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MULTICELLULAR SHEEPFOLDS *(MRGARI)* AS MONUMENTAL SHEPHERDS' DRY STONE WALL ARCHITECTURE: A CRES-LOŠINJ ARCHIPELAGO CASE STUDY

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Multicellular sheepfolds form part of the dry stone wall pastoral heritage in the UK, Switzerland, Iceland, and Croatia. Abandonment, and the marginal appearance of the ones on the islands of Cres and Lošinj (locally: *mrgari*) in the literature propelled this study, which aims at a more comprehensive research approach, starting from the premise of their cultural value. Site exploration

was based on a literature review, cartographic analysis, interviews with the local inhabitants, and field observations. Finally, multicellular sheepfolds are inventoried, described, and assessed within a brief evaluation model that supported a selection of those that are currently most representative and/or those most appropriate for renewal.

Keywords: *dry stone wall heritage, multicellular sheepfolds, mrgari, traditional sheep breeding, Cres-Lošinj archipelago, Croatian Adriatic*

INTRODUCTION

In the world of dry stone architectural heritage, one category to which special attention has recently been given are multicellular sheepfolds. Their distribution is associated with transhumance cultures and cooperative systems of common land and common pasture with the function of gathering, sorting, milking, shearing, marking, and inspecting livestock. In Croatia, they owe their popularity mostly to those from the southern part of the neighbouring island of Krk, with the local name of *mrgari*, which have become a tourist attraction[1] on the island and stand out in number, size, and aesthetic significance, mostly due to their flower-shaped aerial-perspective appearance (Figure 1). Sheepfolds of similar dimensions and shapes have been recorded on other Kvarner islands: Prvić (Horvatić 2000), Rab and Dolin (Frangeš 2012), and Pag (Kale 2012). Fučić refers to one of them as "the most monumental work of our shepherd's architecture" (Fučić 1998:181) and Kale emphasises the value of the multicellular sheepfolds in the embodiment of a sustainable solution of spatial management (Kale 2012:259).

According to currently available knowledge, multicellular flower-shaped sheepfolds can be found in only three other places in the world: in the province of Snowdonia in Wales (Johnson 1998), in Iceland (*réttir* [Aldred 2006]), and in Switzerland (*Färricha* [Gnesda 2020]). Other multicellular sheepfolds are common in the mountains of northern England and in Scotland, and it is most probable that, through further research, new examples will be found, given that they are a universally logical solution for collecting and sorting sheep on the commons.

[1] One of the sheepfolds became part of the cultural podium for the needs of the programme 'Rijeka - European Capital of Culture 2020', where the art installation 'Kapi' (Drops), which is the work of the architect Smiljan Radić and the sculptor Marcela Corre, could be seen. In May 2021, an exhibition of aerial photographs by Sanjin Ilić, called 'Drop by Drop, Stone by Stone – Life', was set up, along with a hiking tour that led to these structures. Also, representations of Krk sheepfolds are used as souvenirs included in the list of the Tourist Board of the City of Krk.

Figure 1: Flower-shaped multicellular sheepfolds on the island of Krk (Na Staroščini). (Goran Andlar, 2020)

Considering the islands of Krk and Cres' same practices in traditional sheep breeding, land ownership, and commons management, their large and almost exactly equal area (≈ 405 km^2), and the fact that Cres inhabitants intended and adapted most of their island for sheep, it is logical to assume that there should be a large number of similar structures, or at least more than previously recorded. Noted topic-relevant research commenced in 1945 with Jardas, who, collecting data on sheep breeding on the island of Cres, enclosed floor plans and photographs from some of the then-actively used multicellular sheepfolds (Jardas 1964). Houtzagers, while researching the Čakavian dialect among the Orlec inhabitants, apart from making relevant terminology more clear, transcribed dialogues with reference to practices in sheep breeding (Houtzagers 1985:181, 188). Stražičić (1981:207–217, 248–252) explains further sub-terminology and records the number of sheep and inhabitants per shepherd's dwelling (for the 19th and first half of the 20th century). Further contributions are especially found in the works of ethnologists: Pavlovsky (2001, 2000), Jurkota Rebrović (2009), Gović (2011). Frangeš et al. (2015) inventoried certain sheepfold locations for the Town of Mali Lošinj.

Thus, multicellular sheepfolds of this area (locally: *mrgari*,[2] N. pl.) have not been neglected in the local literature, but so far, they have been approached only partially and mostly from the perspective of their function as an economic facility. Over time,

[2] The word *mrgari* will be used as a name for the sheepfolds of Cres and Lošinj, even though the word is mostly used in its dialectal variants.

mrgari became part of the vernacular architectural heritage, maturing to an object of research that is to be approached from a cultural, rather than economical, standpoint.

Traditional sheep breeding practices on the island of Lošinj were the same as those on Cres (Pavlovsky 2000:109), not lagging behind even when it came to livestock count (Stražičić 1981:211). However, the island of Lošinj had turned a large part of its pasture areas into terraces for vineyards and olive groves and directed its economy to maritime and trade, thus drastically reducing the traditional farming intensity, which has made it less representative in this context. Lošinj was, therefore, included only due to a single but prominent example. The number of sheep on Cres has also declined by half since the early 1900s, with recent estimates of 15,000 (Centar za stočarstvo 2021:35). Due to sheep breeding becoming an ancillary activity, the abandonment of the traditional way of communal grazing, and the switch to new sheepfolds made of farmer's mesh and wooden stakes, the need for dry stone wall sheepfolds has been reduced and today most of them are abandoned. The above-mentioned observations directed the main thread of this work, which aims at a more comprehensive approach, synthesising previous knowledge and complementing it with data made available by recent technology.

