THEMATIC REPORT

CONSERVATION OF FORTIFIED ARCHITECTURE AND ARCHAEOLOGICAL RUINS

CASTLE OF BASHTOVA
CASTLE OF ISHEM
CASTLE OF LEZHA
RUINS OF ST MARY CHURCH
VENETIAN TOWER



Funded by the European Union

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Cover Photo Caption

Through the loophole - Castle of Bashtova

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Foreword

The *EU4Culture Thematic Report Series* has been developed by UNOPS to document and share the experience and lessons learned from the conservation works implemented under the EU4Culture programme. This Series aims to serve as a professional resource for those engaged in the field of cultural heritage conservation, contributing to knowledge exchange and the continuous advancement of conservation practices in Albania and beyond.

The *EU4Culture Thematic Report Series* includes:

1. Conservation of the "Shqipëria" Mosaic on the Façade of the National Historical Museum
2. Conservation of Wall Paintings
3. Handling Artefacts
4. Conservation of Fortified Architecture and Archaeological Ruins
5. Conservation of Engineering Works and Historic Residential Dwellings
6. Restoration of the National Puppet Theater and the Building of the Formerly Persecuted

The EU4Culture programme, funded by the European Union and implemented by the United Nations Office for Project Services (UNOPS), was launched in the aftermath of the 2019 earthquake, which caused significant damage to cultural heritage sites and monuments in Albania. While conceived as a heritage recovery initiative, its objectives extended beyond the conservation and restoration of damaged sites. By improving the physical condition, accessibility, safety, and interpretive value of cultural monuments, the programme sought to enhance public understanding and appreciation of Albania's cultural heritage, attract more visitors to restored sites, strengthen their role as tourism assets, and contribute to local socio-economic development. The programme also placed strong emphasis on capacity building, fostering a lasting sense of stewardship and supporting the continued preservation and sustainable use of Albania's cultural heritage.

The EU4Culture programme, running from October 2020 to June 2026, was carried out in close collaboration with the Ministry of Tourism, Culture and Sport[1], as well as its subordinate institutions — including the National Institute for Cultural Heritage and the Regional Directorates of National Culture in Tirana and Shkodra.

1. Formerly Ministry of Culture (2020–2024), and Ministry of Economy, Culture and Innovation (2024–2025)

Cooperation also extended to the Municipalities of Durrës, Kavaja, Lezha, Kruja, Kurbin, Rrogozhina, and Tirana ensuring a locally grounded and inclusive approach to heritage conservation.

Recognizing the importance of capacity building, the project established a strong link with academic institutions, notably the University of Tirana (Department of Archaeology and Cultural Heritage Management) and the Polytechnic University of Tirana (Faculties of Architecture and Civil Engineering). These partnerships enabled young professionals and students to engage directly in fieldwork, transforming ongoing conservation activities into valuable platforms for experiential learning.

In total, the EU4Culture programme engaged 14 licensed conservation contractors, two multidisciplinary design companies, one supervision firm, and one commissioning company. The conservation and restoration interventions alone accounted for approximately 70,000 working days, representing the daily efforts of around 70 professionals from diverse disciplines and contributing to the timely and high-quality completion of the works.

Through this collaborative effort, 19 cultural heritage assets across Albania were restored, while four were equipped with the tools and equipment needed to support improved conservation, documentation, and operation. The outcomes, methodologies, and insights gained from these interventions are presented in a series of six thematic reports, each focusing on a different typology of conservation work: mosaic conservation; wall paintings; artefact handling; fortified architecture and archaeological ruins; engineering works and historic residential dwellings; and the restoration of selected public heritage buildings.

Read together, the six publications offer a comprehensive record of the EU4Culture programme's technical approach and practical lessons learned. They reflect not only the tangible achievements of the programme, but also the collective dedication of all those who contributed to its implementation — from national and local institutions, conservation professionals, designers, contractors, supervisors, academics, students, and community representatives, to the many individuals who supported the works on site. Their commitment, expertise, and collaboration were essential to safeguarding and celebrating Albania's cultural legacy.


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IN NUMBERS

Months taken for Implementation

Castle of Bashtova	31
Castle of Ishem	8
Castle of Lezha	4
Ruins of St Mary	13
Venetian Tower	12

Material approvals:

Castle of Bashtova	31
Castle of Ishem	2
Castle of Lezha	7
Ruins of St Mary	8
Venetian Tower	44

Number of approvals received:

Castle of Bashtova	3
Castle of Ishem	1
Castle of Lezha	2
Ruins of St Mary	2
Venetian Tower	3

Workforce for implementation

Castle of Bashtova	2852 Labour Days
Castle of Ishem	1503 Labour Days
Castle of Lezha	98 Labour Days
Ruins of St Mary	308 Labour Days
Venetian Tower	1839 Labour Days

Workforce for design

Castle of Bashtova	550 Labour Days
Castle of Ishem	300 Labour Days
Castle of Lezha	300 Labour Days
Ruins of St Mary	300 Labour Days
Venetian Tower	300 Labour Days

Workforce for supervision

Castle of Bashtova	1348 Labour Days
Castle of Ishem	348 Labour Days
Castle of Lezha	174 Labour Days
Ruins of St Mary	565 Labour Days
Venetian Tower	783 Labour Days

Financial investment

Castle of Bashtova	85,231,304.84 ALL (878,794 EUR)
Castle of Ishem	64,827,092.65 ALL (668,413 EUR)
Castle of Lezha	8,083,483.76 ALL (83,346.4 EUR)
Ruins of St Mary	38,979,975.65 ALL (401,911 EUR)
Venetian Tower	82,114,502.00 ALL (846,658 EUR)

1. Introduction

1.1 Purpose of the thematic report

The conservation of fortifications and archaeological ruins is inherently complex, because it requires balancing structural stability, historical authenticity, and long-term preservation in environments that are often fragile and exposed. Unlike conventional buildings, these sites frequently contain weathered stone masonry, missing structural elements, and layers of cultural significance accumulated over centuries. Their deterioration is accelerated by environmental factors such as moisture, vegetation growth, seismic activity, and temperature fluctuations, all of which must be carefully assessed and mitigated. Conservation interventions must be minimal, reversible where possible, and fully compatible with original materials, often requiring specialised craftsmanship and scientific analysis.

Additionally, archaeological contexts demand strict protection of stratigraphy and artifacts, meaning that any physical intervention must be preceded by careful excavation and documentation. Access constraints, uneven terrain, and safety risks further complicate the work. Overall, preserving fortifications and ruins calls for a multidisciplinary approach—integrating engineering, archaeology, materials science, and heritage conservation—to ensure that these irreplaceable sites are stabilised, understood, and safeguarded for future generations.

This thematic report encompasses a comprehensive examination of conservation efforts undertaken across five significant Albanian heritage sites: the Castle of Bashtova , the Castle of Ishëm, the Ruins of St. Mary Church, the Castle of Lezha, and the Venetian Tower. Together, these monuments represent a diverse spectrum of architectural typologies, historical periods, and conservation challenges, from coastal fortifications vulnerable to erosion and seismic activity, to archaeological ruins requiring meticulous documentation and stabilisation.

The scope of this thematic report includes an analysis of each site's historical context, architectural characteristics, pathologies, and the technical interventions implemented to address structural degradation, material loss, and environmental exposure. Emphasis is placed on the application of international conservation principles, the use of compatible materials, and the balance between preserving authenticity and ensuring long-term stability. By presenting the methodology, findings, and outcomes of these interventions, the thematic report provides a holistic narrative of Albania's ongoing commitment to safeguarding its fortified and archaeological heritage.

1.2 Objectives of the conservation work

The conservation interventions across theCastle of Bashtova, the Castle of Ishëm, the Ruins of St. Mary Church, the Castle of Lezha, and the Venetian Tower were guided by a shared set of objectives aimed at safeguarding their historical, architectural, and archaeological significance.

- Emergent stabilisation of critical portions
- In cases where a full conservation cannot be implemented, the intervention would be limited to loose or portions risking collapse
- Stabilise and repair existing deterioration
- Stabilisation and consolidation of structural elements weakened by time, environmental exposure, seismic activity, or previous incompatible interventions.
- Preservation of authenticity
- Preserving the authenticity and integrity of each monument through the use of compatible materials and reversible techniques, ensuring minimal alteration to original fabric while enhancing resilience.
- Mitigation of ongoing deterioration
- Thorough repair while addressing issues such as moisture infiltration, erosion, biological growth, and material disintegration.
- Protecting and enhancing archaeological values
- Ensuring proper documentation, interpretation, and safeguarding of buried or exposed remains.
- Improvement of visitors' safety
- The conservation efforts intended to improve visitor safety and accessibility without compromising the monuments' heritage character.
- Upgrading assets for their usage
- In cases where the space allows and the systems can be added without endangering the historical value, the sites should be conserved so that they can be used.
- Supporting long-term sustainable management

Interventions aimed to support the long-term sustainable management of the sites by establishing management frameworks and strengthening local stewardship capabilities. Together, these objectives contribute to the enduring preservation and meaningful public appreciation of Albania's fortified and archaeological heritage.

