absence of a national authority to steer operations led to fragmented responses at first, confusion among local services, and delayed interventions.

The sector also faced practical barriers: lack of accessible inventories or maps of heritage sites, limited reporting and assessment tools, and restricted access to essential logistics like transport and emergency storage. Coordination between actors remained informal, creating duplication of efforts and inefficient resource use. Financial mechanisms were slow and insufficient – crowdfunding covered only a very small part of the needs. Finally, there was no post-crisis evaluation framework. Although CHrisis contributed important initiatives, they remain isolated. A structural, permanent system is needed to sustain preparedness and post-disaster resilience.

4. Strengthening Belgium's cultural heritage resilience: key recommendations

Drawing on lessons from the July 2021 floods and European recommendations and methodologies, this paper proposes key measures to enhance disaster risk management for Belgium's cultural heritage. While further consultation is needed, the following draft recommendations can support policy discussions and operational reforms.

First, cultural heritage must be structurally integrated into Belgium's emergency planning at municipal, provincial, and federal levels. Closer cooperation between the heritage and crisis management sectors will strengthen coordination and ensure that cultural assets are considered alongside other critical infrastructure.[32]

Second, a national coordination mechanism is needed. Establishing a permanent Crisis Committee for Heritage, building on the temporary body formed in 2021, would improve communication, clarify responsibilities, and accelerate response. This committee would rely on a trained network of experts who can liaise with emergency services. A designated Single Point of Contact (SPOC) should be formally

[32] As stated in international studies: De Masi et al. 2021; PROCULTHER 2021; Boccardi 2023 p. 39; European Commission 2022 p. 9.

established within the national crisis response structure, with regional adaptations reflecting Belgium's institutional organisation, and with a clear division of responsibilities within the heritage sector itself.

Third, operational coordination should be reinforced. A unified mapping and real-time inventory system of heritage sites would enable faster and better-targeted responses. These tools must be linked to a clear damage assessment protocol, drawing on international frameworks such as PROCULTHER[33] or ICCROM's templates. Although available during the floods, such tools were underused and should be tested and adapted for Belgian use.

Fourth, preparedness must be improved through targeted training and knowledge-sharing. Training programs for both heritage professionals and first responders should be embedded into existing networks, such as FEDERESCUE or regional support centres. Regular simulation exercises would build capacity and enhance mutual understanding between sectors.[34]

Fifth, response logistics need strengthening. Belgium should invest in emergency stockpiles – containing packaging, evacuation materials, and drying equipment – as well as temporary storage sites to protect collections when disaster strikes. These resources must be accessible and included in emergency planning.

Finally, a dedicated emergency fund is essential. Quick-access financial mechanisms can prevent delays and enable timely interventions.[35] Recovery should also include systematic post-crisis evaluation and feedback into policy, ensuring continuous learning and resilience.[36]

These measures would facilitate Belgium's transition from ad hoc responses to a coordinated, long-term strategy for cultural heritage resilience.

Conclusion: building a framework for cultural heritage disaster preparedness in Belgium