AIMS, METHODS, AND MATERIALS

This paper will give an assessment – inventory and evaluation – of a large proportion of the multicellular sheepfolds in the area of the Cres-Lošinj archipelago. The results are based on combined desk and field research. Deskwork included the collection and review of local and regional historical, ethnologic, and geographic sources, professional studies, cartographic sources, as well as the international literature on equivalent structures in Europe. Dry stone wall multicellular sheepfold site exploration was based on a review of digital orthophotos (henceforth DOF, from 1953 and 2011–2020), Croatian Base Map (henceforth HOK, 1979–1986–1988),[3] and Austrian Empire cadastral maps from 1821,[4] which were consulted for historical reconstruction. However, free and semi-structured interviews with the local population from the island of Cres and joint field visits contributed most to the research. The

[3] HOK is the acronym for Croatian Base Map (*Hrvatska osnovna karta*, HOK79, HOK86, HOK88) and DOF for digital orthophotography *(Digitalni ortofoto)*, i.e., aerial imagery (DOF53, DOF2011, DOF2020), all available on the geo-portal of the Croatian State Geodetic Administration: https://geoportal.dgu.hr/ (accessed 2 July 2021).

[4] Available in the digital repository of the State Archive of Trieste (Archivio di Stato di Trieste [s. a.]) (accessed 5 July 2021).

interlocutors are predominantly middle-aged and elderly sheep breeders, either retired or still active.

Multicellular sheepfolds were recorded by geo-tagged terrestrial and aerial photography taken in 2020 and 2021. Unless stated otherwise, all photographs are the author's (T.K.), taken in 2020 and 2021, with the permission of the rightful owners or occupants. Due to the observed 'dronogenicity'[5] of the structures, more emphasis was placed on aerial photographs. Based on field observations and available information, these structures went through a brief evaluation model by which they were summarised and georeferenced within the GIS environment (Figure 31), which resulted in a selection of those most apt for potential renewal and public presentation. The evaluation model took into account ease of access, level of preservation, aesthetic value, and the willingness of owners or users to support presentation or renewal. The latter criterion was included since a conservation model, if such would be deemed apt to implement, should be tailored together with the local community. Aesthetic value in this context is guided by the following elements: size, recognisability, complexity of form, associative shape, construction quality, and a prominent or distinguishing setting. Aesthetic value should be considered from a pedestrian perspective as well, but the bird's-eye view more successfully conveys the entirety of these structures – most of which are not even noticeable from the ground. Scores have been given with the Cres-Lošinj archipelago as the geographical context, and not beyond.

RESULTS

Notes on locations, forms, etymology, and practices

A sheepfold, i.e., locally *margãr, mergãr* or *marguãr,* is a fairly small dry stone wall enclosure located in the corner of a private pasture (*ogrâjica,* N sg.[6]) or a common (*komunâda,* N sg.). These simple sheepfolds are the most frequent type, usually constructed with single dry stone walls *(ūnjulica)* (Figure 2).

The entrance to a *mrgar* is through an opening in the wall *(lâz)*, which can be closed with a wooden door (*lẽsa* or *zãtoka*). More important sheepfolds are paved, constructed with double walls *(dụ̀plica)*, and may have a niche for tools or paint (Figure

[5] The usage of the term 'dronogenic' was inspired from correspondence with Filip Šrajer, who also used the term in the context of multicellular sheepfolds.

[6] *Ogrâjice* (N pl.) is the local name for private pastures on the island of Cres, identical to Krk's *drmuni* and Rab's *ograde*. Tramuntana region, the terms *ogrãdi* and *umė̀jci* have also been used (Jardas 1964:106).

Figure 2: A large one-cell sheepfold in the communal pasture of Stivan (2021)

3). Less often, the term *mrgar* denotes a roofed dry stone barn (Konestra 1997:61).

The term has a Latin origin (*mulgĕo, mulgāre, mulgarium* [Olivetti 2003]) and denotes milking or a milking pail. Diachronic linguistic change is explained by consonant assimilation (sound change) of **l - r** > **r – r**, resulting in *mu**l**ga**r**e* -> *mu**r**ga**r**e* (Skok 1972:476). *'Mu**r**gar'* then becomes *'mrgar'*. In some places, *'mrgãr' 'margãr'* ***or*** *'mergãr'*, following a common Čakavian replacement of the syllabic ***r*** with ***ar*** or ***er*** (Horvatić 2000:100).[7] Dialectal variants on the archipelago are *mergãr* (N pl. *mergarị,* L sg. *mergarė*) (Houtzagers 1985:294) used in Cres,[8] Loznati, Orlec,[9] Belej, and Srem; *margãr*, used in Tramuntana and Ustrine; *margarịć*, used in Osor (according

Figure 3: One of many small one-cell sheepfolds on the island of Cres, but with the distinction of the pavement with škrĩji and a niche for tools (the environs of Osor [Mikaskegarine], 2021)

[7] Horvatić's explanation of diachronic linguistic change of the word was used for the island of Krk but is applicable to Cres as well, considering their historical and linguistic similarities.

[8] Tentor ([1907] 2020) uses the *margâr* variant for the town of Cres.

[9] Pavlovsky incorrectly mentions that Orlec inhabitants use the *margãr* variant (Pavlovsky 2000:109).

to Pavlovsky 2000, 109); and, with a diphthong, *margu̯ar*, which is used in the region of Punta Križa and in Nerezine.

Despite the creation of multiple partitions and thus the addition of functions beyond just milking, multicellular sheepfolds, as a whole, maintained the name and the singular form – *mrgar*. They are logical, slightly more complex, solutions for the sorting of sheep from larger pastures. Sheep are sorted according to various criteria, such as ownership (by making ear stamps [*belẽzī*]) or colouring them (*bu̯la, senjãl*), or by activity (milking, shearing [*strîh*], tick removal [*čepẽrenje*]), or by age and sheep purpose (rams, lambs, older sheep [*stãrka*], etc.).