1.3 Importance of the sites

The Castles of Bashtova and Lezha, the Ruins of St Mary Church and the Venetian Tower (as a part of Durrës Castle) are designated monuments of culture of first category

following a number of decisions including: Decision of the Institute of Science (published in Official Gazette in 1948); Decision of the Rectorate of the Scientific University in Tirana in 1963; and Decision of the Ministry of Education and Culture in 1973. The Castle of Ishëm was designated a monument of first category by the decision of the Ministry of Education and Culture in 1977.

This designation guides the conservation intervention. Namely, for first category monuments no changes nor additions are allowed either to interior or exterior. involving the consolidation of the existing structures and the conservation of internal and external finishes. All elements defined as authentic must be preserved or restored exactly in the same way as built, using the same materials and techniques of repair.

2. Description of the buildings and previous restoration interventions

2.1 The Castle of Bashtova

The Castle of Bashtova is a 15th-century fortification constructed on the flat agricultural plains of Rrogozhina, approximately 400 meters north of the Shkumbin River and a few kilometers from its outlet into the Adriatic Sea. Historically, the region functioned as a river port and grain-exporting hub. The castle exemplifies late medieval defensive architecture built with stone masonry and strategically arranged towers. Its rectangular plan (60 × 90 meters) includes round and rectangular corner towers and mid-wall towers, with walls reaching up to 9 meters in height. The interior and exterior façades retain traces of guard paths, arches on pilasters, arrow slits, and remnants of battlements. Over time, structural distress — including vertical and diagonal cracking, loss of masonry, moisture infiltration, and biological growth — has become evident, exacerbated by unstable soil, flooding, and seismic events, such as the 2019 earthquake.

2.1.1 Previous Restoration Interventions

A series of conservation and repair campaigns were carried out between 1975 and 1990. These interventions focused mainly on structural consolidation, vegetation removal, and partial reconstruction of architectural elements. Between 1975 and 1990, the Castle underwent a series of conservation and restoration interventions aimed at stabilizing



Photo Caption: Castle of Bashtova

its deteriorated structures and recovering damaged architectural elements. In 1975, works included clearing vegetation from the walls, excavating accumulated soil along the western wall, and reinforcing and filling cracks in the towers. By 1985, efforts expanded to façade and tower restoration, reconstruction of battlements with arrow slits between Towers II and III and between Towers III and IV, completion of brick arches, and restoration of access stairs along with leveling of the guard passage. In 1986, further vegetation was removed, brick vaulting was restored, and battlements were resurfaced using antique bricks. The 1987 campaign concentrated on the northern section of the east wall and the rectangular tower, repairing battlements, leveling the guard path, and adding stone paving. In 1988, Tower A was restored through consolidation and completion of battlements and the addition of waterproof layers over the masonry crowns. Works in 1989 addressed the north section of the east wall and Towers 1, 3, and 7, restoring internal staircases, reinforcing brick arches, reconstructing upper entrances with timber lintels, and partially rebuilding battlements. The final phase in 1990 focused on the wall between Towers 6 and 7, including leveling the guard path, consolidating parapets, and conducting general cleaning both inside and outside the castle walls.

These interventions were mostly conservative in approach, aimed at stabilizing damaged elements, reinstating defensive architectural features, and slowing deterioration.

2.2 Castle of Ishëm

TheCastle of Ishëm is a 16th-century fortified structure, built between 1572 and 1574 on a dominant hillside overlooking the Ishëm plain, the river delta, and the Adriatic coastline. The Castle follows a rectangular plan of approximately 100 × 40 meters, defined by stone-masonry perimeter walls 1.2–1.5 meters thick and originally up to 7 meters high, reinforced with five towers of varying forms—circular, pentagonal, and rectangular. Because of its strategic position, in the past, the Castle of Ishmi served as an important Ottoman defense stronghold which served to control and protect the roads from the insurgents and prevent unauthorised trade with the Venetian Republic.

It is also worth noting that one of the most important and influential Albanian painters, Ibrahim Kodra, was born in Ishëm. His grave is located opposite to the entrance of the Castle.

Photo Caption: Castle of Ishëm







2.2.1 Previous Restoration Interventions

Throughout the 1980s and early 1990s, the Castle of Ishëm underwent several restoration and consolidation campaigns aimed at stabilizing its deteriorating masonry and addressing structural risks. The 1982 interventions focused on extensive cleaning of walls and towers from vegetation, clearing soil from the castle's interior and exterior perimeter, and relieving soil pressure particularly between Towers 2 and 3, where wall deformation had begun. Consolidation works were carried out on Towers 1, 2, 3, and 4, including the construction of stone basements beneath weakened walls, reinforcement of damaged sections, and the addition of a support wall on the south side of Tower 4. In 1983, works continued due to the increasing risk of collapse along the southwest wall, which required excavation of a drainage channel to reduce water pressure and improve wall stability. This phase also involved raising and repairing the front walls of Towers 3 and 5, reopening drainage ducts, cleaning vegetation, and removing soil accumulation along the northeast wall. The final documented campaign in 1991 targeted critical structural failures, including the consolidation of the southern wall of the circular southeast tower, the reinforcement of tower foundations and weakened perimeter wall sections, and the restoration of the main entrance gate. Additional works included repairing vertical cracks in the circular tower, removing intrusive vegetation, and relieving the northern walls from internal soil buildup. Collectively, these earlier interventions focused on emergency stabilisation rather than comprehensive conservation, leaving many unresolved structural and material issues that required renewed and more systematic treatment.

2.3 Castle of Lezha

The Castle of Lezha is a monumental hilltop fortification rising 186 meters above sea level on the eastern side of the modern city of Lezha, offering panoramic views over the Lezha plain, the Drin valley, and the Adriatic coastline. The site reflects continuous occupation from the 4th century BC through the Middle Ages, with fortification phases belonging to the Illyrian city of Lissos, followed by Byzantine, Venetian, and Ottoman periods. The earliest structures—visible mainly on the eastern and northern edges—consist of large polygonal and trapezoidal stone blocks laid in dry masonry, characteristic of Hellenistic defensive walls. Superimposed on these ancient foundations is the medieval castle, built with smaller well-jointed stones and architectural elements such as vaults, alcoves, buttresses, and gun turrets. The medieval fortification has a trapezoidal plan, reinforced by towers placed along corners and mid-wall points, enclosing three historic gateways aligned east, west, and north. The surrounding walls typically reach about 6 meters in height, adapting to the steep and irregular topography of the hill.



Photo Caption: Castle of Lezha

The castle's current appearance shows a settlement composed of layered historical phases, collapsed sections of masonry, and standing defensive walls integrating ancient Illyrian basements with medieval superstructures. In particular, the northern area contains some of the most significant archaeological evidence of the site's evolution, including the remains of the polygonal wall, a circular ancient tower, and medieval additions constructed directly above earlier structures. The visible masonry typologies, coupled with stratified architectural remains, make Lezha Castle a rare example of multi-period fortification development spanning more than two millennia.

2.3.1 Previous Restoration Interventions

Lezha Castle has undergone several restoration and consolidation interventions over time, particularly in response to the structural vulnerabilities of the ancient and medieval walls. The report notes that the fortification's northern sector—where the ancient polygonal wall and the medieval rectangular tower meet—has historically presented the most serious structural problems. These issues have been documented in multiple inspections and

earlier restoration projects, which have consistently highlighted cracking, inclinations, and destabilisation of masonry due to soil pressure, inadequate foundations, or past seismic activity. One of the clearest indicators of past interventions is the reinforcement of the northern tower with metal vaults, carried out by the Institute of Cultural Monuments, which has contributed to the tower's survival despite continuing structural challenges. These restorations form part of a broader historical pattern of attempts to consolidate the medieval walls built over ancient substructures, where instability frequently arises due to mismatched foundations or voids within the underlying masonry.

2.4 Ruins of St Mary Church

The Church of St. Mary in Mamurras is believed to have originated between the 11th and 14th centuries. Set on the southern slope of a hill within a dense cypress forest, the monument once formed part of a larger ecclesiastical ensemble, including the church, surrounding walls, front and rear squares, and a bell-tower positioned on a natural rock outcrop. The building underwent three major construction phases, evolving from a single-nave stone church to a three-nave basilica distinguished by arcades on pilasters, a semicircular apse with frescoes, and Romanesque-Gothic influences visible in window forms and sharp arches.

Photo Caption: Ruins of St Mary Church



Today, the site survives only as ruins. Portions of the eastern wall and central apse remain the most prominent features, preserving valuable traces of medieval frescoes. The north wall stands at near-original height, while the south, west, and nave walls are fragmented, partially collapsed, or missing. The structural masonry consists of irregular limestone blocks bonded with lime mortar, with pumice stone used in various sections. The building lacks its original floor—excavations reveal soil accumulation, fallen stone debris, and earlier grave structures within the nave.

Despite its deteriorated condition, the Church of S. Mary remains one of the most architecturally and historically significant medieval ecclesiastical sites in the Kurbin region, uniquely combining stratified construction phases, rare mural remnants, and a powerful natural landscape setting.

2.4.1 Previous Restoration Interventions

The Church of St. Mary has undergone several past restoration and conservation interventions, all of which were limited in scope and primarily aimed at stabilizing the surviving ruins rather than reconstructing the historic structure. Early interventions focused on general cleaning, including clearing accumulated stone debris and vegetation that threatened the fragility of the masonry walls. One of the most significant actions was the installation of a temporary roof over the altar/apse area, designed to protect the surviving medieval frescoes from further weathering and moisture damage. Additional conservation efforts included the partial consolidation of standing walls, where local failures or disintegration of mortar were addressed to slow deterioration.

