PART II – THE UMAG FIELD SURVEY AND THE WESTERN BUJŠTINA LANDSCAPE
6. THE BUJŠTINA LANDSCAPE

6.1 Istria and Bujština

The Istrian peninsula is a well-defined geographical region, surrounded by the Adriatic Sea on the west, south, and east, and a mountain range of Učka and Ćićarija on the north. This geographic setting has contributed much to the specific historical development marked by a degree of isolation from the mainland and a strong impact of unstable maritime connections. Traditionally, Istria is divided into three parts: “Red”, “Grey”, and “White” (Krebs 1907, 42). These refer to typical soil colours, and denote three distinctive geomorphological areas. The largest and most densely inhabited today is the Red Istria, stretching along the west coast on various types of “smothered red” terra rossa soils that cover a slightly tilted carbonate plate. Grey soils are ubiquitous on Eocene deposits or flysch, and cover the hilly relief of central and northern Istria. White Istria is mainly karstic, mountainous terrain which divides the peninsula from the mainland as a continuous limestone wall. The coast is hospitable on the western side, open to an undulating plain and provided with numerous bays and harbours (Roglić 1981). The eastern coast is harsh, rocky, especially deeper in the Kvarner bay where the mountain Učka plunges directly into the sea. In some places, notably the Umag area, shallow underwater reefs may pose threats for careless navigators (c.f. Kozlič 1987, 140).

The study area of western Bujština (western sub-region of Buje) is situated on the north-western corner of Istria, and is delimited by two rivers, Dragonja and Mirna, both characterised by deep river valleys with steep, limestone- and flysch-covered sides. No distinctive geographical border can be identified to the east, where Bujština slowly raises to the karstic plateau of the Buzeština sub-region. Even so, Bujština is geographically one of the better-defined Istrian sub-regions, and, consequently, shows some distinctive features in its historical development. A geographical feature that should be stressed is the position of the western tip of Istria in the maritime navigation network. The bay of Savudrija is the last vantage point for crossing the Adriatic in the direction of Aquileia or Venice, especially for the traditional navigation that tried to let the coastline out of sight as few times as possible (Brusić 1996, 1; 2009, 247). The first modern lighthouse on the eastern Adriatic was built in Savudrija in 1818 (ibid.).
6.2 Geology and relief of the Bujština subregion

Bujština comprises three geological areas: a gently sloping coastal plain covered by *terra rosa*, a karstic plateau characteristic of central and northern Bujština, and flysch-covered terrain in the eastern parts (Baldaš 2007). On the north-western tip of the Šavudrija promontory there is a small patch of wind-blown loess soil which is associated with the earliest evidence of human occupation in the Epipalaeolithic, possibly because of good preservation characteristics (Malez 1986, 21, 23). The coastal plain has a slight but perceptible tilt towards the coast, allowing for fairly good drainage, except in the area near Umag, where evidence of localised alluvial sediment accumulation is clearly visible.
The most distinctive feature of the area is the continuous coverage of deep terra rossa, especially on the Umag-Petrovija plain and in the hinterland of Savudrija. The transition to the karstic plateau of Bujština is abrupt in the area surrounding the Umag plain, giving an impression of a large basin of red soil supported by calcareous outcrops. To the north this change is less pronounced as the terra rossa-covered areas become progressively smaller and patchier. Karstic terrain that occupies much of the Bujština region can take a variety of forms, from gently undulating, covered with continuous soil cover of varying depth, to barren, inaccessible rocky terrain unsuitable for any kind of agriculture. In any case,
patchiness, poor water availability, and a varying degree of rock intrusions will always guide the agricultural practices of the area. Flysch terrain is not present in the principal part of the study area, but appears only on its eastern edge. Only further to the east typical gullied relief can be found, along with extensive terracing developed over centuries in order to preserve arable soil. It should be noted that today the “mild” flysch of the area between and around Buje, Brtonigla, and Grožnjan is considered as one of the best terroirs for vine growing in Istria (the so-called “white soils”: bijele zemlje, terre bianche), as we have been informed by local winemakers.

A formidable topographic obstacle is formed along the northern edge of the Bujština karstic plateau, where it raises sharply only to fall abruptly toward Piran Bay and the Dragonja valley. This is the fault-bounded rim of the so-called Buje anticline, an elevated limestone ridge that runs east-west from the Buzet area to Savudrija (Matičec 1994, 202). It forms a continuous mantle of steep slopes between the Dragonja valley and Bujština. The elevated, northern part of the anticline will be called the Savudija ridge here, as it does not have a specific oronym.