Larger pastures are part of historical feudal island economies – shepherd's dwellings *(stâni)* and their agricultural lands or a part of the commons. As part of *stâni,* they can be found either right next to the shepherds' dwellings (e.g., Matualda, Batajni, Sv. Vid, Grabrovice [Jovović 1993] etc.) or further away (e.g., Jedro, Loze, Konac).

The multicellular sheepfolds of the Kvarner islands, including the islands of Cres and Lošinj, follow a similar logic. Each must have a larger designated space where all the sheep are first gathered. On the islands of Krk *(sala)* and Dolin *(zagon)*, they are round and located in the middle of the sheepfold, from where sheep are then filtered into the smaller pens that surround it (*mrgarići* on Krk, *mošuni* on Dolin), thus creating an associative flower shape. On Cres, the authors found no specific name for the largest inner cell.[10] A similar yet wider and partially delimited area is called a *pregrãjčić*. The outer enclosed spaces are sometimes called *pe̯rzgari* / *pa̯rgaji*. Each *przgar* has its lunky hole *(šku̯ja)* through which the sheep are then released back to pasture.

Flower-shaped multicellular sheepfolds could only be found on the island of Lošinj. Topography permitting, the sheepfolds of Cres follow a more orthogonal floor plan shape Mihojski, Betkav, Tarbijanšćica, Ustrine - new, etc.) enabling 'labyrinth-like' movement, but also irregular (Sv. Vid - Plasa, Jedro, Ustrine – old, Batajni) or elongated forms (Matualda, Lovreški). Also, unlike sheepfolds on Krk, which mostly consist of single walls, a large number of those found on the archipelago are built with solid coped double walls. These are associated with ecclesiastical (Lovreški, Matualda) or feudal estates (Sv. Vid, Lovreški, Veli Tržić). These estates had an established stocking rate of sheep on their pasture and there was no need for frequent reconstructions of the dry stone walls, as was the case on Krk, where pastors, owners, or users often changed the shape (floor plan) of sheepfolds according to the current needs (Horvatić 2000:94).

Because of nationalisation after WWII, a great number of the currently preserved multicellular sheepfolds are being used by the Agricultural Cooperative Cres. From

[10] In conversation with interlocutors, sometimes would be addressed as *'dvor'* or *'veli margar'*.

the end of the 19th century until the 1950s, some of the shepherds' dwellings were bought by inhabitants of Cres or Lošinj (Pavlovsky 2000:110) and are now in private ownership.

Sheepfolds should preferably be paved for sanitary purposes. Historically, paving has been achieved with stone pebbles or thinner and flat limestone *(škrîji)*. Concrete has only been used in the Hrasta sheepfold for the needs of a former cheese factory. Due to the narrowness of the traditional paths lined by dry stone walls, some of them became improvised sheepfolds, additionally fenced with farmer wire or mesh.

Multicellular partitions

Przgar

In the (non philological) literature the term has been registered as *przgar* (Jardas 1964, 128; Stražičić 1981, 212). However, local dialect does not use the syllabic 'r'. Instead, in front of 'r' a vowel 'a' or 'e' is placed[11], and it is how it has been used: *pėrzgal* - Orlec (Houtzagers 1985, 321), Valun (Desanti, 2003); *pėržgalj* - Belej (Konestra 1997, 61); *pȧrgaj* – (Ustrine); *pėrzgaj* (Srem), *pėzgar* (Vidovići); *parnjãč* (Tramuntana). In this paper, all dialectal varieties will be uniformly addressed as *przgar*.

A *przgar* is a sheep pen with two functions: enclosing stray sheep and sorting lambs or sheep according to their owners.

> There are always sheep that are very restless and jump over the stones, however high they might be. A sheep that enters someone else's pasture should not be killed or taken but should be brought to the village and placed in *'pržgalj'*, a small enclosed space close to the house, where its owner would come to pick it up, recognizing it by a special mark on its ear. (Konestra 1997:61; informant: Ivan Benvin)

Therefore, the main function of a *przgar* is to enclose (*'sterdi̇t / stardi̇t va pėrzgal' = 'enclose in a przgar'*) a stray sheep – a sheep that does not belong to the pasture in which it was found – which was to be anticipated due to the mosaic arrangement of the Cres communal and private pastures and the sheep's ability to cross walls.[12]

Outside of the villages, within the multicellular sheepfolds, the floor plan of a *przgar* is usually circular or semi-circular (unlike other multi-cell sheepfold compartments;

[11] We thank Bernard Balon for the conversation on the local dialect pronunciation.

[12] For the same reason, the dry stone walls of the archipelago, but also along the Croatian Adriatic

Figure 13, Figure 26) and higher than the rest of the dry stone walls, with a *škụ̀ja* as the only exit.[13]

Figure 4: Mrgar (left) and przgar (right) in Kraji, north of Osor, attached one to another. The mrgar on the left has a passage (škụ̀ja) at the bottom (not visible in the photograph as it is closed with stones) (2021).

Strigar

Jardas writes that a "*[m]rgar* for shearing is divided into several smaller spaces, namely *strigar*, in which the shearing is performed, and 3-4 *przgari*, which are considerably smaller, and are designated for lambs. Larger *mrgari* for shearing have six compartments" (Jardas 1964:126). In the "*mrgari* for shearing" formulation, the full transfer of function can be noticed – these multicellular mrgari do not serve for milking but still bear the original name. Within the multicellular sheepfold, the *strigar*[14] is the biggest one. The name comes from the word *strîh (N, sg., strị̀ga G, sg.)*, which is a local term for shearing. The shearing of sheep is preferably completed within one day. For this reason, shepherds from neighbouring *stâni* come to assist, as this work is regularly done voluntarily (Figure 5) (ibid.:128).

coast in general, are sometimes reinforced with horizontally laid stones *(õzubi)* that protrude about 30 cm outside the dry stone wall.