More systematic documentation and archaeological work took place in 1985, when specialists from the Institute of Cultural Monuments conducted excavations and surveys, expanding understanding of the building's multiple construction phases and uncovering architectural elements belonging to its basilica period . In the early 2000s, a further conservation project was prepared (2002), aimed at improving the longevity and visitor appeal of the ruined church, reinforcing earlier observations about the need to safeguard both the basilical plan and the remains of mural paintings.

Collectively, these past interventions were conservative and protective, focusing on limited stabilisation, documentation, and short-term environmental protection. However, no comprehensive structural consolidation or long-term preservation strategy had ever been implemented, leaving the monument exposed to progressive decay and making new interventions essential.



2.5 Venetian Tower

The Venetian Tower is a distinctive circular fortification forming part of the Byzantine fortress of Durrës, a defensive complex whose origins date to the 6th century, during the Eastern Roman Empire. The tower sits on the southwestern segment of the historic city walls, an area long recognised as one of the most powerful military fortifications along the Adriatic coast during the Middle Ages. Architectural evidence and historical data show that the structure was rebuilt in the first half of the 15th century, during the period of Venetian rule, when advancements in artillery required new forms of military architecture, including specialised round towers adapted to cannon fire.

The tower rises from a conical stone pedestal and has a 9 m diameter and 9.6 m height, built in mixed stone and brick masonry, with façades clad in stone tiles of varying dimensions. It originally formed a three-level interior organisation: a high ground floor used for storage, a second floor with embrasures for artillery, and a vaulted third level supporting an exterior fighting platform enclosed by battlements .

Architecturally, the tower incorporates five turrets, arched openings, wooden-framed windows with iron grilles, and a system of narrow interior stairs leading to the upper platform. The base contains stepped stone foundations that follow the natural terrain of the hillside, characteristic of late medieval defensive construction.

Positioned near the coastline and adjacent to important archaeological and historical landmarks—including the Byzantine walls, museums, and the historic urban fabric—the Venetian Tower serves as a prominent visual and cultural focal point within Durrës. Despite later transformations, including its temporary adaptation as a bar, the tower remains one of the best-preserved monuments of the city's fortification system, retaining significant architectural, historical, and military value.

2.5.1 Previous Restoration Interventions

The Venetian Tower has undergone several restoration and reconstruction campaigns, primarily aimed at stabilizing its deteriorated masonry and adapting the monument for continued use. Early interventions focused on rebuilding collapsed portions of the structure, including the upper vaulted level and the perimeter of the battlements, which had suffered substantial degradation due to weathering and historical damage. Masonry repairs were carried out using brick and stone reintegration, visible today in the tower's exterior where later additions differ slightly in texture and color from the original material. The entrance and lower interior spaces were also restored and adapted as part of the monument's transformation into a public-access space, including interventions to accommodate its use as a café/bar, such as repairs to floors, minor reinforcements of interior walls, and functional modifications to the circulation path.

Several earlier consolidations addressed cracks, missing joints, and weakened wall cores, but these efforts were local and partial, leaving underlying issues unresolved—particularly moisture infiltration, mortar decay, and structural discontinuities between original Venetian-period masonry and later repairs. Visible inconsistencies in mortar composition and masonry finishes, identified during the architectural survey, further indicate multiple phases of non-homogeneous past restoration. Collectively, these earlier interventions helped prevent immediate structural failure, but did not constitute a comprehensive conservation program, making new, technically coordinated restoration efforts necessary.

3. Condition Assessment (Pre-intervention)

3.1 Castle of Bashtova

Overall deterioration

Prior to intervention, Bashtova Castle exhibited widespread and progressive deterioration across its perimeter walls, towers, and internal surfaces. The architectural survey discovered a monument suffering from structural instability, material decay, and biological overgrowth, resulting from long-term exposure, lack of maintenance, and previous incomplete restorations. Extensive vegetation growth, with weeds, shrubs, and moss penetrating wall cores, accelerated mortar loss and dislodging of stone blocks. Large portions of the walls presented detached and missing stones, particularly where moisture infiltration has weakened the bonding mortar.

Presence of cracks in masonry

Throughout the towers and curtain walls, there were multiple vertical, horizontal, and diagonal cracks caused by soil settlement, geological conditions, and differential movement between historic construction phases identified. Several zones demonstrated severe mortar erosion, leaving masonry joints open, friable, or previously filled with inappropriate cement-based mortar, which has contributed to increased cracking and incompatibility stresses. Chromatic alterations—darkening, staining, and localised soot patterns—appear on several wall sections, attributed to atmospheric agents and past fire/smoke exposure.

Degradation or missing portions of walls

In multiple areas, particularly the northeast and southeast walls, the battlements and parapets were heavily degraded, with missing crenellations, collapsed edges, and unsafe passageways. The site also contains structural voids, openings, and missing architectural elements, including the complete loss of one tower. Stone staircases along the interior wall-walk are cracked, broken, or partially collapsed, making circulation unsafe.

Surrounding areas

The surrounding terrain reveals additional concerns such as uncontrolled vegetation, inappropriate wire mesh additions, and exposed foundations where soil level changes or erosion have occurred. Moisture-induced deterioration—manifested as biological patina, stone detachment, and mortar disintegration—was particularly severe near ground level, where inadequate drainage contributed to rising damp.





Overall diagnosis

Overall, the pre-intervention condition of the Castle of Bashtova reflected a monument at risk of continued structural decline. The combined impact of environmental exposure, biological colonisation, moisture infiltration, past incompatible repairs, and partial structural collapses, worsened by the effects of the earthquake, created an urgent need for systematic conservation, stabilisation, and restoration.

3.2 Castle of Ishëm

Deterioration

The pre-intervention condition of the Castle of Ishëm and the adjacent building revealed widespread and progressive deterioration caused by long-term lack of maintenance, exposure to environmental agents, and inappropriate past interventions. The castle walls, entirely built in stone masonry, appeared in severely degraded form, with multiple forms of damage, including deep cracks, detached stones, loss of bonding mortar, and chromatic alteration from atmospheric agents.

Severe vegetation

Aggressive vegetation—trees, shrubs, mosses, and biological patinas—had colonised wall crowns and masonry joints, accelerating decay by retaining moisture and producing acids that erode minerals in the stone. In several areas, the wall heads were decayed, showing erosion and structural instability, while microorganisms formed biofilms causing both aesthetic and structural damage.

Photo Caption: Left: Vegetation overgrowth Right: Cracks in the masonry





Previous inappropriate interventions

Previous repairs performed with cement-based mortars further contributed to deterioration by trapping moisture and increasing the erosion rate of original stones. The castle's towers exhibited significant structural injuries, including deep fissures, loss of masonry elements, and in some cases only partial remnants of the original tower volumes remained.The area inside the fortification had also experienced detrimental human interventions: inappropriate additions, such as private buildings leaning on castle walls, visible water installations, and makeshift materials, disturbed the monument's authenticity and integrity.

Spoliation and partial demolition of walls for residents' access routes further compromised the structure. The building near the fortification appeared in a heavily deteriorated state, with collapsed portions of the roof and walls, failing timber elements, and overall structural instability.

Overall diagnosis

Collectively, these conditions indicated an urgent need for conservation, structural consolidation, and removal of inappropriate additions, as thoroughly documented in the technical assessment.

3.3 Castle of Lezha

Structural instability

Before intervention, the northern section of Lezha Castle exhibited serious structural instability and widespread deterioration affecting both the 4th-century BC wall and the 11th–12th-century medieval wall built above it. The survey revealed detached stones along the wallhead of the ancient fortification, where seismic activity, and long-term weathering had caused substantial loss of original blocks. The upper medieval wall showed multiple vertical and diagonal cracks, indicating advanced masonry displacement and loss of cohesion within the wall core.

Presence of vegetation

Vegetation was another major degrading factor: shrubs and grass had colonised the wall crown and the adjacent slopes, retaining moisture and accelerating mortar erosion. In several areas, the pathway on top of the wall had become unsafe due to missing stones, uneven surfaces, and structural gaps. Differential settlement between the ancient and medieval construction phases—resulting in deformation along the north-facing segment were as well present.





Photo Caption: Cracks in the masonry

Overall diagnosis

Overall, the pre-intervention condition reflected a high-risk scenario, characterised by stone detachment, active cracking, biological overgrowth, and progressive destabilisation of a structure composed of two historically distinct wall systems. Without urgent consolidation, the affected section was at risk of partial collapse, threatening both the monument's integrity and visitor safety.

3.4 Ruins of St Mary

Degradation

Before intervention, the Church of St. Mary stood as a severely deteriorated ruin, with extensive structural, material, and environmental degradation documented across all surviving elements. The monument's remains—consisting of the eastern wall with central and side apses, the northern wall, fragments of the southern and northern arcades, and portions of perimeter walls—were in poor and unstable condition, with large portions missing or collapsed. The building lacked its original floor entirely, exposing accumulated soil, debris, and fallen stones across the entire interior footprint. The stone wall degradation, including disintegration of the masonry fabric, missing stones, wall collapses, and loss of architectural elements was widespread.