Figure 17 Shematic section of the Buje anticline in the north-south direction (Dragonja valley is on the left) (Matičec 1994, fig. 4).
The study area of western Bujština is predominantly karstic. Water is drained under the surface leaving the impression of an area with poor water availability. The only water courses appear intermittently in the wet season in the low laying areas. The most important is Potok, which is dry for the larger part of the year but can grow up to c. 10 m$^3$/s in the wet period (Tomić 1981, 84). A smaller and even less frequent watercourse is formed close to Savudrija as well. However, the situation with water is not as problematic as it may seem. Underground courses of fresh water appear, for instance in Santarel in Lovrečica and Finida in Ladin Gaj, where they flow out directly into the sea (Milotić 2007, 13). It should be noted that karst is a very dynamic geological system, so that the location and (dis)appearance of underground water courses may have varied considerably over time. Sources may emerge in places where

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14 There seem to be some errors regarding the data on the map. For instance, the karstic pond in the vicinity of the Sv. Lovro church (cf. infra) is represented as a water well (second dot from the north). The intermittent stream in the Savudrija area is omitted, while some lesser intermittent water courses do appear.
the karst is more developed, as a rule on contact with underlying impermeable layers, like the case of a pond with underground, natural drainage beside the medieval church of Sv. Lovro in Valfontane (Figure 19). Otherwise, typical karstic water sources can be found only further inland, in the areas with higher precipitation levels, and developed karstic geology. *Terra rossa* is characterised by good water retention because of its high clay content, which allows either natural or artificial creation of small ponds (*lokve*). *Lokve* used to regularly accompany smaller settlements, providing water for the inhabitants and their animals until well into the twentieth century. If deprived of regular maintenance, ponds soon turn to sources of disease. The appearance of malaria in the 1970s, after a period of abandonment of traditional water sources, has incited a sanitary action that resulted in the burial of numerous neglected ponds (Milotić 2007, 15).

Figure 19  Maintained karstic pond behind the medieval church of Sv. Lovro. Right: a detail of the outlet in limestone.

Sea currents are significantly weaker in the caput Adriae region than in the rest of the Adriatic, and only partially correspond to the general pattern of the counter-clockwise motion of the sea mass, to the north along the eastern and to the south along the western coast (Orlić, Vilibić et al.), (Figure 20).
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Figure 20  Sea currents in the Adriatic (Orlić, Višnjić et al.).

6.2.1 Dolinas

Geological features that have been paid special interest in the Umag survey are karstic dolinas. Surprisingly, the archaeological finds from them have been only recently reported in Croatian Istria and this evidence comes from western Bujština (Markocija golf course; see p. 169). Dolinas are mostly formed by the progressive dissolution of underlying carbonate rocks in water and typically result in the accumulation of thicker sediment deposits in the depression, allowing accumulation of usable agricultural soils in a landscape that otherwise might be completely depleted of soil. It is increasingly being appreciated that the process of soil accumulation inside the dolinas has been influenced by human activities, just as the overall landscape formation of Mediterranean karstic landscapes cannot be imagined without the millennia of human intervention (Mihevc 2005). Sediment accumulation may have started already in the Neolithic period (Višnjić 2007; Mihevc 2005, 63), but it has to be understood as a local phenomenon, related to agricultural or other exploitation of dolinas and not to large-scale erosion as sometimes assumed (see below, Ch. 6.6). Dolinas in the karstic areas of western Bujština (the Buje anticline and the western fringes of the Buje karstic plateau) are generally shallow, with mild slopes, and thus cannot be directly compared with classic karstic regions. In the first place, the overall availability of arable soil is much better in comparison with, for instance, the harsh Slovenian or Dalmatian karst, where every patch of usable soil has been cultivated and taken care of in the historic times (Mihevc 2005, 69).