[13] Etymologically, it could be associated with a prison *(peržūn)* for stray sheep. Local author Marijan Desanti tried to explain the etymology by connecting it to *prkat*, which means 'a small room' but which is not part of the local dialect; then *prkatorij*, or rather *purgatôrij* (purgatory), which has some footing in reality, since the stray sheep at times might stay in a *przgar* for days in inadequate conditions. While Desanti did not resolve the etymological dilemma, he did conclude that "the poor animal is being punished for no reason, as it is created free to seek according to its need both good and fresh pasturage. What does she care if the people built fences, dry stone walls…" (Desanti 2003).

[14] The interlocutors included in this research were not acquainted with the term *strigar.*

Figure 5: Separating sheep before shearing (left) and the shearing process in the multicellular sheepfold of Batajni (right). Photographs taken by Franjo Jardas in the 1950s.

Pregrajčić

Pregrãjčić is the name for the semi-delimited entrance area to a *mrgar*. It is needed since the sheep are reluctant to enter confined spaces. This compartment lacks a dry stone wall at the entrance side (see: Figure 13 and Figure 26).

Multicellular sheepfolds of Cres and Lošinj: An inventory and evaluation

Here follows a list of the inventoried and assessed multicellular sheepfolds. Multicellular sheepfolds whose descriptions were outside the scope of this paper (Grabrovice, Batajni, Matualda, Loze) have been included in the final map (Figure 30).

1. The multicellular sheepfold of *stân* Konac

Figure 6: Vegetation cover impeding aerial photography of the Konac sheepfold (2021)

This sheepfold is located along the gravel road that leads to the Konac dwelling. Abandonment and vegetation overgrowth did not enable representative photography, but the structure is still maintained, partially due to its solid construction of double walls. It has an area of 428 m^2 and 8 partitions (Figure 6).

	Evaluation 0-5	Result
level of preservation	4	3.25
accesibility	3–4	
aesthetic value	3–4	
cooperation on the field	2	
HTRS	**E** 329354.58 **N** 5004640.41	

Table 1: Evaluation of Konac margãr

2. The multicellular sheepfold of Tarbijanšćica

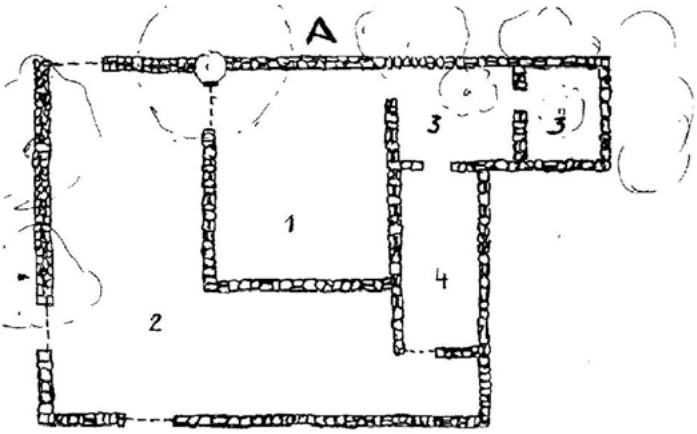

Figure 7: Tarbijanšćica margar layout by Jardas (1964).
Numbers: 1 strigar, 2 area for shorn sheep, 3 przgar, 4 unshorn sheep.
This ground plan is barely recognisable in the field.

This multicellular sheepfold is imposing in size – based on measurements from cadastre it has a total area of 1,154 m^2 and capacity for 3,000 sheep. It is located in the Tramuntana forest on the northern part of the island of Cres, on the toponym Tarbijanšćica, accessible by off-road vehicle. It is separated in the cadastral registry from the pasture to which it belongs with the local term *'Margari'*. The double wall construction is relatively well preserved but is quite imbued with vegetation (Figure 8). A clear overview and its labyrinthine floor plan are given in the draft by Frane Jardas (Figure 7).

Figure 8: Current state of the Tarbijanšćica sheepfold (2020)

	Evaluation 0-5	**Result**
level of preservation	3	3.375
accesibility	2–3	
aesthetic value	4	
cooperation on the field	4	
HTRS	**E** 331433.86 **N** 5003816.09	

Table 2: Evaluation of Tarbijanšćica margãr

3. The multicellular sheepfold of *stân* Jedro

Figure 9: The advanced stage of degradation of the Jedro sheepfold, symbolic of Tramuntana as a neglected area of specific climatic and vegetation features (2020)

It is located 90 m south of the shepherds' dwelling Jedro and is accessible by off-road vehicle from the direction of Beli. The fact that only the outlines of this *margãr* remain, delimited by living rock and the moss that is taking it over, convey the reality of Tramuntana – the harshness of its terrain, the humid continental climate, and the advanced stage of overall abandonment (Figure 9).