Structural instability

Structural instability was evident through numerous cracks in the walls, wall-head decay, and significant sections of masonry leaning or partially detached. The apse wall, though standing, showed advanced degradation, including chromatic alteration and fresco damage. Moisture infiltration and environmental exposure had led to loss of mortar binder layers, leaving joints eroded and wall cores exposed. Substantial piles of fallen stones, collapsed wall sections—particularly along the western and southern edges—and open wall cores where stones or mortar had deteriorated beyond recovery were evidenced as well.

Vegetation

The site was heavily affected by uncontrolled vegetation growth, with trees, shrubs, and ground plants invading wall joints, foundations, and the surrounding terrain. Vegetation roots caused mechanical displacement of stones and increased moisture retention, accelerating decay. In several zones, inappropriate or non-authentic materials were present, likely remnants of past partial repairs.

Topography

The church grounds were also compromised: the topography around the site showed uneven ground levels, soil accumulation against exterior walls (notably on the north and apsidal sides), and areas requiring archaeological excavation to relieve soil pressure and better understand structural behavior.

Overall diagnosis

Overall, the pre-intervention condition reflected a monument at high risk of continued collapse, with pervasive structural weakness, biological colonisation, material loss, and environmental vulnerability. Without immediate conservation, the remaining architectural fabric—including valuable medieval phases and scattered fresco fragments—faced the imminent threat of irreversible deterioration.





Photo Caption: Left:Removal of concrete poles; Right: Collapsed portions of walls

3.5 Venetian Tower

Structural condition

Before intervention, the Venetian Tower of Durrës stood in a visibly deteriorated and structurally vulnerable state, showing the cumulative effects of time, weather, incompatible repairs, and inappropriate past uses. Its stone masonry—once robust and finely assembled—displayed widespread damage: fractured stones, missing blocks, eroded joints, and large areas where hard cement-based mortars had been applied, creating incompatibility with the historic lime construction. In many sections, these past repairs had accelerated degradation rather than preventing it. The walls were further marked by cracks, some shallow and others deeper, signaling structural stress that required monitoring and remediation.



Photo Caption: Degraded interior

Degradation

Biological growth had taken a strong hold across the façade and interior surfaces. Mosses, small plants, and root systems penetrated into joints, while a dark biological patina had spread across stone surfaces, especially where moisture had accumulated. Dampness and staining were visible on both floors and vaults, evidence of long-term water infiltration and insufficient drainage. Inside the tower, the vaults had been whitewashed and partially patched with low-quality materials; in several places, the original stonework had been concealed behind later plaster or cement applications. The floors also bore signs of deterioration, with cracked or detached tiles and layers of non-original finishes added during later functional adaptations.

Inappropriate additions

A significant portion of the damage stemmed from inappropriate additions made during the tower's use as a bar. Non-historic flooring, electrical installations, rails, doors, and volumes had been inserted without regard for the monument's fabric. The terrace and roof level were among the most severely compromised areas: the historic roof had been overlaid with bitumen and concrete tiles, altering water runoff and contributing to moisture-related deterioration below. Exposed electrical wiring and makeshift structural elements further disrupted the historical integrity of the monument.

Overall diagnosis

Overall, the tower presented a mosaic of structural instability, material decay, biological colonisation, and intrusive modern additions. Its authenticity had been compromised by incompatible materials and uncontrolled interventions, while its masonry and surfaces were threatened by prolonged exposure and neglect. The pre-intervention assessment made clear that only a coordinated and professionally guided conservation effort could stabilise, restore, and protect this important Venetian-period fortification.

4. Conservation Philosophy and Approach

4.1 Theoretical Framework

The conservation philosophy guiding interventions at Bashtova Castle, Ishëm Castle, the Ruins of St. Mary Church, Lezha Castle, and the Venetian Tower is rooted in internationally recognised principles of heritage preservation, prioritizing authenticity, minimal intervention, and long-term sustainability. Each monument embodies a unique architectural narrative and distinct historical layers—from Illyrian and medieval fortifications to Venetian military engineering and medieval ecclesiastical architecture—requiring an approach that protects their material integrity while enhancing their legibility as cultural landmarks.

Authenticity

Central to the approach is preservation of authenticity, ensuring that original materials, construction techniques, and architectural forms are retained wherever possible. Interventions focus on consolidating existing structures rather than reconstructing missing elements, thereby maintaining the visual and historical continuity of each site. Any new material introduced is carefully selected to be compatible, reversible, and distinguishable, respecting the patina of age while ensuring that future generations can clearly understand what is original and what is restored.

Minimal Intervention

Following the Venice Charter (1964) and ICOMOS Principles, interventions were limited to what was strictly necessary to ensure structural stability, material conservation, and safe contemporary use. This includes targeted structural consolidation of deteriorated masonry, careful reintegration of missing stones, and the use of lime-based mortars consistent with traditional building practices. Cleaning methods are gentle and non-

invasive, designed to remove harmful deposits—such as biological growth, cement residues, or accumulated debris—without damaging the historic fabric.

Integrity of archaeological and stratified layers

A key priority across all five sites is respecting the integrity of archaeological and stratified layers. Excavation is limited to essential conservation needs and is always carried out with archaeological supervision. Where medieval or ancient substructures are exposed—such as at Bashtova and Lezha Castles—interventions are designed to avoid imposing additional loads on ancient foundations, ensuring that earlier construction phases remain legible within the monument's evolution.

Reversibility and documentation

Where possible, materials and techniques were chosen to be reversible (e.g., surface treatments, protective coatings) or retreatable (e.g., lime-based mortars instead of cementitious mixes). This ensures that future interventions may upgrade or correct present methods without causing loss to the authentic fabric.

Every intervention is to be recorded through drawings, detailed photographs, and technical descriptions, forming a transparent archive that allows future conservators to understand and, if necessary, reverse present-day actions. This aligns the work with best practices defined by ICOMOS, the Venice Charter, and contemporary conservation ethics.

Overall

The conservation of these sites embraces their role in the cultural and social life of surrounding communities. Enhancing safe accessibility, improving visitor interpretation, and protecting the landscape setting are integral components of the approach. By reinforcing their structural stability and preserving their historical meaning, the conservation approach ensures that these monuments continue to function as touchstones of Albania's collective memory and identity.

4.2 Ethical Considerations

The conservation philosophy followed the core ethical frameworks of:

- UNESCO Recommendations:The safeguarding of cultural heritage as a public good, ensuring transmission of cultural significance to future generations. In this context, both buildings were treated as irreplaceable witnesses of Albania's political, social, and architectural history.
- ICOMOS Charters: The following ICOMOS documents informed the ethical approach: The Venice Charter (1964) – guidance on authenticity, minimal intervention, and conservation over reconstruction; Burra Charter (2013) – values-based significance assessment and decision-making; Principles for the Preservation and

Conservation/Restoration of Built Heritage (2003); Principles for the Analysis, Conservation and Structural Restoration of Built Heritage (2003) – informing seismic consolidation strategies; Charter for the Protection and Management of Archaeological Heritage (1990)

- National Heritage Legislation: For all five assets being designated monuments of first category, ethical requirements prohibited internal or external changes not directly related to stabilisation or conservation.

4.3 Criteria for Decision-Making

Decision-making followed a structured, multi-layered process:

Significance Assessment

Interventions were prioritised according to the cultural, architectural, historical, and symbolic values of each surviving element across the five monuments:

- High value: original fortification walls, Illyrian and medieval masonry, tower structures, archaeological layers, apse and nave remains, surviving fresco fragments, historic architectural details, and authentic construction materials (lime mortar, stone blocks, timber components).

- Medium value: later but historically meaningful additions—Ottoman or Venetian repair phases, 20th-century conservation attempts, and modifications that form part of each monument's documented evolution.

- Low value: intrusive or non-authentic additions including cement-based repairs, modern concrete patches, ad hoc installations, vegetation overgrowth, residual service elements, and inappropriate adaptive-use alterations.

Condition Assessment

Conservation decisions were informed by detailed diagnostic investigations, including structural analysis, crack mapping, material characterisation, archaeological assessment, and moisture studies. These findings defined the necessary level of intervention across the sites:

- Stabilisation for leaning walls, cracked towers, collapsed masonry, and compromised foundations.

- Conservation for weathered stone surfaces, eroded mortar joints, biological colonisation, and vulnerable decorative or archaeological elements.

Reconstruction or reintegration only when essential for structural safety, legibility, or protection of historic fabric, and supported by clear physical evidence.

Risk of Loss

Priority was given to elements facing imminent danger of collapse or irreversible deterioration, such as:

- Unstable fortification towers and wall segments.
- Masonry loosened by vegetation, moisture infiltration, or seismic cracking.
- Wall crowns with missing stones and disintegrated mortar.
- Archaeological features exposed to erosion, vandalism, or environmental degradation.
- Fresco fragments and fragile liturgical remains at the Ruins of St. Mary.

Functional and Safety Requirements

While all five sites are primarily heritage assets, the decision-making process also considered:

- Visitor safety on elevated wall-walks, towers, and uneven archaeological terrain.
- Accessibility improvements that do not compromise authenticity.
- Long-term site management and the ability of local institutions to maintain interventions.
- Landscape and circulation needs for public interpretation and cultural tourism.