15 There are also other theories, like subterranean collapse and denudation, etc. (Novaković, Simoni and Mušič 2000, 124).
Due to their specific morphology, dolinas have certain particularities that should be mentioned in order to understand their importance for human subsistence. The concave shape attracts the eroded sediment from the surrounding slopes (if the slope gradient is higher than 6%), while the porosity of the terrain facilitates the accumulation of filtered, clayey soil (Mihevc 2005). If the dolina soil has a high amount of clay, as in the case of the _terra rossa_ in the western Bujština area, water retention may arise as a major problem. This has been recorded in several places during the 2008 Umag survey, which took place in November and December. The Valkadin dolina, near the Sv. Petar hillfort, has been regularly flooded in the wet season (recently it has been turned into an artificial pond for the Crveni Vrh golf course) (Figure 21). However, many wet dolinas are sown today, usually with cultures that have the summer vegetation cycle (e.g. corn), but cereals sown in autumn can also be seen. It seems that the issue can be considered only in the context of the local climate, which changed considerably over time, as well as specific crops and their resistance to a short period of dampness. The problem of the temperature inversion, the accumulation of the cold air in winter time, is not a major issue in the mild climate, although frost is regularly seen. Perhaps the protection from wind is the more significant and beneficial feature in the winter.
6.3 Pedology and agronomic potential

*Terra rossa* soil is composed of non-soluble particles of calcareous rock and the specific, intensive colour reflects a significant amount of ferrous compounds. Recent analyses have also identified other, external constituents like flysch, as well as loess (Peh, Miko and Bukovec 2003, 203). Bauxite is quite frequent, indicating great age of the sediment (Škorić 1981, 70), and it may be said that much of *terra rossa* is palaeosol predating the Quaternary (Peh, Miko and Bukovec 2003, 203). The resistance to erosion due to its compactness is one of the factors accounting for such long-term stability of the red soil (*ibid.*). Even if heavily exploited today and considered as generally good soil for agricultural production, *terra rossa* is actually heavy, clayey, and poor in nitrogen and phosphorus. These deficiencies can easily be ameliorated with modern technology (Škorić 1981, 71), but must have had a different impact on traditional agriculture, perhaps influencing manuring practices in antiquity.

On more pronounced calcareous relief the soil is often developing directly from the carbonate substrate. This is shallow brown or dark soil on limestone and dolomite. It is of recent origin (Holocene) and not as important in modern terms due to its patchiness, shallowness, and rock intrusions, but otherwise of good structure and well saturated with alkaline compounds (Škorić 1981, 72; Peh, Miko and Bukovec 2003, 205).

The Miocene-Pliocene flysch deposits covering a large part of interior and northern Istria are very susceptible to erosion, due to the pronounced morphology of the terrain, which does not permit stable development of soil cover. Soils found in the “Grey Istria” are, therefore, typically young with a high content of the underlying rock particles and poor in organic compounds, and thus can be grouped into sirozems. Such an environment demands extensive techniques of land management, in the first place terracing, which eventually resulted in the highly pronounced anthropogenic character of local soils, even if the overall intensity of agrarian production has been comparably low. In sum, soils of the flysch region are often “immature”, and at best develop into low- to medium-quality rendzinas (Škorić 1981, 69; Peh, Miko and Bukovec 2003, 205).
Soils are one of the most important factors in the study of agrarian societies, and while we cannot enter into an in-depth assessment of the soil data, some remarks should be made prior to discussing the archaeological patterns recovered by the survey. The problem of the evaluation of the soil data in terms of subsistence strategies of past societies cannot be distinguished from the local cultural development and the intricate relationship of culture and environment, as well as natural processes occurring during or after the specific chronological framework of a study. In fact, the relationship of past societies and the soil can be discussed as a particular perspective on the history of landscape evolution (Ch. 4.2).

An issue that should be revisited is that of soil quality or suitability for specific land use, as this is often assumed to be among the determining factors for settlement of agriculturally based societies. This is often done by relying on modern soil classifications, as these are the only ones available (Gaffney and...
However, the distinctions between good or bad soils as well as the importance of certain factors such as depth, rockiness, accessibility, acidity, etc., may be inappropriate for ancient agricultural practices, economies, and worldviews (Slapšak 1995, 31). For instance, the work of P. Poupet and F. Favory on the oppidum of Ambrussum, Languedoc (France), has shown that shallow soils on rather inhospitable slopes of the oppidum hill had been cultivated, providing a staple supply from the immediate proximity of the settlement (Fiches 1989, 265-266).

To illustrate the possible implications of direct analogies we have mapped Istrian Bronze Age hillforts against the population density at the end of the nineteenth century (Figure 23). The density map certainly reflects highly complex historical development, but since the vast majority of the population was agricultural (even if living in small towns), and urbanisation still had a localised effect in the nineteenth century, we believe that it, *grosso modo*, reflects some of the agricultural trends and preferences of the time. We have chosen this approach in order to stress the demographical aspect, rather than the simple mapping on the geological or soil map. The map quite straightforwardly shows a marked discrepancy between the areas of high settlement density and prehistoric sites, particularly in western Bujština. The placement of the hillforts, as has been recognised before, prefers stony, developed relief, like the one around Rovinj (Buršić-Matijašić 2007, 563). Apparently, the distribution of hillforts cannot be understood in terms of traditional (or modern) subsistence strategies, even if finds of stone querns are quite regular on them, indicating the importance of crops (Figure 23, right).