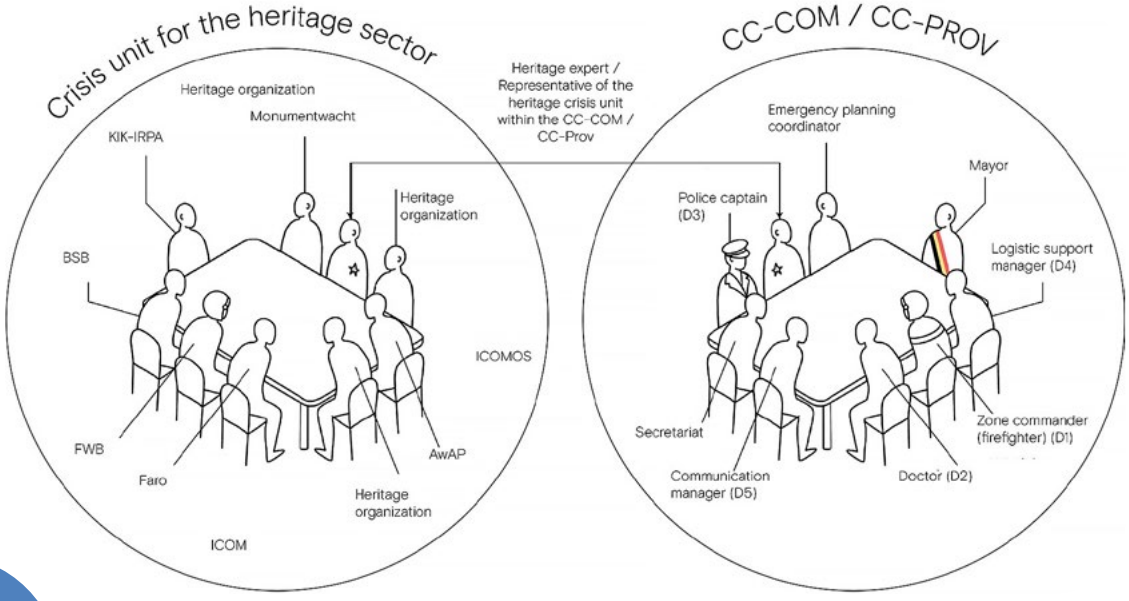
The July 2021 floods revealed urgent gaps in disaster preparedness for cultural heritage in Belgium. Institutions such as KIK-IRPA, BSB, CIPAR, and MSW proved their

[33] PROCULTHER Project. Key elements of a European Methodology to Address the Protection of Cultural Heritage during Emergencies, Città di Castello: LuoghInteriori, 2021. ISBN 978-88-6864-370 [***https://www.proculther.eu/wp-content/uploads/2022/06/PROCULTHER-Methodology.pdf***]

[34] Schmitz O., et al., *Witboek. Aanbevelingen tot verbetering van het crisisbeheer in België. Commissie van deskundigen inzake crisisbeheer* s.l., April 2023 [***https://www.ibz.be/sites/default/files/media/docs/witboek_vdef.pdf***] Accessed 23 October 2025.

[35] Minguez Garcia B., "Financing Disaster Risk Management for Cultural Heritage", in Routledge Handbook on Cultural Heritage and Disaster Risk Management, London, 2023.

[36] Casajus Valles A., M. Marin Ferrer, K. Poljansek, and Clark I. (ed.), Publications Office of the European Union, European Commission, Joint Research Centre, *Science for Disaster Risk Management 2020*, Luxembourg, 2021 [***https://data.europa.eu/doi/10.2760/438998***] Accessed 23 October 2025.



6. A diagram illustrating how the Crisis Committee for Heritage can be integrated into the coordination committees at the communal and provincial levels ensures the presence of a heritage expert in crises that affect heritage. The heritage expert is delegated by the Crisis Committee for Heritage and will be the sole contact point with emergency services, responsible for ensuring a smooth flow of information. This expert does not make decisions on behalf of others but can identify who should make the decisions and connect emergency services with the relevant ad hoc services © Brussels, KIK-IRPA

crucial role during the crisis and are well positioned to strengthen resilience moving forward. KIK-IRPA aims to act as a federal facilitator by linking heritage and crisis management through its scientific expertise and networks.

Future efforts must focus on establishing operational frameworks that integrate cultural heritage into disaster management policies. This requires close collaboration across all levels of government, including the National Crisis Centre (NCCN), and between heritage and emergency actors. Clear communication, structured roles, and sustained political will are essential. While the division of competencies adds complexity, the recent initiatives presented in this paper, as well as European projects and methodologies, provide valuable guidance and a promising foundation for lasting, systemic improvements in cultural heritage risk management.

Rescue of movable assets and damage assessment after the 2024 floods in the Valencian Community - part 2[1]

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Introduction

Emergency management in archives and libraries has been the subject of extensive study since the 1970s. Over the years, hundreds of monographs, articles, and studies have been published on emergency planning, management, and coordination, particularly regarding the recovery of several documentary sources affected by water, fire, or physical forces during disasters.[2] In addition, a considerable number of visual resources are available online documenting the various drying and stabilization methodologies implemented.