Regulatory and Ethical Requirements

National legislation for monuments of Category I defined the permissible scope of intervention and ensured that methods aligned with heritage protection standards. These requirements—supported by ICOMOS charters—guided:

- Strict preservation of the original fabric.
- Prohibition of alterations not directly related to stabilisation, conservation, or visitor safety.
- The use of compatible, reversible materials.
- Full respect for archaeological layers and authentic construction typologies.

4.4 Risk Assessment and Prioritisation

4.4.1 Risk Assessment

The five monuments exhibit diverse typologies—fortifications, archaeological ruins, medieval religious architecture, and Venetian military engineering—but share common vulnerabilities tied to age, exposure, structural complexity, and incomplete historic repairs. A harmonised risk assessment framework was applied to prioritise interventions across all sites, ensuring that resources were directed to the most critical threats to heritage fabric, structural stability, and visitor safety.

Structural Instability Risks

Structural failure was identified as the highest-risk category across all assets, largely due to cracked, leaning, or partially collapsed masonry.

- Bashtova Castle: widespread wall displacement, cracked towers, voids, and missing crowns.
- Ishëm Castle: tower deformation, structural fissures, soil pressure against walls.
- Lezha Castle: instability where medieval walls sit atop foundations; active cracking on the northern wall.
- Ruins of St. Mary Church: collapsed nave walls, weakened apse, and exposed wall cores.
- Venetian Tower: cracked masonry, damaged stone blocks, and weakened vaults.

Priority: Immediate stabilisation and consolidation, with monitoring for areas showing active movement.

Environmental and Moisture-Related Risks

Rainwater infiltration, rising damp, poor drainage, and exposure to wind and coastal conditions contribute to long-term degradation.

- High moisture exposure at Bashtova, Lezha, and Ishëm due to open hilltop or riverside locations.
- Severe water infiltration at the Venetian Tower and St. Mary Church ruins, accelerating mortar loss and stone decay.
- Vegetation growth (roots, moss, shrubs) retains moisture and weakens masonry across all sites.

Priority: Removal of vegetation, improved drainage solutions, repointing with breathable lime mortars, and protection of vulnerable surfaces.

Material Degradation Risks

All sites show deterioration stemming from erosion, mortar loss, biological colonisation, and incompatible past repairs.

- Cement-based mortar repairs have caused cracking, moisture trapping, and accelerated decay.
- Salt deposits, staining, and patina affect stone surfaces.
- Fresco fragments at St. Mary are at immediate risk due to exposure.

Priority: Cleaning, mortar replacement, desalination where necessary, and conservation of sensitive artistic or archaeological elements.

Archaeological and Stratigraphic Risks

Sites contain layered historic phases requiring careful protection.

- Lezha Castle: Illyrian foundations at risk from settlement and surface erosion.
- Ishëm and Bashtova Castles: medieval and Ottoman phases superimposed on earlier masonry systems.
- Ruins of St Mary Church: archaeological remains of the liturgical platform and burials.

Priority: Minimal excavation, protective measures for exposed layers, and supervision by archaeologists during all works.

Safety and Access RiskS

Unstable walls, missing stone steps, uneven surfaces, and collapsing elements pose hazards for visitors and site personnel.

- Wall-walks at Bashtova and Lezha: unsafe due to missing stones and parapets.
- Towers at Ishëm and Venetian Tower: fragile stairs, narrow passages, damaged vaults.
- Ruins of St. Mary Church:: unstable walls and loose debris in the nave and surrounding terrain.

Priority: Temporary shoring, controlled access, installation of protective barriers, and phased visitor circulation improvements.

Human-Induced Risks

Past inappropriate uses and interventions have introduced additional risk factors.

- Venetian Tower: intrusive installations from bar use; concrete and metal elements harmful to masonry.
- Ishëm Castle: informal construction against the walls by residents.
- Bashtova and Lezha: stone theft or removal in past decades.
- All sites: unauthorised access and vandalism where protective measures were absent.

Priority: Removal of intrusive elements, establishment of buffer zones, improved supervision, and community engagement.

4.4.2 Prioritisation strategy

Intervention prioritisation followed a structured approach:

1. Immediate risks to structural stability—areas with collapse potential or active cracking.
2. Elements at imminent risk of irreversible loss, such as fragile frescoes, disintegrating masonry, or unstable tower bases.

3. Components essential to preserving historical authenticity, including original stonework, archaeological layers, and distinctive architectural features.
4. Safety-critical elements, such as unstable pathways, parapets, or open voids.
5. Secondary works enhancing site resilience, such as drainage, vegetation control, and reversible protective measures.

Conclusion

The risk assessment confirms that despite their varied typologies, the five assets share common threats requiring coordinated, ethically guided action. Prioritisation was therefore based on stabilising the monuments, preventing further loss, safeguarding archaeological evidence, and ensuring safe public access, all while maintaining the authenticity and cultural significance of these irreplaceable heritage sites.



Photo Caption: Young professional trained in pointing techniques

5. Conservation Interventions

The conservation and rehabilitation of the Bashtova Castle, Ishëm Castle, the Ruins of St. Mary Church, Lezha Castle, and the Venetian Tower involved a wide range of conservation, structural consolidation, and landscaping interventions. Additional to overall conservation interventions, tailored archaeological excavations were conducted at the Castle of Bashtova and Ruins of St Mary. Comprehensive conservation intervention for all five sites were required due to accumulated deterioration, repeated non-specialist alterations, and the significant impact of the 2019 earthquake. Besides the conservation interventions, the Castle of Bashtova also benefited from newly constructed Visitors' center, while the Venetian Tower and the Castle of Bashtova also benefited from highly innovative interpretation, which was implemented through contemporary means of multimedia. Furthermore, Castle of Bashtova, Castle of Ishem, Ruins of St Mary Church, Venetian Tower and Lezha Castle also benefited from additional interpretation panels to be used for future learning for all visitors and residents near the sites.

5.1 Castle of Bashtova

5.1.1 Preliminary Works and Site Preparation

The intervention began with the full preparation of the construction site, as documented in the detailed design. A perimeter fence, made of corrugated metal sheeting supported by timber elements, was installed around the working zone, to ensure safety and protect visitors and workers. Controlled entry points to the castle and the construction site were established, accompanied by an information board of works, pedestrian signage, and clearly marked circulation paths for both staff and visitors.

Temporary facilities—including a mobile crane, brick and iron depots, worker wardrobes, and a guard station—were installed to support construction logistics and material handling within the protected area.

5.1.2 Removal of Non-Original and Deteriorated Elements

Before conservation could begin, the design called for the systematic removal of all harmful or incompatible additions accumulated over decades. These included:

- Dense vegetation, moss, and plant roots covering walls, battlements, and towers.
- Displaced soil accumulating over wall heads, tower crowns, and guard-passages, which had historically contributed to moisture retention and structural pressure
- Deteriorated mortar and unstable stones, particularly in areas where mortar had disintegrated or where vegetation growth had loosened joints.
- Failed or inappropriate past interventions, such as deteriorated brick vault repairs, incompatible mortar patches, and temporary materials.

This preparatory removal phase was essential to allow the correct application of traditional materials and compatible conservation techniques.

5.1.3 Archaeological investigations

Parallel to preparation works, the first set of archaeological excavations were undertaken. All together, 11 test pits were excavated, leading to an additional phase of archaeological investigations for test pits where results were not conclusive. Out of all the test pits investigated, 4 test pits revealed the most significant findings:

- Test pit 1[2] - Deep excavation uncovered two concentric masonry foundations belonging to the circular north tower, along with a dense accumulation of artefacts, including over 400 iron cannonballs, stone projectiles, metal slag, pottery, and evidence of an ammunition storage area.

2. Test pit 1,2,3,4 is used for descriptive purposes - in official reporting test pits that yielded most information were S3, 4, 8 and 9

- Test pit 2 - Exposed a well-preserved section of historic cobblestone paving, confirming the line of an internal circulation path
- Test pit 3 - Revealed severe flood-related erosion, and confirmed the complete loss of the former southwest tower, with no surviving structural remains
- Test pit 4 - Produced a major discovery—a monumental western gateway with multiple construction phases, disproving earlier assumptions that a tower once stood in that location.
- After all the findings were discussed they affected the course of conservation in the following way:
- Test pit 1 - While the findings were extremely interesting and worthwhile leaving exposed for future education, the trench wall was loose and, given the high probability of inadequate maintenance in future, it was decided that the findings would be drawn and interpreted in a form of information table, while the test pit would be covered.
- Test pit 2 - The same reasoning applied as for Test pit 1.
- Test pit 3 - Results have informed the design, where initially designed interpretation was changed to reflect the new found condition.
- Test pit 4 - The same actions followed as for Test pit 3.

Photo Caption: Archaeological test pits





5.1.4 Material testing

In order to deepen knowledge of the materials used in the construction of Bashtova Castle, to understand deterioration and decay patterns, and to provide specific recommendations for conservation, particularly regarding the composition and condition of the mortars, 15 material samples from different locations around the castle were collected for analysis. Samples were collected for microscopy and thermoluminescence analysis.