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16 There are some rare examples of works dealing with ancient soil classifications, such as the study of F. Favory, J-F. Berger and, T. Odiot, who have attempted to translate soil classifications of Roman authors (cf. Pliny the Elder and Columella) into present-day soil classifications, and further analysed the relationship of price lists for leasing individual land plots from the B cadastre from Orange and present-day soil coverage (Favory 2004).
Another example are ancient fields on the Markocija plateau. The landscape seems completely unsuitable for agriculture: a dry limestone plateau, with an average of approximately 30 cm of dark soil cover, and a fair amount of calcareous outcrops and rocks in the soil matrix. A recent devastation of the site has afforded a good opportunity for documenting this situation (Figures 24 and 46). Unexpectedly, extensive traces of ridge and furrow marks have been identified on the site, and are visible on aerial photography too. From the aerial photo it also seems that the cultivated field has been cleared of stone, at least in its southern part. We are unable to provide a dating for this agricultural practice in Istria, which is

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17 The database has been taken from K. Buršić-Matijašić (2007) and K. Mihovilić (1995) and in the Bujština area supplemented with the sites of Barafito (Bekić *et al*. 2008), Umag (Bošec-Ferri 2006), as well as Glavica and Dajla, which were found in the Umag survey 2007-2009 (Ch 9.2.1).
in Britain generally dated to the Medieval to Early Modern period (Taylour 1974, 57). In any case, it must predate the twentieth century.

**Figure 24** Ridge and furrow marks on the Markocija plateau and an example of the soil profile.

### 6.4 Climate

The present climate of the Bujština region is classified as humid subtropical (Cfa), according to Köppen classification system, in contrast to the Mediterranean climate (Cs) in the southern part of the Istriand coast. It is characterised by mild winters and hot summers, but the extremes are significantly ameliorated by the thermal influence of the sea in the coastal area, especially in the winter, when longer periods of freezing are rare (but frost is common). The average January temperature is over 4°C, and in July around 22°C-24°C. The average rainfall is somewhat higher in western Bujština (900-1,100 mm) in comparison to the southern part of the coast (800-900 mm) (Ogrin 2005). The climatic difference can also be seen in the regular cover of the immediate coastal zone in grass and other more hydrophilic vegetation in the Umag area, something very rare in the hotter southern parts, where only characteristic, sturdy species
survive. Areas further inland have progressively higher levels of precipitation, culminating in 1,500 mm in the hilly north-eastern region, and more than 2000 mm on Učka mountain. The rainfall peak is in October-November (ibid.).

An important climatic characteristic of the eastern Adriatic is the winter bura wind (Italian bora, Slovenian burja), which is very strong in the areas under high mountain ridges, such as Trieste, the Slovenian coast, and Senj (Enc. 2005). Bura is very dry and cold, and can reach up to 200 km/h, a combination which regularly causes localised freezing of the sea surface due to the evaporation effect. Istria has a much milder bura wind and it is the barrier of the Savudrija ridge where the bura looses its strength, which also makes the Savudrija promontory one of the key points for navigation on the Eastern Adriatic.

6.5 Sea level change

The rise of the sea level is a geological process whose impact on cultural development of Istria can hardly be overestimated. Earlier estimations, based mostly on archaeological observations, varied around 1.5 m (Degrassi 1957, 80) to 2 m rise (Kozličić 1987, 135) since the Roman period. More recently, a French-Croatian team gathered around the Loron villa project has undertaken a detailed study of submerged Roman structures and some geological markers along the Istrian coast (Fouache et al. 2004). Their basic conclusion is very conservative: no more than 50-60 cm of sea level rise since the beginning of the first millennium. It can be said that these figures have been accepted by Croatian archaeologists (e.g. Starac 2010, 181) and geologists (Režek-Donev 2005). However, their results should be scrutinised more carefully before accepting such a radical change.