	Evaluation 0-5	**Result**
level of preservation	1	1.625
accesibility	2–3	
aesthetic value	2	
cooperation on the field	1	
HTRS	**E** 330561.1 **N** 5004151.53	

Table 3: Evaluation margar of Jedro margãr

4. The multicellular sheepfolds of *stân* Sveti Vid

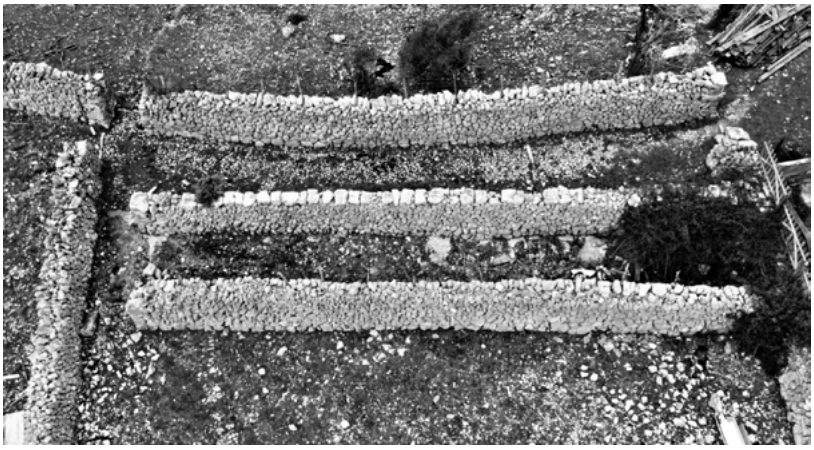

Figure 10: One the multicellular sheepfolds of Sveti Vid, designated for milking (2020)

The Sveti Vid *stân* had 25 inhabitants in 1945. This number dropped to 9 in 1961, which was the last year it had residents (Stražičić 1981:215–216, 248). One of the two sheepfolds, designated for milking, is located right next to the residential buildings, today's hunting lodge, in the form of two longitudinal structures 18 m long and of an area of 2 x 125 m^2, and with a capacity for 200 sheep (Figure 10). Utilitarian architectural details speak of wealth and long-term production: the *mrgari* are paved with pebble stones *(kôguli)* and transverse tone blocks. The dry stone walls are covered with capstones and constructed with double walls.

Sheep shearing took place in the second part of this multicellular sheepfold, located in the valley below (Plasa) with an area of 600 m^2 and with a capacity for 800–900 sheep. Today, it is in active use by the Agriculture Cooperative Cres. It was built mainly of double dry stone walls, reinforced with mesh (Figure 11).

	Evaluation 0-5	Result
level of preservation	5	4.25
accesibility	5	
aesthetic value	2	
cooperation on the field	5	
HTRS	**1 E** 339128.28 **N** 4982542.77 **2 E** 339035.04 **N** 4982700.13	

Table 4: Evaluation of the Sveti Vid mergār

Figure 11: Aerial footage of the visible part of the sheepfold in the valley below the Sveti Vid dwelling (2020)

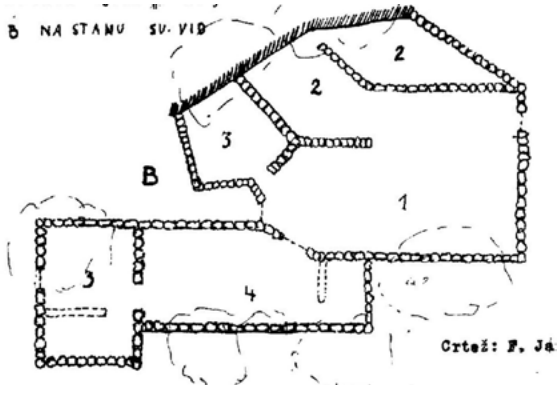

Figure 12: The mergār in the valley below the Sveti Vid dwelling, drawn by Frane Jardas (1964)

5. The multicellular sheepfold in Dražica

Figure 13: The Dražica sheepfold with nine enclosures. In the upper left corner of the photo, the dry stone wall terracing is visible – stones from the terraces became part of the single walls of the new sheepfold. The long dry stone wall on the left served as a tres – a wall along which the sheep were driven to the sheepfold. The parking lot probably served as a pregrajčić. The przgar is located in the middle (the round enclosure with vegetation) (2020).

Cres Bay is surrounded by an area of about 21 km^2 of dry stone wall lined fields and olive grove terraces, which is why the location of this multicellular sheepfold stands out. It testifies to the strategic functional upgrade of the Cres olive grove from an agrarian to an agro-pastoral system of use (Kremenić et al. 2021). After WWII and the drastic demographic decline, maintaining such a large olive grove was not possible, so, in the mid-1950s, the Agricultural Cooperative decided to place sheep in the olive grove after a good experience of such a system in another island site where sheep entered accidentally. Several dry stone wall additions had to be introduced, including the construction of three sheepfolds,[15] of which only the one in Dražica is preserved (Figure 13).

This sheepfold is situated next to what is today a beach and a promenade (although most of the people passing by are not aware of it; this structure has been missed in HOK as well) because it needed a port from which shepherds would transport lambs to the town centre. This sheepfold is no longer in use, although there have been attempts to reactivate it in the last 10 years that, however, have been unsuccessful due to the movement behaviour of sheep and their reluctance to change their usual route.

[15] A similar sheepfold existed on Gavza and another one on Karaula. Both are demolished, the first for a pathway and the latter for touristic infrastructure.

Figure 14: Dry stone details of the multicellular sheepfold of Dražica. Left: an entrance to the przgar through the škuja. Right: The dry stone walling is here done in a combined manner, the lower part constructed with double walls and the upper with a single wall, i.e., the 'Galloway wall' (2020).

	Evaluation 0-5	**Result**
level of preservation	4	4.5
accesibility	5	
aesthetic value	4	
cooperation on the field	5	
HTRS	**E** 334522.83 **N** 4981325.88	

Table 5: Evaluation of the Dražica mergār

6. The multicellular sheepfold on Betkav

Figure 15: The multicellular sheepfold of Betkav was additionally partitioned after 1953.

This six-cell ‘labyrinth’ sheepfold (Figure 15 and Figure 16) is located on the plateau Betkav above the Cres olive grove. The entrance is part of a former road lined by dry stone walls. It is built either with single walls or in a combined manner. Before 1953, four partitions were visible, after which two new walls were built, suggesting its use in the 2nd half of the 20th century. The surrounding pasture is being used by the cooperative, but the sheepfold itself is not in use.