The results of the tests concluded that, for conservation purposes, a new pointing mortar should be designed to match the historical materials. The key recommendations included:

- Binder: Use an industrial natural hydraulic lime (if available, NHL 3.5).
- Aggregate: Use local sand with grain size fractions of 0-1 mm and a moderate amount of finer fractions (<0.1mm).
- Binder-to-Aggregate (b/a) Ratio: Choose ratios between 1:3 and 1:4 (by volume).
- Important to note is that final recommendations advised against using an artificial mixture of Portland cement and lime putty, and emphasised the critical importance of good workmanship and proper curing techniques (preparation, pre-wetting, correct mixing, application, and keeping surfaces wet while curing).

IAn important finding from the thermoluminescence analysis revealed two key phases of construction: an older phase, where the building bricks have an overlapping dating range of 1530–1545, suggesting that the main part of the castle was likely built at that time or possibly extended into the last two-thirds of the 16th century (allowing for reused or prefabricated bricks); and a later phase, with a dating range of 1745–1895, confirming that this part was constructed in the second half of the 18th or in the 19th century.

5.1.5 Structural Consolidation and Seismic Improvements

Following the earthquake, structural reinforcement was a core priority.

The design incorporates a broad range of structural consolidation measures aligned with the historical construction phases of the castle:

Wall Consolidation and Repointing

- Reconstruction and completion of missing masonry in areas of material loss, following original construction techniques noted in the design's historical analysis.
- Repointing joints using compatible lime-based mortar, replacing deteriorated or cement-based patches.
- Consolidation of parapets and battlements, ensuring structural integrity at the wall crowns





Photo Caption: Consolidation works

Tower Restoration

- Restoration of Tower A, including filling of wall cores and consolidation of battlements, with the addition of a waterproofing layer on the wall heads and adjacent surfaces to prevent water penetration.
- Repair of northern and eastern towers
- Reconstruction of damaged vaults and arches, including brick vault restoration
- Crack Repair and Local Stabilisation
- Cleaning and repairing deep cracks, including stitching with compatible materials.
- Stabilisation of wall segments where loss of material or historic deformation has created instability.

5.1.6 Restoration of Battlements, Guard Passages, and Crown Elements

The design continues earlier conservation logic by addressing the castle's circulation system:

- Battlement Repair and Reconstruction
- Reconstruction of battlements with arrow slits along key sections
- Cladding of battlements with bricks, following the historic technique
- Guard-Path Restoration

- Leveling and resurfacing of the guard passage along the walls, restoring safe horizontal circulation for maintenance and visitor movement.
- Stone slab paving reinstated where original materials existed or where archaeological evidence supports their use

5.1.7 Waterproofing, Surface Protection, and Drainage Improvements

Given Bashtova Castle vulnerability to moisture:

- Installation of waterproofing layers on wall heads, towers, and crown elements.
- Cleaning and reshaping wall crowns to encourage proper runoff and prevent water stagnation.
- Drainage-related cleaning, including removal of soil buildup that had contributed to moisture absorption and structural loading.

5.1.8 Reconstruction of Historically Documented Elements

Where archaeological or documentary evidence was clear, the design includes selective reconstruction:

- Completion of arches and vault segments.Additional interpretative structures which stand in the place of a former tower/gate. of the gate which was serving as river post (the newest discovery yielded from archaeological excavations)

Photo Caption: Final outcome of pointing, consolidation and installation of railings







Photo Caption: Left: Interpretative structure of the shape of the gate which was serving as river post (the newest discovery yielded from archaeological excavations)

Right: Railings on stairs and walkways

5.1.9 Site Cleaning, Presentation, and Accessibility

The intervention also includes broader site improvement works:

- Clearing the internal and external perimeter of the castle from vegetation and accumulated debris.
- Improving access routes, including paths leading to the castle entrance and internal circulation zones.
- Safety railings and platforms for accessing the walls.
- Ensuring the monument's legibility, by exposing authentic masonry surfaces previously obscured.

5.1.10 Construction of Visitors' Center

Besides the conservation, the design for the Castle of Bashtova included a construction of a Visitors'Center, to enable the creation of visitors' facilities. This meant that, additional to construction, mechanical, electrical, and plumbing (MEP) systems were installed at the Visitors' center, to ensure functional and code-compliant operation. This included:

- HVAC, firefighting systems, water supply and sewage, rainwater drainage, and complete electrical wiring.
- Fire detection, CCTV, LAN network, lighting, grounding systems, and digital infrastructure.
- Installation of accessibility and emergency exit components including anti-panic door handles.







Photo Caption: Above: Visitors' center; Below - Left: Augmented Reality (AR) markers; Right: Interpretation tables

5.1.10 Interpretation and enhanced visitors experience

Several interpretation tables are installed around the Castle, showcasing its history but also the findings yielded during the conservation works. Furthermore, for the purposes of more active engagement during visits and to enhance the visitor experience of the Castle, a tailored augmented reality application was developed. The application runs after scanning post marks placed along the side pathway.

5.2 Castle of Ishëm

The conservation interventions for Ishëm Castle and the building near the fortification was comprehensive, addressing structural instability, material decay, environmental deterioration, and the removal of intrusive modifications. Guided by archaeological verification, the project followed a phased sequence of interventions, beginning with preparatory works, and concluding with the full consolidation of walls, towers, drainage systems, and the Castle setting.

5.2.1 Preliminary Works and Site Preparation

Works commenced with the installation of scaffolding along the Castle's external walls (northeastern, southwestern, and tower sections), enabling safe access to degraded stonework. Vegetation removal—particularly aggressive root systems on wall crowns and joints—was carried out to prevent further biological deterioration. Archaeological test trenches were opened across key junctions of towers and walls to determine foundation conditions, original masonry traces, and levels of structural loss, ensuring that subsequent conservation actions were based on verified subsurface information.

5.2.2 Removal of Non-Original and Deteriorated Elements

A systematic clearance of incompatible additions and deteriorated materials took place, including:

- Cement-based mortar repairs that had increased permeability and accelerated stone erosion.
- Collapsed wall fragments, later added masonry sections, deteriorated wooden fences, and ad-hoc constructions obstructing the walls.
- Intrusive concrete pavements, inappropriate repair patches, and elements obstructing archaeological layers.
- Dense biological colonisation—lichens, algae, roots—was removed through controlled mechanical cleaning.

5.2.3. Masonry Consolidation and Structural Repairs

A major component of the project involved restoring the structural cohesion of the stone fortification:

- Reintegration of missing masonry segments where stones had fully detached or collapsed.
- Repointing joints with compatible lime mortar, replacing hard cement fillings.
- Reintegration of displaced stones following original construction patterns identified through archival research and field evidence.
- Crack stitching and stabilisation, addressing fissures caused by seismic activity, water infiltration, or foundation movement.
- Wall crown restoration, reinstating protective masonry layers where erosion had left the wall heads exposed.

These interventions were extensively applied to all towers, and the full lengths of the northeastern and southwestern curtain walls.





Photo Caption: Left: Crown stabilisation; Right: Crack stitching

5.2.4. Cleaning and Restoration of Stone Surfaces

Surface conservation included:

- Mechanical removal of biofilm deposits and chemical-free cleaning of chromatically altered surfaces.
- Gentle brushing and low-pressure water cleaning to restore stone breathability.
- Removal of pollutants, dust, and accumulated soil deposits along bases and tower interiors.

5.2.5. Foundation Verification and Repairs

Archaeological trenches confirmed areas of compromised foundations at tower junctions (especially Towers III and IV). Interventions included:

- Stabilizing ground conditions with controlled fills.
- Strengthening foundation bases where voids or erosion were detected.
- Ensuring lateral stability by reintegrating the lower masonry courses.

5.2.6. Drainage and Moisture Management

Given the Castle's hydrological challenges, a new drainage strategy was implemented:

- Cleaning and rehabilitation of existing discharge conduits.
- Installation of subsurface drainage lines.
- Refilling terrain to improve runoff patterns away from the walls.
- Treatment of moisture-affected areas with breathable conservation materials.

5.2.7. Landscape and Access Improvements

The project improved accessibility, while respecting the monument's integrity:

- Restoration and partial reestablishment of pedestrian paths.
- Clearing vegetation to re-expose the castle silhouette.
- Enhancing the visual and functional relationship between the Castle entrance, secondary access routes, and site pathways.



Photo Caption: New pedestrian paths



5.3 Castle of Lezha

The emergency consolidation of the northern wall of Lezha Castle focused on stabilizing a structurally vulnerable section of the portion of the wall initially constructed during the 4th century BC and completed in the 11th–12th centuries. The masonry distress included detached stones, wall-head disintegration, and active cracking. The conservation works were tailored to these conditions and included the following measures:

5.3.1 Archaeological excavations

Prior to the start of the emergency consolidation, initial archaeological excavations were undertaken in the area where soil was to be removed for placement of new ties.



Photo Caption: Archaeological excavations

5.3.2 Stabilisation of Detached Stone Blocks

Across the top of the wall, multiple stones had separated from the wall head. These were carefully repositioned and reintegrated into the original construction to prevent further collapse and reinstate load continuity.

5.3.3 Consolidation of Cracked Masonry

A significant vertical crack in the 11th-12th century wall was stabilised through structural stitching and masonry consolidation. Additional measures included metal strapping and construction of a foundation. This intervention prevented propagation of the crack into adjacent sections and restored the structural behavior of the wall. Works included the cleaning of the fissure, inserting compatible materials, and re-bonding the separated wall segments.