The approval of the Spanish National Plan for Risk and Emergency Management for Cultural Heritage in 2015[3], and its gradual integration into various government administrations, allowed for the implementation of numerous practical exercises, training courses, and drills.

These activities have been aimed at Civil Protection services, national security forces, the Army, and, especially, cultural sector professionals. In this context, the Valencian Regional Government through the Valencian Institute of Conservation, Restoration and Research (IVCR+i), has carried out various preparedness exercises focused on assessing damage to cultural heritage in emergency situations.

In this framework, it would not be an exaggeration to say that, when the devastating DANA disaster occurred in October 2024, the personnel involved were prepared to face

[1] See Blanco I., et al., "Rescue of movable assets and damage assessment after the 2024 floods in the Valencian Community" in *PROCULTHER-NET 2 Project. Technical Bulletin N. 5, July 2025*, pp. 42-53 [***https://civil-protection-knowledge-network.europa.eu/media/rescue-movable-assets-and-damage-assessment-after-2024-floods-valencian-community-part-1***] Accessed 28 October 2025.
[2] Tacón, J., *El secado de libros por empaquetado al vacío. Estudio de un caso práctico*, 2008. [***https://docta.ucm.es/entities/publication/c20f034b-645c-4aba-adca-be12be84ae50***] Accessed 28 October 2025
[3] Ministerio de Cultura, National Emergency and Risk Management Plan for Cultural Heritage, 2015 [***https://www.cultura.gob.es/planes-nacionales/dam/jcr:e57714b1-7a59-4e90-99d4-afb1f4285191/13-emergencias-y-gestion-de-riesgos-eng.pdf***] Accessed 28 October 2025

the situation. However, the magnitude of the catastrophe exceeded all expectations and, in some respects, challenged some of the acquired knowledge.

The initial difficulty in obtaining suitable working materials, coupled with the shortage of trained personnel available to carry out the interventions and the complexity of the tasks necessary to recover the material affected by exposure to the mud, required an adaptation of the intervention methodology.

1. Problems of stabilisation of the affected documentary heritage

Procedures previously developed, tested and validated by technical experts specialized in the recovery of water-damaged materials had proven effective in similar emergency situations.

However, in the Valencian case, these measures proved insufficient, slow, and even incompatible with the particular characteristics of the event. In particular, the freezing technique, universally used in flooding cases, proved unfeasible due to high medium-term economic costs.[4]

1. Picaña Court Archives © IVCR+i

[4] The magnitude of the disaster created conditions that rendered the use of freezers for the preservation of affected documents unfeasible: 1. Several towns were left without electrical power for extended periods, preventing the operation of refrigeration systems; 2. A significant portion of the industrial areas where the freezers were located was also affected. The units that remained operational were prioritized for ensuring the supply of essential goods to the population; 3. The need to transfer the documents to more distant locations further complicated the implementation of immediate preservation measures; 4. Adequate logistical support-such as specialized transport or cargo vehicles- was not available to ensure the safe transfer of the archives; 5. Outsourcing the freezing process to areas outside the affected zone would have substantially increased preservation costs; 6. Finally, the extraordinary volume of damaged documentation would have required the simultaneous use of multiple cold storage facilities, which proved unfeasible under the prevailing emergency conditions.

This aspect also affected the viability of freeze-drying, a technique that was immediately discarded, not only due to the lack of experience and specialized machinery in the region, but also due to the high cost associated with its implementation, which included transportation from the affected area, document preparation, freezing, re-transport to the freeze-drying chamber, processing, recovery, and reinstallation in the archive. In addition, there was a risk of loss of documentary control throughout the entire process.[5]

The possibility of using vacuum cycle drying was also considered, a methodology well documented in literature, but which required a high number of packaging machines and a constant supply of consumables that could not be ensured.[6]

The shortage of an adequate and continuous supply of blotting paper slowed the pace of absorbent material replacement, affecting process efficiency. Furthermore, this method involved additional labour costs, further reducing its effectiveness. After evaluating the available options, it was decided to adapt the methodology to optimize its application.