Figure 25 Roman quarry and submerged notch in Soline Bay according to Fouache et al. (2004, fig. 7, 178)
Fouache et al. have identified several marine notches (grooves) in the submerged coastal zone and interpreted them as signs of a period of stability in water level rise. They have also conducted a series of measurements on several submerged Roman sites along the western coast of Istria. The notches are typically found at a depth of around 50-60 cm below the present sea level, which is also the approximate depth of several submerged Roman remains. This situation has led authors to propose a figure of only 50-60 cm of sea level rise in the last two thousand years in Istria. However, the direct interpretation of obtained figures has serious methodological flaws from the archaeological point of view. As acknowledged by the authors, the notches cannot be securely dated without reference to archaeological physical remains (geologically- or paleo-climatologically based dating is not discussed). They do, however, state that “One part of archaeological markers confirm that […] the phase of stabilisation [of water level] corresponds to classical antiquity, precisely I. and II. c. AD”, but without any in-depth archaeological or geological reference or discussion. Other researchers have also identified submerged marine notches at varying depths along the coasts of Trieste and Istria, but the dating of the features could not be assessed without further research (Antonioli, Carulli et al. 2004, 273). Fouache et al. also present a series of measurements from the Roman coastal quarries, considered as dating evidence (Figure 25). It has to be noted, though, that there is no actual relation between the interfacies of ancient quarrying and the one of abrasion, or at least it is not present on the recorded sections. The stone quarry is perhaps too low for the present sea level, but it could have been set up in any time before or after the formation of the notch. The data from the observations of Roman piers and fish ponds is also not clear. The appearance of submerged Roman marine structures is in the first place a matter of the present state of preservation due to recycling, reutilisation, and, primarily, marine destruction. Based on the presented data we see no unambiguous connection between the present state of these remains and the original Roman sea level. The only example that offers a better context for deducing sea level figures in Roman times is the one that stands out significantly from the rest of measurements. In the harbour of Savudrija, on the westernmost tip of Istria, a marine notch was indentified on a Roman pier that, unfortunately, shows clear signs of minor displacement. The notch is situated 120 cm below present surface and therefore demonstrates that a prolonged period of abrasion occurred some time after the construction of the harbour. Interpretation is complicated by the fact that piers of the Savudrija harbour remained essentially unchanged from the Roman times until the nineteenth century (Brusič 1996, 8), and the upper date when (if ever) the particular Roman structure became sheltered from abrasion cannot be established.

More recent studies comprising complex isostatic rise models, tectonics, and detailed measurements on submerged Roman structures have reached a figure of 1.5-1.6 m of downward displacement of the coastline in the North Adriatic region (Antonioli, Anzidei et al. 2007). The archaeological markers used...
have also been the Roman structures in the Gulf of Trieste and along the western Istrian coast, including
the Savudrija harbour. In contrast to Fouache et al. (2004), a careful consideration of probable original
heights of the archaeological structures in relation to their function and local maritime conditions (tidal
amplitude in the first place) has been made. Figures considered as optimal heights are an estimate, relying
on an analogy with other historic and modern marine structures (idem, 2468). However, we are not
convinced by reconstructions that sometimes arbitrarily envisage an additional layer of stone (i.e. Punta
Sottile by Muggia; idem, 2471), or inferences that the foundation level of a wall in Stramare (Muggia)
had been constructed in such a manner as to be exposed to the tidal zone (idem, 2471). Based on these
reconstructions, the Roman period sea level has been estimated at approximately -1.6 m for the
submerged sites from the northeastern Adriatic. Once again, structures that have been preserved in the
original height stand out. A submerged terrace in front of the presumed Roman cistern at Savudrija Bay
lies at the depth of -1.5 m, implying a much lower sea level if intended to be dry by the origonal plan.
However, this find has been interpreted as a part of shipyard, without any further discussion or reference,
thus assuming its regular tidal submergence (idem, 2743). The southern pier at Savudrija had served as a
breakwater and its original height cannot be easily estimated (Figure 26). A similar situation to Savudrija
is present at the Verige villa on the island of Brijuni, where a terrace at a depth of -1.2 m would indicate, if
originally supposed to be dry, a sea level rise of -1.8 m according to (Antonioli, Anzidei et al. 2007,
2473).

To conclude this lengthy examination, we would suggest that the figures of Antonioli et al. seem to
be much more realistic than Fouache et al., but still somewhat conservative. Their reconstructions seem
carefully considered but cannot be more accurate than ±30 cm at best. The only data that needs no
reconstruction, the submerged terraces at Savudrija and Brijuni, lie too low for the proposed ≈1.5-1.6 m
of coastal subsiding, implying perhaps that older estimates by Šegota and Filipčič (1991) of c. 2 m rise
should not be readily dismissed (Table 2).