5.3.4 Reinforcement of the Meeting Point Between different Periods

Because the medieval wall sits directly atop the prehistoric wall, the design required targeted reinforcement of this junction, where differential settlement had caused discontinuities. Conservation actions ensured:

- Improved contact between the two construction phases.,
- Stabilisation of uneven interfaces, and
- Strengthening of exposed lower blocks.

This reduced instability caused by the significant height difference and by long-term erosion visible in the drawings.

5.3.5 Cleaning and Removal of Vegetation

Vegetation had accumulated along the path and in masonry joints, especially on the 4th BC wall section. All invasive roots and shrubs were removed to prevent ongoing mechanical damage. After cleaning, joints were consolidated with compatible lime mortar.

Photo Caption: Installing new ties





5.4 Ruins of St Mary Church

The conservation program for St Mary Church in Mamurras focused on stabilising the severely deteriorated medieval structure, addressing structural vulnerabilities, masonry consolidation and conservation. The work followed a comprehensive approach informed by detailed architectural, archaeological, and material assessments. The interventions can be grouped into several main categories.

5.4.1. Structural Stabilisation and Masonry Conservation

Given the extensive degradation of stone masonry—including missing wall sections, deep cracks, mortar loss, and collapsed areas—the project included systematic consolidation of the remaining walls. This involved re-bedding unstable stones, reconstructing collapsed stretches following existing geometry, and repointing joints with compatible lime-based mortars. Special attention was given to wall-capping stabilisation, where deterioration was widespread. Missing upper portions were carefully consolidated to prevent further disintegration.

5.4.2. Vegetation Clearance and Environmental Mitigation

The monument was heavily engulfed in uncontrolled vegetation, both on the walls and throughout the surrounding terrain. Plant growth was causing structural damage through root penetration and moisture retention. All invasive vegetation was removed from walls, foundations, and adjacent soil surfaces. The ground around the monument was cleaned and regraded where necessary to minimise soil pressure on vertical structures, especially around the apse and northern nave.

5.4.3. Archaeological Investigations and Excavation

Archaeological excavations were undertaken in three critical zones:

- **S1: Outer area of the apse** – to release soil pressure and reveal foundation behavior.
- **S2: Outer area of the northern nave** – to expose buried wall sections and reduce earth accumulation.
- **S3: Southern gate area** – to determine whether visible wall damage extended to the foundations.

These excavations supported both conservation decision-making and the documentation of construction phases.

5.4.4 Conservation of Decorative Elements and Surface Treatments

Although the surviving frescoes were limited and highly deteriorated, the conservation intervention addressed areas showing chromatic alteration and fresco decay. Interventions included gentle cleaning, stabilisation of loose decorative plaster, and application of protective treatments against environmental exposure.

5.4.5 Removal of Incompatible Materials and Debris

The site contained numerous piles of fallen stones, dislocated masonry, and non-authentic materials accumulated over time. These were systematically sorted, with reusable stones catalogued for reintegration into the structure. Non-original or incompatible materials (e.g., modern fill, inappropriate mortars, and debris) were removed.

5.4.6. Protection and Rehabilitation of Site Layout and Access

The intervention improved the readability and safety of the monument's immediate environment. The surrounding square, churchyard, and access paths—were cleared, stabilised, and restored to allow for controlled visitor access. Pathways were re-established without altering the historic topography.

5.4.7. Ensuring Structural Readiness for Future Roofing Interpretation

While the original wooden roof no longer exists, the structural consolidation ensured that surviving arcades, apse walls, and nave divisions could endure environmental loads. Specifically designed roof covering was erected and covered the portion of the apse walls, specifically the portion of the walls containing wall paintings. The roof structure was designed to reflect the historical model the roof would have had in the time it was built.

Photo Caption: Consolidation of masonry



Overall Intervention Outcome

The conservation interventions aimed to halt decay, stabilise remaining architectural elements, and recover the monument's historical legibility without speculative reconstruction. By integrating structural consolidation, archaeological investigation, masonry repair, and environmental management, the project ensured the safeguarding of one of Kurbin's most significant medieval ecclesiastical ruins.





Photo Caption: Different consolidation activities



5.5 Venetian Tower

5.5.1 Preliminary Works and Site Preparation

Interventions began with the installation of scaffolding around the façades and the preparation of the construction site, allowing safe access to all building levels and ensuring controlled removal of deteriorated materials.

5.5.2 Removal of Inappropriate Additions

The intervention removed several layers and elements judged inappropriate due to their incompatibility with the monument. Cement layers at the base of walls, concrete tiles on the vault and terrace, and added construction volumes from previous decades were dismantled. These removals made it possible to recover the original contours, materials, and architectural language of the Tower.

Non-authentic doors, windows, and railings were also removed, with authentic materials and historically accurate forms used to restore openings and circulation paths.

5.5.3 Masonry Consolidation and Stone Restoration

A central part of the intervention involved the restoration and consolidation of the Tower's stone masonry. Deteriorated mortar joints were mechanically cleaned and repointed using a traditional lime-mortar mixture (1:2), ensuring compatibility with the original materials. Missing or damaged stones were replaced with authentic stone matching the historic fabric.

Stone frames, borders, and shattered openings were restored through careful filling and reconstruction, reintegrating structural stability and visual continuity. Wall heads were cleaned of patina and sealed with stone slates to prevent further moisture infiltration.

5.5.4 Treatment of Biological Growth and Surface Cleanings

The Tower had accumulated significant biological patina, moss, and vegetation. These were treated through controlled mechanical brushing or biocide application, depending on the fragility of the underlying material. Surfaces were cleaned of deposits and biological layers, revealing the original stone texture and preventing further deterioration. Where patina deposits were heavy, they were reduced with metallic brushes, ensuring the exposed masonry was protected and visually coherent.





Photo Caption: External and internal consolidation works

5.5.5 Roof and Terrace Rehabilitation

The terrace, which had been covered with inappropriate concrete tiles, was rehabilitated by removing these non-original elements and replacing them with authentic stone flooring. The intervention respected the Tower's structural logic and historic appearance.

The vaulted roof marking the stairs, previously obscured by tar and concrete brick coverings, was revealed and restored. This allowed the authentic construction technique to re-emerge and improved the roof's durability by eliminating moisture-trapping layers.

5.5.6 Interior Rehabilitation and Functional Restoration

Inside the Tower, interventions focused on removing inappropriate previous installations, such as electrical cables and commercial fixtures. Original stone floors were uncovered, and areas modified by modern use were carefully restored.

The interior spaces, including the ground floor and mezzanine, were returned to their authentic function, guided by historical documentation. Essential services—like the toilets—were rehabilitated in harmony with the monument's material palette.

5.5.7 Equipping the Tower for future use

The Venetian Tower was restored to host a fully operational Digital Interpretation Center. This meant that a careful consideration was to be given regarding additions of all equipment needed for reaching its new function. Large projectors, audio systems, interactive systems for digital performances etc were installed inside the towers' interior. The equipment was installed in a way that it can always be removed without any damage to historic fabric.

The digital content developed included high-resolution 3D reconstruction models, which are available through VR headsets; 360 degrees dome projection portraying the evolution of Durres; interactive content involving stepping on floor stones to activate digital reconstruction of artefact on the dome; love message involving sound and image travelling through the tower; audio guides; on-site reading via tablets and periscopes on the terrace including digitalised historical records of city's major events.

5.6 Conservation Documentation and Compliance

All works were conducted in alignment with conservation standards, documenting each intervention to ensure traceability and adherence to cultural monument regulations. Materials were chosen to match original composition or ensure compatibility where originals were absent.

Photo Caption: Installed projectors and dome projections





6. Results and Outcomes

6.1 Castle of Bashtova



Before

After



6.2 Castle of Ishëm



Before

After



6.3 Castle of Lezha



Before

After



6.4 Ruins of St Mary



Before

After



6.5 Venetian Tower



Before

After



6.6 Challenges encountered during intervention

No major issues besides the ones coming from regular implementation

6.7 Unexpected findings

6.7.1 Castle of Bashtova

The groundbreaking discovery coming as a result from the 2nd phase of archaeological excavations was certainly the finding of the remains of the port, confirming that Bashtova used to be a river post leading to the sea. This discovery is important as it has described this functionality of the Castle for the first time. Other findings, including traces of historical pavements and rich archaeological material, deserve continued attention and further research in the future.

7. Maintenance and Monitoring Plan

Towards the end of conservation interventions at the Castle of Bashtova, Castle of Ishëm, Ruins of St Mary Church and Venetian Tower, UNOPS has produced manuals of maintenance for both assets. The manual defines daily, weekly, monthly, seasonal, and annual maintenance cycles for various categories of interventions. The Castle of Lezha was not subject to the development of a maintenance manual due to the temporary nature of the intervention.

7.1 Castle of Bashtova, Castle of Ishëm and Ruins of St Mary Church

Daily, weekly, monthly, seasonal, and annual maintenance cycles including:

Daily:

- Visual check of walls, entrances, and circulation paths for new cracks, moisture, or fallen materials.
- Light cleaning and removal of debris inside accessible areas.

Weekly:

Vegetation control around the monument to prevent root damage.
Check for small surface erosions or material loss on exposed masonry.

Monthly:

- Inspect interior and exterior wall surfaces for biological growth, efflorescence, or early cracking.
- Check drainage routes for buildup or minor blockages.