After conducting several tests, vacuum packing was reserved exclusively to the mitigation of deformations. This process consisted of locally moistening the binding and placing blotting papers interspersed with a hydroalcoholic solution both on the inside and outside of each volume.

Subsequently, the packaging phase helped eliminate the most severe deformations. After 24 hours of sealing, the volumes regained their shape in a high percentage of cases.

As the volume of damaged assets arriving at the Valencia Fair facilities increased exponentially, air drying was adopted as a stabilization measure, ruling out other alternatives, such as disassembling bound books. Air drying proved to be a simple, economical technique that was relatively effortless in terms of technical skill and labour time. On an area of 8,276 m^2, the following items were deposited for stabilisation: 2,244 books, 698 plans, 2,814 boxes of documentation, 65 paintings, 67 works from the Baron Vallvert collection, 128 works of contemporary art and 95 textiles.

[5] Freeze-drying could be considered a viable alternative; however, in this case, the documents contained a significant amount of mud and debris. Under such conditions, the application of this method would not lead to a reduction in costs. On the contrary, it would considerably increase them.

[6] Kaplan H. A., Ludwig K. A., *Efficacy of various drying methods*, 2005 [***https://www.archives.gov/preservation/conservation/drying-methods-01.html***] Accessed 18 April 2025; Silverman, A. et al, *Comparing Mass Drying and Sterilization Protocols For Water-Damaged Books*, 2007 [***https://cool.culturalheritage.org/coolaic/sg/bpg/annual/v26/bpga26-18.pdf***] Accessed 18 April 2025; Tacón, J., *El secado de libros por empaquetado al vacío. Estudio de un caso práctico*, 2008 [***https://docta.ucm.es/entities/publication/c20f034b-645c-4aba-adca-be12be84ae50***] Accessed 28 October 2025

2. Document drying at the Fair of Valencia © IVCR+i

The documents were kept open and, where possible, identified. Furthermore, they were placed horizontally to minimize the deformations often caused by the drying process. The contents of the boxes remained together, and only the unrecoverable bindings that seriously compromised the condition of the documents, by adding excess moisture, and hindering the drying process, were removed.[7]

One of the main issues observed with the increased volume of recovered assets was the difficulty in ensuring balanced and uniform drying, especially for the documents stored in boxes that formed blocks up to 35 cm thick.

The periodic turning of the boxes, due to the abundance and quantity of material to be dried, became increasingly sporadic and complicated, increasing the risk of biodeterioration. Given this situation, the documents were placed on eggcups, separating the objects contained in each box and stacking them horizontally.

This precaution allowed for maintaining documentary integrity of each box, promoting air circulation and reducing drying times, optimizing the available work surface, and improving the airflow generated by the fans.

[7] The use of egg trays as drying supports proved to be highly effective. Contrary to traditional methods-such as horizontal or fan-shaped arrangement, which caused significant deformations and required frequent handling-the egg trays allowed air circulation on both sides of the documents, preserving their structural integrity. This technique optimized space usage, reduced the need for personnel intervention, minimized the risk of dissociation, and significantly limited deformation, thereby accelerating the overall drying process.

Another significant challenge was the high concentration of mud in the documents. Because the archives remained submerged for several weeks, over time the fine suspended solids gradually weakened the structure of the boxes until they collapsed.

The paper absorbed the water through capillary action, but not the solid matter, which remained trapped at the edges of the documents, forming a block that prevented the paper from drying evenly. Removing this material while wet proved to be too aggressive, as the uneven edges made it difficult to safely remove the sludge. Ultimately, the decision was made to remove it once dry, using rolling motions and mechanical cleaning.[8]

In January 2025, Gir Controls S.L.U., a company specializing in technical services for Libraries, Museums, and Municipal Archives, donated the disinfection of the 8,276 m² workspace at the Fair of Valencia, as well as 76 aerosols (with GERMOSAN NOR BP1) for spot treatments in the archives of their respective municipalities. These aerosols were used in locations such as L'Alquería del Pi, home to the Rice Museum in Alfafar, an emblematic 17th century building that became a temporary repository for archives damaged by the flood, and in the vehicle used to transport archival material from Algemesí to the Fair.