18 However, the passage on the Brijuni villa concludes that “for this site, a sea-level change of 1.60 m can be
estimated”, which is based on the measurements on one pier sheltering the harbor (Antonioli, Anzidei et al. 2007,
2473). On the accompanying figure (fig. 5- site 6, p. 2472), -1.80 m has been specified instead.
Figure 26 Savudija harbour (Antonioli, Anzidei et al. 2007, 2472: fig. 5- site 4).

<table>
<thead>
<tr>
<th>Years BC</th>
<th>Relative sea level (m)</th>
</tr>
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<tbody>
<tr>
<td>6000-4800 (Early Neolithic)</td>
<td>-18.8 to -13.5</td>
</tr>
<tr>
<td>4800-3500 (Middle Neolithic)</td>
<td>-13.5 to -9.0</td>
</tr>
<tr>
<td>3500-2600 (Late Neolithic)</td>
<td>-9.0 to -6.5</td>
</tr>
<tr>
<td>2600-2000 (Eneolithic)</td>
<td>-6.5 to -5.0</td>
</tr>
<tr>
<td>2000-900 (Bronze Age)</td>
<td>-5.0 to -3.1</td>
</tr>
<tr>
<td>900-100 (Iron Age)</td>
<td>-3.1 to -1.96</td>
</tr>
</tbody>
</table>

Table 2 The history of sea level rise by Šegota and Filipčić (1991, 160).

The changes in the prehistoric coastline cannot be as precisely reconstructed as in the case of the last two millennia. The rapid flooding of the North Adriatic plain was mostly finished by around 7000-6500 BP, while the sea approached Istria around 10,000 BP (Lambreck et al. 2004, 1594, Antonioli, Anzidei et al. 2007, 2469). Precise figures vary widely. Šegota and Filipčić (1991) have devised a mathematical function of sea level change based on the assessment of 27 sites, mostly with archaeological remains (Table 2). This differs completely from the model of Antonioli et al. according to whom the coastline had already by 6000 BP been no more than 2-3 m below the present level (Antonioli, Anzidei et al. 2007, 2479)! The recent find of a Late Neolithic-Eneolithic settlement (c. fourth millennium BC) with well preserved wooden structures at a depth of 2.5-3 m in the Zambratija Bay may provide some indication
Preservation of wood implies submergence already at the time of the construction. The site is not subjected to a pronounced sedimentation regime.

6.6 Paleoenvironment and landscape formation

There has been no paleo-environmental research in the study area of western Bujština so far, but pollen sequences and Holocene geomorphology have been studied in the immediate vicinity, on the Slovenian coast and in the Dragonja valley (Culiberg 1994). Climatologically, that area differs somewhat from Bujština because of the much more pronounced influence of nearby mountains, in the first place in the strong *bura* winter wind, as well as in the lithological substrate, the Slovenian coast being almost entirely flysch covered, but the major trends in the relationship between man and the physical landscape should be comparable. More general data are available in the study of H.-J. Beug, focused on the entire Istrian coast from the Rovinj area to the Gulf of Piran (Karoušková-Soper 1983, 24-25). Recently, pollen samples from Prapočė in Northern Istria have been studied, but the location is situated in the mountainous, karstic “White Istria”, where the climate, lithology, as well as cultural development differ markedly from Bujština (Andrič 2006).