Figure 16: "This labyrinth-shaped sheepfold is mostly built of a single wall or in a ‘Galloway wall’ manner (2020).

	Evaluation 0-5	**Result**
level of preservation	4	3.875
accesibility	2–3	
aesthetic value	4	
cooperation on the field	5	
HTRS	**E** 335236.27 **N** 4978887.64	

Table 6: Evaluation of mergãr Betkav

7. The multicellular sheepfold in Lovreški

Figure 17: Of an elongated shape, which, in the southern part of the island of Cres is call "kanu͡al" (2021).

With an area of approximately 140 m^2, this multicellular sheepfold has always been in ecclesial ownership. Its most recent use is connected to the cheese factory in Loznati, and today, it is used by the shepherds from the Agricultural Cooperative Loznati. It is easily approachable by gravel road from the village of Loznati.

Figure 18: The construction quality (double walls) and active use have resulted in its preservation (2020).

	Evaluation 0-5	**Result**
level of preservation	5	4
accesibility	4	
aesthetic value	2	
cooperation on the field	5	
HTRS	**E** 337423.49 **N** 4978131.5	

Table 7: Evaluation of mergãr Lovreški

8. The multicellular sheepfolds of Ustrine commons

Figure 19: Sheepfolds of the Ustrine common from aerial photogrammetric documentation from 1953. The margãr marked 1 is the older one. The newer one still did not have its current partitions at the time.

Two multicellular sheepfolds of the Ustrine village common (*komunâda* or *kuminâda*) of 2 km^2 were built throughout history. The common's area is about 2 km^2 and can accomodate 300-400 sheep. The construction of the more recent one was conditioned by the road, which passed through the southern part of the communal pasture, being surfaced with concrete. In 1953, it was still a one-cell sheepfold (Figure 19).

The older sheepfold is constructed with double walls and has an irregular ground plan form (Figure 20), which could partly be attributed to its age and to the morphology

Figure 20: Irregular organic contours of the older margãr of Ustrine common (2021)

of the terrain. The southern *pȁrgaji* of this sheepfold are probably functionally associated with the nearby *malžȉćarica* – aerial imagery shows how the dry stone walls of these pastures are directed to the sheepfold (Figure 19).

Figure 21: Details of the Ustrine commons older sheepfold: sheep passages (škȕje) and the right partition wall fixed with capstones (2021)

	Evaluation 0-5	**Result**
level of preservation	3–4	4.375
accesibility	4–5	
aesthetic value	4–5	
cooperation on the field	5	
HTRS	**E** 334118.37 **N** 4957962.92	

Table 8: Evaluation of Ustrine's older margãr

Figure 22: Left: from the feuilleton of Novi list (Gotthardi 2013) in which Dinko Rukonić, from Ustrine, on St. George's day in 1997 (the first day of milking), places a blessed olive branch, with a red cloth against spells. Right: Ustrine margãr in active use (Nadir Marković 2009).

The younger sheepfold of Ustrine is the only Cres sheepfold that has been reported in the literature and journalism (Figure 22). It is of rectangular disposition with the usual spatial organisation: the sheep are first gathered in the corner of a fenced pasture, and then placed in the inner largest partition, where the shearing was done (Figure 23). The five peripheral compartments *(pȁrgaji)* in which sheep of different sheep families were placed became a necessary spatial solution only after 1953. Each family was in charge of building their own *pȁrgaj*.[16] This sheepfold was used until recently, and in conversations with its recent users, nostalgia and a reluctance to abandon this traditional activity is evident.[17]

	Evaluation 0-5	**Result**
level of preservation	4	4.625
accesibility	5	
aesthetic value	4–5	
cooperation on the field	5	
HTRS	**E** 334310.87 **N** 4957997.08	

Table 9: Evaluation of the new Ustrine margãr

Figure 23: Only the right rounded section is part of the original sheepfold (2020)

[16] In talks with informants, it was stated that the more kilometres you built of the perimeter dry stone wall of the *kuminada*, the more sheep you could keep on pasture.

[17] The people gathered around the association 'Tunera' from Ustrine proved to be very enterprising heirs of their own rural environment (a "heritage community" as defined in the *Council of Europe Framework Convention on the Value of Cultural Heritage for Society*; see Council of Europe 2005). Through the work of the association, the village is represented through a multitude of educational boards and marked paths. The common space of the association can be considered a small ethno-museum.

Figure 24: The pȁrgaji overgrown in vegetation despite a relatively recent abandonment (2020)

9. The multicellular sheepfold Mihojski

Figure 25: The two upper partitions are currently the only ones in active use (2020).

This 550 m^2 big multicellular sheepfold is located within a pasture known as Mihojski or Mikaljski and easily accessible from the main state road on the island (D101). It is today in active use by the Agricultural Cooperative Cres (Figure 25) and one of the most representative since it still has most of its compartments and construction details.

Figure 26: The pregrãjčić is the wider space at the entrance to the mrgar, visible on the left side of the photograph. Two przgari are visible; the left one belong to the Mihojski sheepfold (2020).

	Evaluation 0-5	**Result**
level of preservation	5	5
accesibility	5	
aesthetic value	5	
cooperation on the field	5	
HTRS	**E** 335141.07 **N** 4956425.99	

Table 10: Evaluation of the Mihojski margãr

10. The multicellular sheepfold close to Veli Tržić

Figure 27: Half-flower shaped eight-cell sheepfold of Lošinj (2021)

This abandoned multicellular sheepfold is located 900 m SW of Veli Tržić, at the foot of the mountain Osoršćica, on the island of Lošinj. The construction details suggest this sheepfold was part of the Veli Tržić dwelling, although the dwelling has other sheepfolds right next to the buildings. Its solid double wall (Figure 29) and a ground plan of a halved flower resemble those on the island of Dolin and Krk (Va Pothlamac). Internal partitions were also recorded on the Croatian Base Map, where the entrance to the main hall, located between the outer 'petals' on the SW side, is perhaps most clearly recognisable (Figure 27).