3. Aspiration of spores generated by colonies of fungi © IVCR+i

[8] Recovery costs were driven by the emergency itself, not using egg trays. The documents were affected by mud as well as water, causing adhesion between pages. Freeze-drying would not have removed the mud and would have increased costs due to transport, freezing, and processing, especially since facilities are located hundreds of kilometers away.

Once the documentary collection was stabilized, it became necessary to establish as soon as possible the priorities for its recovery. Since these are primarily administrative documents, archivists must apply appropriate retention criteria. Restoration will only be carried out for documents of particular relevance, such as those of historical or essential value. For most assets, the process consists of removing mud, separating sheets of paper, cleaning solid remains using smoke sponges and vacuum cleaners, and smoothing the documents by vacuum packing them. Finally, the documents will be digitized for future reference and use.

Furthermore, the axenic collection of samples will allow for a genetic study of the fungi present during the DANA catastrophe, that will facilitate the corroboration of previously made morphological identifications.

The results obtained will contribute to the development of an initial catalogue describing the diversity of fungi that can develop under the specific conditions generated during the Valencia DANA in October 2024. This catalogue will become a reference tool for future studies and preventive measures related to fungal proliferation in similar contexts.

2. Activation and response in the National Plan for Risk and Emergency Management for Cultural Heritage: strategies and implementing protocols

The National Plan for Risk and Emergency Management for Cultural Heritage, approved by the Heritage Council in 2015 and coordinated by the Spanish Ministry of Culture, is a reference tool for the shared management of cultural heritage in emergency situations, involving various administrations and departments. Its main objective is to coordinate the efforts of the responsible entities to develop knowledge and establish alliances to address risks that could compromise the integrity of cultural heritage in disaster situations.

After the passage of the DANA, the Ministry immediately offered its Plan to the Generalitat Valenciana (GVA) to help in the recovery of the cultural heritage. Once the basic needs had been dealt with, GVA Generalitat began inspections and accepted the collaboration. Thus, a support team was activated and worked for five weeks starting on 19 November. The operation involved nearly 30 volunteer technicians, mainly from the Ministry of Culture, but also included specialists from the Institute for Cultural Heritage and the Region of Murcia.

The areas of collaboration of the deployed technicians focused on two key aspects: the supervision, evaluation, and diagnosis of damage to the built heritage, and support in the evacuation and stabilisation of documentary collections. This last area undoubtedly represented the greatest challenge in terms of resources for the Ministry, since, in addition to facilitating the travel of specialists, essential materials and equipment were provided for the initial stabilisation and drying tasks, all financed from its own budget. This contribution was particularly demanding due to logistical difficulties and the market shortage of certain products intended for drying documents and heritage assets.

The assistance was always provided according to the methodology and work plan established by the Valencian community, recognizing it as the competent authority and with direct knowledge of the specific needs of the affected territory. This collaborative effort ensured that the actions were aligned with local priorities and implemented carefully according to the protocols previously defined by the Valencian community, ensuring coordinated, efficient and respectful response with the local authorities of each affected area. Cooperation between the various institutions allowed for the optimisation of resources and maximum effectiveness of interventions, respecting the established responsibilities and roles, and ensuring that cultural heritage was cared for in accordance with the best available practices and technical criteria.

3. Towards a new approach to post-emergency management: Master Plan

4. Technicians from the Ministry of Culture and IVCR+i developing strategies for the Master Plan
© IVCR+i

The IVCR+i will coordinate the Master Plan[9] for action on movable assets, which will consist of two distinct parts: on the one hand, the necessary actions on the GVA collections, and on the other, the needs of the assets of the affected municipalities.

Regarding the first, IVCR+i will work in coordination with the GVA Museum Consortium, since most of the affected works are by living artists, who will need to be consulted regarding the intervention. Once this information is obtained and, following the preparation of the conservation status reports and the necessary intervention proposal, the relevance and priorities of the intervention plan will be evaluated with the highest authorities of the Regional Ministry, since resources, and above all, the time for intervention, are limited.