Beug has identified several temporal zones of Istrian coastal vegetation. The first one corresponds to the range from the fifth millennium to the third century BC, when no definite trace of human impact has been ascertained. The coast had been occupied by a narrow strip of macchia, while the inland was covered in deciduous oak woodland. No cultivated plants have been detected by the study and the only possible sign of human impact may be a very slight rise (1%) in oriental hornbeam (*Carpinus orientalis*), burnet (*Sanguisorba minor*), and phillyrea in the last two millennia BC due to forest clearance, but this cannot be proven. Zone 2, covering the period of the last two centuries BC, approximately the first impact of the Romans in the area, showed an increase in species that indicate large-scale forest clearance: walnut (*Juglans*), chestnut (*Castanea*), and *Secale* grasses. In the first millennium AD, or zone 3, there is clear evidence of cultivation, primarily of olives and vines. Also, the increase in the evergreen sub-climax woodland plants like Phylirea and evergreen oak (*Quercus ilex*) indicates the repopulation of the cleared deciduous oak forest. In the period from the ninth to the fifteenth century the situation has remained similar, while the evidence of new clearance was observed, probably after a period of regeneration since the Roman times, as well as indicators of intensified grazing. An intensive development of juniper heath and karst wasteland has also been identified. Finally, in zone 5, corresponding to the post-medieval and recent period, the development of macchia was again visible, which in the formation of the coastal belt corresponds to the prehistoric situation (op. cit.).
More detailed data are available from recent studies in Slovenian Istria. In samples from Koper Bay, clear traces of forest clearance are visible already in the Neolithic period but pollen traces of cereals appear only in the Roman times, indicating a low share of agricultural land in the prehistoric landscape. Walnut, chestnut, olive tree (*Castanea, Juglans, Olea*), and domesticated Vitis became common only in the Roman times. Very high values of grasses (*gramineae*) in an undated period after 1000 AD are a sign of large-scale pastoral economy and are interpreted by the author as the beginning of the first large-scale deforestation (Culiberg 1994, 204). Samples from the inland area adjacent to the Dragonja valley, spanning the last five or six centuries, show a very pronounced share of pasture and subclimax woodland species, which along with scarcity of cereal pollen indicates a strong orientation toward large-scale pastoral economy (Culiberg 1994, 205).

**Figure 27** “Schematic diagram of the cross-section of the middle reach of the Dragonja valley. (A) Before Roman deforestation, (B) after Roman deforestation, (C) after large flood around 1890, (D) after abandonment of fields after WWII, (E) after increased area of mature forest around 1975, current terraces indicated with their height” (Keestra et al. 2005, 200, fig. 10).

Also available is one detailed geomorphologic study dealing with the development of the Dragonja alluvial valley, which borders the northwestern corner of our western Bušćina study area (Keestra et al. 2005). The authors have concentrated on the period after the mid-nineteenth century, providing a very
detailed study of the relationships between the formation of the river bed and sedimentation that can be linked to past land use practices (Figure 27). Unfortunately, the periods that may be of interest for our purpose were dealt with only briefly, even if the data obtained, including a range of C\textsubscript{14} dates, encompasses the entire Holocene epoch. Nevertheless, their treatment of the archaeological data should be discussed as it raises some important issues for the understanding of landscape history. Based on the assumption that “the first large-scale deforestation probably took place during Roman times”, and without consulting the above mentioned palynological studies, the authors proceed to reconstruct a massive colluvial erosion “after Roman deforestation” (Figure 27-A).\textsuperscript{19}

Therefore, the phantom of Roman deforestation and catastrophic post-Roman erosion that is constantly reappearing in the geomorphological studies, in spite of decades of critique, has to be briefly revisisted (i.e. “the younger fill”: Dyson 2003, 98; Roberts 1998, 191). Pollen samples have in many instances shown woodland clearance in the vicinity of Neolithic sites in the Slovenian Karst, as well as in Koper Bay (Culiberg 1994). Samples from Prapoč in highland Istria show that such activities probably took place by the Later Neolithic (Andrič 2006, 56). In the Bronze Age, when the first cereal pollen appears in the Prapoč sample, more conclusive evidence of woodland clearance has been observed (Andrič 2006, 57). However, in Slovenian Istria and Karst large scale deforestation with catastrophic consequences can be ascertained only since the mid-second millennium AD, that is, in the period of developed market economy and a high demand for wood (Culiberg 1994, 206). Transhumant husbandry also developed on a larger scale in the same period (ibid.).\textsuperscript{20} Finally, certain C\textsubscript{14} dates form the Dragonja valley alluvial terraces point to an event of massive alluvial deposition in the sixteenth or seventeenth century (330±25–420±50yr BP) (Keestra \textit{et al.} 2005, 201). When all this evidence is combined, a rather more complex landscape history begins to emerge. Roman impact, which must have been profound, especially in the coastal and other populated areas, still cannot be the main cause of landscape degradation in the Dragonja valley and elsewhere up until the nineteenth century. Much, if not the most of colluvial erosion in Istrian landscapes has occurred in post-medieval times, until sometime in the nineteenth century, depending on the region. As elsewhere, multiple cycles of soil stability and movement by erosion should be expected (e.g. Argolid on Peloponnesus: van Andel and Runnels 1987).

