City of Kaštela – Living lab site for agricultural landscape restoration

HORIZON-NATURE-2027-02-02 · Area A or B, to be agreed with the coordinator · October 2026

City of Kaštela, Croatia · PIC 939046234 · Contact: Mili Jerčić, Senior Advisor for EU Funds, mili.jercic@kastela.hr, +385 21 205 256

1. Type and significance of the site

Site type

The Kaštela agricultural landscape stretches from the coastline of Kaštela Bay up the southern slopes of Mount Kozjak (779 m). Olive groves, vineyards and small plots are divided by dry-stone walls and terraces. Seven historic coastal settlements with about 38,000 inhabitants lie between Split and Trogir, and the plain between them and the mountain (the Kaštela Field) has been farmed for centuries. Twenty-four short, steep torrential streams run from Kozjak across the plain into the sea.

The southern slopes of Kozjak and Opor are built mainly of Eocene flysch, which is poorly permeable and drives rapid surface runoff. The upper slopes are covered by coniferous forests. The lower part of the catchments, the Kaštela Field, is predominantly agricultural land that has been under intensive urbanisation in recent years.

Significance

- The landscape keeps the high-diversity landscape features targeted by Article 11 of the Nature Restoration Regulation (EU) 2024/1991: dry-stone walls, terraces, field margins and old olive trees.

- The Kozjak massif is part of the Natura 2000 bird conservation areas (Kozjak, Mosor and the Trogir hinterland) and of the Important Bird Area "Mount Mosor, Kozjak and Trogir hinterland" (BirdLife).

- Two protected natural monuments lie within the City: the Old Olive Tree in Kaštel Štafilić, more than 1,500 years old, and the Common Oak in Kaštel Gomilica. Both are managed by the public institution More i krš.

- The site links mountain, agricultural land and sea within a few kilometres, so restoration can be tested along a full gradient: slope, plain, torrent, bay. The torrents also make the site relevant for restoring water connectivity (NRR Article 9).
- The City will set up a new living lab on these sites. Besides Area B, the site also fits Area A (building risk-resilience with restoration), given the flash floods from the 24 torrents and wildfire risk on Kozjak.

2. Current challenges and pressures

Torrential floods and erosion

Short, intense rainfall can make the torrent channels overflow within tens of minutes. The City's operational strategy (STRENGTH, 2026) reports partial destruction of roads and soil erosion during such events, and notes that areas closer to Kozjak are prone to landslides.

Loss of the Kaštela Field

The historic agricultural plain is under pressure from urbanisation and paving-over. The loss of absorbent soil speeds up runoff towards the coast and overloads the drainage system.

Fire

Forest fires on the Kozjak slopes are becoming more frequent. They reduce vegetation cover and increase erosion and landslide risk.

Land abandonment

Olive groves and dry-stone terraces on the slopes are being abandoned and overgrown.

Climate stress

Summer droughts and heatwaves affect olive groves, soils and protected trees.

3. Available data, monitoring infrastructure and resources

Monitoring

Bujica (www.bujica.com), developed under the STRENGTH project (Interreg Italy-Croatia, 2024–2026), is an early warning system for flash floods covering all 24 torrential catchments draining the southern slopes of Mount Kozjak. Five monitoring sites were installed in 2025 on a LoRaWAN network, with one rain gauge on NB-IoT for faster reporting:

- two full meteorological stations measuring rainfall, temperature, humidity, pressure, wind and solar radiation: Gospa Lurdska chapel in Kaštel Lukšić and the Malačka mountain hut on Kozjak
- three rain gauges: Kaštel Stari cemetery, Rudine recycling yard and Kaštel Novi cemetery

Data are reported every 10 minutes. Warning thresholds are based on a 2026 hydrological and hydraulic study of a reference catchment in Kaštel Novi (3.23 km^2), using LiDAR terrain data, Sentinel-2 land cover and the SCS-CN method, calibrated with surveillance camera footage of real events, and scaled to the other 23 basins. The full history of measurements and warnings can be exported as CSV. This gives a ready hydrological baseline for measuring the effect of restoration measures on runoff. The network can serve as part of the project's KPI and MRV (monitoring, reporting and verification) framework from the first day.

Data and studies

- Flood hazard report (STRENGTH D.2.1.2, 2026): rainfall-runoff model, land cover classification and channel capacity calculations, validated against events in December 2025 and January 2026.
- Web multi-hazard risk map (STRENGTH): flash floods, sea flooding and seismic vulnerability across 26 homogeneous zones.

- Guidelines for an operational strategy (STRENGTH D.3.3.1, 2026), including measure 3.2 (retention basins on the slopes of Kozjak and bio-engineering of torrential channels with native vegetation instead of concrete) and measure 3.3 (green infrastructure and protection of the Kaštela Field in spatial planning).

- City spatial plan, geodetic data and the City Coastal Zone Management Plan.

Institutional resources

Croatian Waters (water management), public institution More i krš (protected areas), University of Split Faculty of Civil Engineering, Architecture and Geodesy (author of the hydrological and risk studies), KAŠTELARA – Development Agency of the City of Kaštela, Kaštela City Museum, Kaštela Tourist Board, olive growers and family farms.

City experience

28 EU-funded projects since 2017, including STRENGTH (flood early warning), NEXTCAPE (nature-based flood adaptation in the Kaštel Sućurac heritage area, 2026–2029), PMO-GATE (flood and meteotsunami risk) and Hidden Habitats (interpretation zone at the Old Olive Tree, ERDF).

4. Expectations from the consortium and potential outcomes

Expectations from the consortium

- Nature-based measures in the upper parts of the torrential catchments and on the agricultural plain, building on measures 3.2 and 3.3 of the City's operational strategy: restoring terraces and vegetation cover, bio-engineering of channels and natural water retention.
- Use of Bujica rainfall data as a baseline and for evaluating the effect of these measures on runoff.
- Methods to assess the condition of the agricultural landscape and baseline measurement of biodiversity, soils and landscape features.
- Restoration measures co-designed with farmers and landowners: dry-stone walls and terraces, revitalisation of abandoned olive groves, field margins and hedgerows.
- Social sciences expertise on landowner motivation, incentive models and fragmented ownership.

Potential outcomes

- Restored pilot plots on the slope–plain–torrent gradient, monitored throughout the project.
- Measured effect of restoration on runoff, using the existing Bujica network.
- Integration of results into the City's Implementation Programme 2026–2029, the spatial plan and the City's agricultural support programme. The programme supports about 60 farms a year (€120,000 in 2026), and its next cycle from 2028 could reward restoration measures tested in the living lab, such as dry-stone wall repair, ground cover in olive groves and field margins.
- A replicable model for Dalmatian coastal towns with similar landscapes.

What the City offers

The City joins as a beneficiary with its own budget and hosts one full living lab with at least eight sites, combining City land and private farms. It provides access to sites on public land and support with permits, a local stakeholder network, co-design workshops with citizens and landowners, and uptake of results into City planning documents and agricultural support. KAŠTELARA, the City's development agency, can support the City as an affiliated entity in stakeholder engagement and project management.