Seasonal:

- Clean and inspect drainage and water-disposal systems after heavy rainfall and during autumn.
- Inspect roofed or protected areas for moisture infiltration and surface deterioration.
- Assess parapets, arches, and wall crowns that may be weather-affected.

Annual / Multi-Year:

- Annual structural condition check of all masonry walls and vulnerable architectural elements.
- Every 3 years: superficial façade inspection for cracks or deterioration.
  Every 5–7 years: façade cleaning, mortar joint touch-ups, and minor stone repairs as needed.

Emergency Maintenance:

- After Earthquake: Inspect for major cracks, fallen stones, displaced masonry; restrict access and involve specialists.
- After Fire: Assess structural damage and evaluate risks to materials; determine required stabilisation.
- After Heavy Rain: Check drainage performance, presence of water infiltration, and condition of weakened structures.
- After Strong Winds: Inspect for loose or fallen stones, damaged openings, and vegetation or debris hazards.

7.2 Venetian Tower

Daily, weekly, monthly, seasonal, and annual maintenance cycles including:

Daily:

- Visual check of spaces, entrances, walls, and circulation areas.
- Verify temperature in server/multimedia room (<25°C).
- Ensure electrical panel, UPS, and conditioning systems operate normally.

Weekly:

- Light cleaning of interior areas and removal of dust/debris.
- Basic functionality check of multimedia and digital equipment.

Monthly:

- Inspect walls, niches, dome, wooden elements, and surfaces for early signs of damage.
- Check for humidity infiltration, small cracks, or surface deterioration.

Seasonal:

- Inspect the conditioning system in the server room.
- Check terrace waterproofing and drains, especially after heavy rain.

Every 6 Months:

- Inspect fire extinguishers, fire alarms, hydrants; refresh evacuation plans and emergency numbers.
- Check the CCTV system and heating system.

Annual / Multi-Year:

- Annual structural inspection of façade, dome, arches, and wooden elements.
- Every 3 years: surface-level façade check for cracks.
- Every 5–7 years: façade cleaning and minor joint repairs.

Emergency Maintenance:

- After Earthquake: Check for cracks in façade, dome, arches, and terrace waterproofing; engage specialist team if needed.
- After Fire: Assess structural and equipment damage; plan restoration.
- After Heavy Rain: Inspect for water infiltration under terrace; check drains and waterproofing.
- After Strong Winds: Inspect terrace drainage for blockage; check doors and windows for damage.

8. Project Management and Funding

UNOPS (United Nations Office for Project Services) applied a unified, structured project management approach for the conservation and restoration of the Castle of Bashtova, Castle of Ishëm, Ruins of St Mary, Castle of Lezha and Venetian Tower, all implemented under the EU4Culture programme. Despite the different histories, conditions, and functions of all the monuments, UNOPS followed a consistent methodology designed to ensure quality, transparency, risk control, and long-term sustainability.

8.1 Condition assessment and conservation scope

For all buildings, UNOPS began by conducting:

- Technical assessment and Documentation
- Preliminary condition assessment
- Development of conservation scope

8.2 Stakeholder Coordination

- Collaboration with the Regional Directorate of National Cultural Heritage
- Engagement with users and state institutions operating inside each building
- Alignment with national heritage legislation and EU cultural preservation standards

8.3 Design Development and Technical Preparation

Throughout the duration of implementation of EU4Culture programme, UNOPS was supported by an external licenced conservation design team for the development of the conservation designs. The conservation designs were controlled and coordinated by the UNOPS infrastructure and cultural heritage team, which closely controlled all the portions of design.

Compliance and Approval Process

- Reviews by UNOPS - Once designs were controlled by the internal UNOPS team, and were defined as ready, they were sent for additional control by UNOPS Infrastructure and Project Management Group (IPMG). Only after designs were revised and IPMG certificate was issued, the designs were considered finalised.

- Reviews by heritage authorities - As per the Albanian legislation, once conservation designs are finalised they are submitted for approval to the National Scientific Council at the National Institute for Cultural Heritage. If the Scientific Council does not have any comments, the designs are forwarded to the National Council of Material Heritage. Once approved and respective conservation permits are received, the design can be procured for implementation. Important to note is that, if during implementation changes arise, designs need to be revised and re-sent for approval.
- Incorporation of safety, fire-protection, and energy-efficiency measures

8.4 Procurement and Contractor Management

Once designs were equipped with all respective permits, UNOPS ensured transparent, competitive procurement, including:

- Selection of qualified contractors licensed for conservation of heritage assets

Procurement followed UNOPS global procurement rules, ensuring integrity and value.

8.5 Oversight of implementation of works and quality assurance

During the implementation of works, UNOPS provided:

- On-site supervision on behalf of UNOPS, which meant that at least one associate civil engineer employed by UNOPS was daily on the site, monitoring progress, quality and controlling environmental, health and safety requirements. An important role for UNOPS engineers was risk management, where engineers were tasked with filing daily and weekly health and safety reports, risk assessment reports, and daily logs.

- Third party supervision - an external licensed supervision company was hired to support UNOPS in controlling implementation, certification of quality, implemented volumes etc throughout the duration of works. This was important, especially since the National Institute for Cultural Heritage, which initially provided this support, was lacking capacity specifically in areas of structural, mechanical and electrical engineering.

- Highly important was a follow up on all conservation measures which was done by UNOPS cultural heritage adviser regularly

8.5.1 Health and Safety

UNOPS applies a rigorous Health and Safety Management system designed to ensure that all restoration and construction activities are carried out with maximum protection for workers, visitors, and the surrounding community. This system is grounded in international HSE standards and includes comprehensive risk assessments, method statements, and safety protocols developed prior to the start of any work. On-site supervision ensures strict adherence to protective measures such as the use of personal protective equipment (PPE), scaffolding safety, fall-prevention systems, controlled access zones, and fire-prevention procedures—especially critical in heritage buildings containing combustible materials. UNOPS continuously monitors worksites, conducts safety briefings and toolbox talks, documents incidents, and enforces corrective actions to prevent reoccurrence. Through this structured approach, UNOPS maintains a safe working environment while safeguarding the integrity of cultural monuments and the well-being of everyone involved.

During the implementation of works, infrastructure project manager, lead construction management engineer and civil engineer were tasked with daily coordination and support as to ensure all the health and safety Measurements are met.

Furthermore and to increase the capacity of local contractors, regular tool box talks and training when it comes to risk management, health and safety and daily operations of conservation sites. For the case of conservation of Castle of Bashtova, additional training of the contractors was conducted in order to upgrade the craftspersons skills in masonry pointing and conservation.

8.5.2 Documenting and reporting

UNOPS follows a rigorous documenting during implementation. Documentation is done through following:

- Shared digital drive-based documentation system, where all data regarding the design, contract, meetings, reporting, daily photo documentation, are stored and available to the engineering team
- The documentation as well includes all segments related to environmental management, risk management, HSSE management, logs and inspections.
- Reporting as well is done on several levels:
- Initially biweekly, and later monthly reporting to donor
- Biweekly detailed progress reporting to donor and beneficiary
- Regular technical and coordination meetings with both donor, beneficiary, asset managers and similar
- Reporting in UNOPS field data collection platform (UNOPScollect system) where daily logs, daily and weekly HSSE reports are collected

8.6 Testing, Commissioning, and Hand-Over

Prior to final completion is declared by the contractor, together with supervisor UNOPS checks:

- The functionality of new MEP (Mechanical, Electrical, and Plumbing) systems: electrical panels, fire alarms, UPS, HVAC, CCTV, generators
- Structural integrity and stability
- Quality of surface finishes, floors, roofs, and restored masonry
- Compliance with fire and building safety standards

Once all remarks have been addressed by the contractor, the works are subject to inspection. UNOPS, together with the contractor, supervisor, the National Institute for Cultural Heritage, the relevant Regional Directorate of National Culture, the site beneficiary, and the site manager, jointly conduct the site inspection.In parallel, and following the final supervisor's approval, all project documentation is handed over to a commission, which issues the Commissioning Act. Once the Commissioning Act is issued, the site is provisionally handed over to the beneficiary. This moment also marks the start of the Defects Notification Period (DNP). The DNP for all sites restored under EU4Culture was 12 months, with the exception of one site, which was an emergency stabilisation and did not require a DNP due to the temporary nature of the intervention.

8.7 Final Hand-Over

During the DNP period, UNOPS conducts periodic inspections and coordinates between the beneficiary and the contractor in the event of any defects. At the end of the 12-month period, a final inspection is carried out. If there are no remarks, the final handover certificate is signed by all parties, marking the full completion of the works by UNOPS.

8.8 Overall Added Value of UNOPS Project Management

By applying its globally recognised project-management system, UNOPS ensured that all buildings benefited from:

- Transparency and international procurement standards
- High-quality heritage-compatible restoration
- Strong safety and risk mitigation
- Efficient use of EU4Culture funds
- Sustainable long-term maintenance frameworks

- Enhanced functionality while respecting historical authenticity
- Capacity building and knowledge transfer to national and local stakeholders
- Engagement of academic institutions and students through on-site learning opportunities
- Promotion of inclusive participation, including gender-balanced involvement of experts and professionals

UNOPS delivered projects that not only restored important cultural buildings but also strengthened institutional capacity for ongoing stewardship.

9. Acknowledgments

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