Regarding the actions on the cultural assets of the affected municipalities, in the case of libraries, except for the old collections, the use of resources

[9] A Master Plan is a strategic document that defines the guidelines for the planning, management, and development of a project, institution, territory, or specific area in the medium or long term. It serves as a guide for decision-making, establishing objectives, priorities, action phases, and intervention criteria.

for their recovery was rejected.

In the case of archives, priority will be given to those with the most relevant documentation, such as the archive of the Spanish Rice Union Federation (Alfafar Municipal Archive); parish archives, due to the importance of this documentation in municipalities like Sedaví, where the administrative documentation was completely lost during the flood; and judicial archives with "live" documentation containing essential data on the inhabitants of these areas.

In addition, among the remaining institutional archives, those containing the most significant items for the municipality will be assessed, namely the documents from the 1957 flood in the Aldaia municipal archive, for inclusion in a post-rescue intervention phase.

In the Master Plan, one of the priorities will be restoring the use of places of worship, especially the Picaña church, where the effects of the flood were devastating and the church was closed days after the disaster due to the proliferation of microorganisms in the altarpieces. For this reason, disinfection of this movable asset will be one of the first measures to be implemented. This treatment could not be applied previously due to the need to wait for the ambient humidity levels to drop to adequate and effective values for the treatment.

Another group of assets to be considered in the Master Plan will be the inventoried works of the GVA and the emblematic and most cherished works in each municipality. These reasons will be considered fundamental in establishing the course of action, beyond their historical and artistic value.

This Plan will design strategies and lines of collaboration with other Autonomous Communities for the possible intervention of some assets and, above all, with the Ministry of Culture for such notable elements as the 17th century textiles from the Basilica of San Jaime in Algemesí or the murals on the RUA in Aldaia[10], among others.

Conclusion

The experience of rescuing documentary heritage, which included more than 2,500 books and approximately 3,000 boxes of documentation from various archives, has allowed to identify and validate effective conservation strategies in emergency situations. The use of eggcup boxes, combined with forced ventilation systems, has proven to be an efficient methodology for treating large volumes of affected materials. In contexts with limited specialized personnel, the application of simple techniques has been not only feasible but highly effective, allowing the intervention of non-expert personnel sensitive to heritage conservation.

[10] RUA is a journey through a series of artistic works located in the streets and squares of Aldaia, created by artists from different parts of the world [***https://rua.aldaia.eu/en/home-en***] Accessed 28 October 2025.

Furthermore, it has been shown that separating the blocks using cardboard supports significantly accelerates the drying process. Once the accumulated moisture was reduced, fan drying, which initially presented problems due to warping of the bindings, proved to be an effective method for accelerating the drying of the book body, also facilitating page separation.

Vacuum drying, although not applicable in the initial phases due to logistical and personnel limitations, was successfully implemented in later stages, with drying agents changed every three hours. This method allowed for complete moisture removal within 48 to 72 h, depending on the thickness of the volumes. For specimens with significant deformations, traditional weight-smoothing techniques were applied, as well as vacuum packaging with humidity control using a hydroalcoholic solution, significantly improving flatness after drying (24/48h).

Regarding the long-term preservation and accessibility of documentary collections, the importance of removing surface mud using specialised tools and vacuuming pages affected by microorganisms clearly emerged. Furthermore, the preventive application of hydroalcoholic solutions is recommended to inhibit the proliferation of harmful biological agents.

A key finding was the remarkable resilience of the paper, as even after four months of exposure to extreme conditions (humidity exceeding 200% of the original weight and microbial growth), full volumes were recovered using the described procedures.

This experience has highlighted the difficulties many local authorities face in complying with international guidelines on the location and preservation of archives, due to administrative and political restrictions. However, improving the location of documentary collections and thus their preservation conditions is essential to preserve the historical memory of municipalities and their inhabitants.

Finally, the National Emergency and Risk Management Plan for Cultural Heritage has established itself as a key tool, promoting collaborative and cooperative management among administrations. This inter-institutional cooperation is essential to provide rapid, effective, and coordinated responses to disasters, thus ensuring the protection of cultural heritage.

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