The sheepfold is too big (650 m^2) and too complex to be tied only to the pasture to which it belongs (Figure 28) and was probably part of the greater pastoral area of almost 3 km^2, which, in the cadastral maps, is named Stenice. The small immediate pasture probably served as a *pregrãjčić*. This sheepfold is not accessible for non-mountaineers, however, and an old path lined by dry stone walls leads to it, which could become part of the network of marked and maintained hiking trails below it, taking into account the current active engagement of the Tourist Board of the Town of Mali Lošinj.

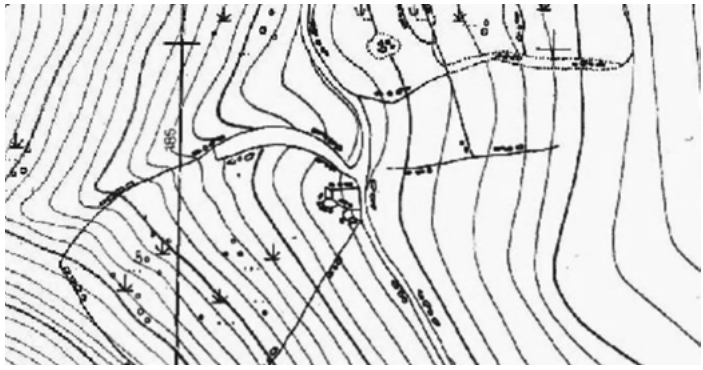

Figure 28: Visible contours of the sheepfold on Croatian Base Map (1986)

	Evaluation 0-5	**Result**
level of preservation	4	3.375
accesibility	1	
aesthetic value	5	
cooperation on the field	3–4	
HTRS	**E** 331317.66 **N** 4950645.1	

Table 11: Evaluation of Veli Tržić ***margûar***

Figure 29: One of the sheepfold compartments; photo representing the massive double dry stone wall (2021)

CONCLUSIONS

The most quoted sentence in heritage preservation is: "Through interpretation, understanding; through understanding, appreciation; through appreciation, protection" (Ham 2009:50). In the context of dry stone wall shepherds' heritage, Cres and Lošinj still have work to do in the first part of this formulation. These first steps have been the purpose of this work – to reverse the direction that has been marked by vegetation succession and abandonment by revealing the neglected part of this pastoral dry stone wall heritage and, in doing so, creating a basis for subsequent management.

This paper presents a register of the multicellular sheepfolds of the islands of Cres and Lošinj (Figure 30). Most of them are larger than 500 m^2. Besides the Jedro sheepfold, all of them are in a good state of preservation; however, abandonment is evident both from the vegetation cover and the lack of recollection in the communities. A comparison with the island of Krk shows variety in construction: on the island of Cres, not all communal sheepfolds are multicellular (the commons of Belej, Stivan, Grmožaj, etc.), they are more often built with double dry stone walls, and they do not follow the recognisable flower-shaped form.

By reviewing eleven of the more prominent multicellular sheepfolds of Cres-Lošinj and evaluating the available criteria, five of them were singled out as those most suitable for renovation and/or presentation to the public. Despite a lower total score,

the sheepfold of Veli Tržić was included for the sake of its rarity and placement near the well-marked tourist and mountaineering area of Osoršćica mountain.

1. Multicellular sheepfold of Mihojski (5)
2. Multicellular sheepfold of Ustrine – new (4.625)
3. Multicellular sheepfold of Dražica (4.5)
4. Multicellular sheepfold of Ustrine – old (4.375)
5. Multicellular sheepfold of Veli Tržić (Ograja) (3.375)

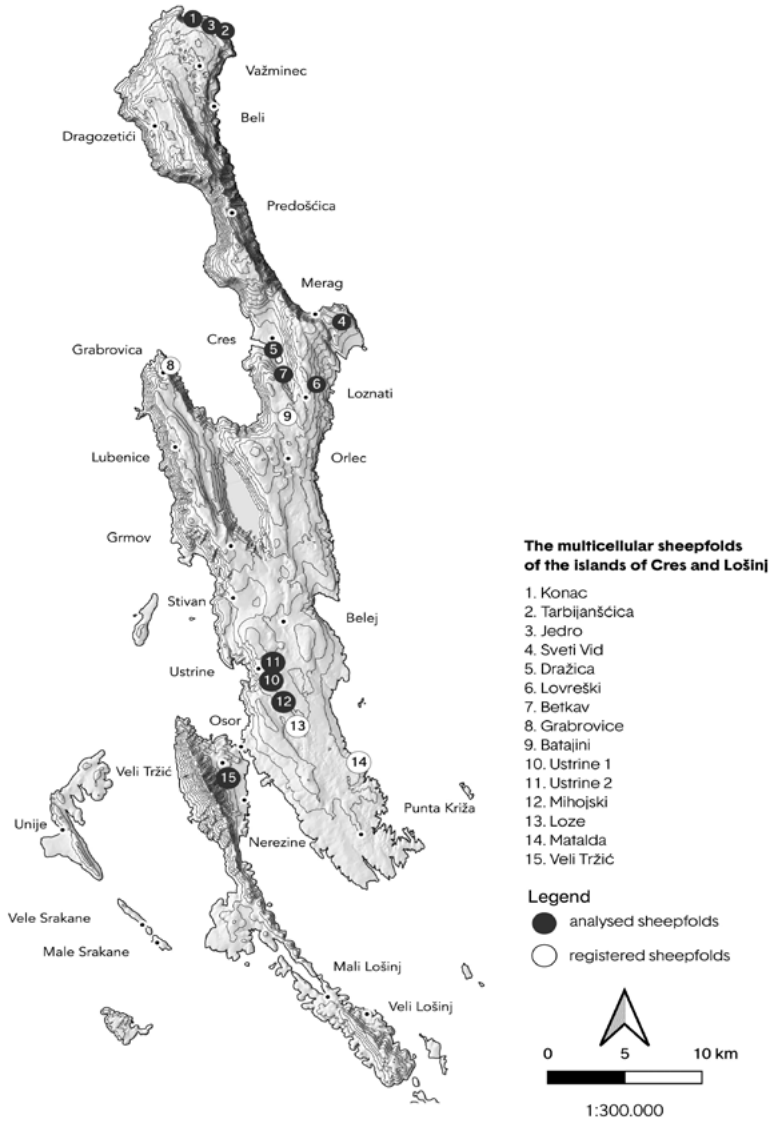

Figure 30: Map of the registered multicellular sheepfolds on the islands of Cres and Lošinj

Figure 31: Preview of the GIS database using the example of the Mihojski sheepfold

The evaluation criteria can certainly be subject to modifications, which will depend on spatial changes and new research. For example, 'accessibility' and 'potential cooperation' are subject to change, 'aesthetical value' may be subjective, and the weight given to the criteria may vary, e.g., if there is no willingness in the field to preserve the structure, do the other criteria matter? The 'historical significance' criterion was subsequently excluded since age, as a criterion, is still considered a matter of debate – is something that is extremely old more valuable than more recent achievements, the ones that the population feels connected to and can relate to? Secondly, it is difficult to determine the time of sheepfolds' construction prior to 1953. The Austrian Empire Cadastre, one of the most valuable historical cartographic sources for this area, does not register these structures as a separate category. The chronology of the internal sheepfold partitions can only be traced by looking at orthophotos and maps from 1953 (DOF68), 1979-86-88 (HOK), and the 21st century (DOF2011 - 2020). Research from neighbouring islands could not date these structures as more than 100 (Horvatić 2000:97–98) or 170 years old (Kale 2012:259). In England, a review of historical maps and currently available photographs yields similar conclusions – the

number of sheepfolds increased, and they were additionally enclosed in the late 19th and early 20th centuries. It can be assumed that on Cres, the older sheepfolds are the ones belonging to the shepherds' dwellings, while the sheepfolds on the commons could be younger, built only with the increase in the population during the 19th century.

Customs are a social act (Gotthardi 2013) and, because of milking and shearing, sheepfolds were places of joint performance of duties and accompanying socialising,[18] the only places of social cohesion in the wastelands of the former *Arabia Petraea*,[19] today's *Arabia Juniperus* (Sokolić 1999). The economically conditioned temporality of these structures and their current stage of neglect and disintegration need not necessarily be understood as an obstacle. Indeed, they could again become points of social cohesion of a different kind – during their joint restoration by dry stone wall teachers and young enthusiasts, a generational gap can be bridged and a direct connection between grandparents and grandchildren established.[20]

Finally, multicellular sheepfolds help us to understand historical and contemporary social processes (see: Kale 2012:260). Therefore, one should, when stepping through the Cres pastures and coming across a sheepfold, either an uncompounded or a multicellular one, look up and around, because sheepfolds summarise and convey a much larger material-immaterial historical and present space than one might first realise.

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[18] See also: Badurina Dudić 2006:31.

[19] Transl. "a rocky desert" – a name used by the locals for the barren commons in the middle part of the island of Cres (Fortis [1771] 2014:125).

[20] See interview with Filip Šrajer and the experiences from Association Dragodid's workshops restoring the dry stone walls on the Croatian coast in Srdoč (2020:27).

and Agricultural Cooperative Cres for the sheepfolds of Betkav, Dražica, Sv. Vid, Mihojski, Tarbijanšćica, and Orlec.

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Supplementary material:

- Figures (1-31)
- Tables (1-11)

Photographs were obtained with the permission of the rightful owners or occupants: multicellular sheepfolds of Konac, Betkav, Dražica, Sv. Vid, Mihojski, and Tarbijanšćica are taken with the consent of the Agricultural Cooperative Cres; multicellular sheepfolds of Lovreški with the consent of Agricultural Cooperative Loznati; Veli Tržić with the consent of Marcelino and Silvana Zorović; and Ustrine commons with the consent of the informants from Ustrine, Mikaskegarine with the consent of the Desanti family, the Stivan sheepfold with the consent and guidance of Boris Belašić.

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Višeprostorni suhozidni torovi *(mrgari)* kao monumentalna pastirska arhitektura: primjeri s cresko-lošinjskoga otočja

Tanja Kremenić

Mauro Varotto

Goran Andlar

Višeprostorne ovčare dio su suhozidne pastirske baštine Ujedinjenoga Kraljevstva, Švicarske, Islanda i Hrvatske. Primjeri s otoka Cresa i Lošinja (lokalnoga naziva: *mrgari*) u procesu su napuštanja, a u literaturi tek parcijalno obrađeni, zbog čega je cilj ovoga rada objedinjavanje i dopuna spoznaja, polazeći od premise o njihovoj kulturnoj vrijednosti. Istraživanje se temeljilo na pregledu literature i kartografskih podataka, ali ponajviše na razgovorima s lokalnim stanovništvom te terenskim obilascima. Ovim je radom većina otočnih višeprostornih *mrgara* zabilježena i opisana te vrednovana unutar modela kojim su izdvojeni oni najreprezentativniji i/ili prikladni za obnovu.

Ključne riječi: *suhozidna baština, višeprostorne ovčare, mrgari, tradicijsko ovčarstvo, cresko-lošinjsko otočje, hrvatski Jadran*