\textsuperscript{19} The argument is also “confirmed by an archaeological find, where a Roman structure was unearthed at a depth of 6 meters below surface”. However, we are not informed on the topographic position, date, function, or any detail of the structure. We have not been able to reach this information by the reference provided in the article, this being a multilingual exhibition catalogue, where even less information is available (i.e. a mention of a Roman wall found by chance in 1958; Žagar 1991, 32). \textit{Slavica non leguntur}.

\textsuperscript{20} Migratory husbandry, usually referred to as transhumance, has been practiced in Istria since the Middle Neolithic, but its impact on the regional ecology still has to be assessed (Boschian 2006, 158).
6.6.1 Recent forest clearance in the Umag area

Regarding the deforestation issue in the area surrounding Umag, the historical evidence since the post-medieval period seems to point to a very gradual process that cannot be compared to large-scale deforestations in the Slovenian Karst or other landscapes with a pronounced relief. It is also true that the flat, *terra rossa* plain is not at risk from such an activity and thus natural reforestation is quicker and more successful. As far as land use history is concerned, a very important fact is the severe under-population of the entire Istria after the medieval period, which the Venetian Republic tried to amend by systematic colonization (Slukan-Altić 2005). The natural vegetation of western Bujština today is oak and oriental hornbeam deciduous forest (*Quercus pubescens* and *Carpinus orientalis*) (Škorić 1981, 70; Kovačić et al. 2008, 14-16).

In the first half of the sixteenth century, Pietro Coppo, together with other chorographers of the period, repeatedly mentions forests on the Umag plain, usually along with remarks on the arable land covered in crops (Darovec 1999, 51, 56, 148). It is difficult to interpret these notes as they often appear to be general remarks that convey an appropriate, pastoral image which may not be an exact account of particular places. Special caution should be taken in the case of forests in particular, as Istria was a major supplier of wood in that period, but it may not have been acknowledged that the wood predominantly came from the interior of the peninsula.

However, some other information that we have come upon also seems to cohere with the image of a forested Umag plain. On the early seventeenth-century century map by Ortelius, a sketch of a forested area appears close to Umag, perhaps not purely as a decorative device judging by the position of another forest in the Dragonja area (or Kras?) (Figure 28, left). On the other hand, the only forest resource that had been well-known and exploited by that time, the Mirna valley and the mountainous area further inland, are not marked, so that the overall accuracy of the map is not reliable (Lago and Rossit 1981, T. LVI). Finally, some place names in the Umag vicinity definitely point to substantial forested areas, in the first place the Bosco Grande / Vela Boška forest, which has been reduced to a narrow strip during the last century, but at the end of the nineteenth century still covered a large space to the south of Petroviša (Figure 28, right). Degrassi also mentions the use of Sv. Ivan harbour for local wood export “several centuries ago” (Degrassi 1957, 53).
Further study on the past land use in the Umag region would take us too far from the main subject of the interpretation of field survey results. We have chosen not to concentrate on the post-medieval period anyway. Nonetheless, it is important to imagine the possibilities of radically different past landscapes. The natural cover of the area is deciduous oak and hornbeam forest, which must have played a specific role in the development of the cultural landscape. The other component of this landscape, the human impact, should be considered in relation to the suitability of the particular soil units for traditional and ancient agriculture, which has been discussed above. For instance, the calcareous Markocija plateau has been abandoned and naturally reforested in the first half of the twentieth century, while the forested areas of the terra rossa plain seem to retreat more rapidly in the recent period, parallel to the introduction of modern agricultural techniques.

6.7 Anthropic formation processes

As already discussed, landscape evolution cannot be easily divided into natural and cultural formation processes, as these are often intertwined in complex processes (see Ch. 4). Here we shall focus on several observations from the fieldwork during the Umag survey.
A large part of the Umag Field Survey was conducted on large, intensively cultivated fields in the Umag and Savudrija surroundings. Some of these were previously the property of one of Yugoslavia’s so-called PIKs (prehrabomeno-industrijski kombinat, “agricultural-industrial combine”), a public agricultural enterprise with extensive agricultural surfaces under direct ownership and oriented towards export to a wider market (Milotić 2005). The agronomical practices of the time when it operated (1960s to early 1990s) preferred deep ploughing, 60-90 cm in depth (possibly even deeper the 1960s). This technique is, unfortunately, still used today, but has somewhat declined in popularity. However, the new politics of planting olive trees in order to raise the quotas before entering to the European Union has also set off a wave of deep ploughing recently. The effect of such practices seems obvious, but in the case of the site Makale 1, discussed below (p. 185), some of the Roman structures have been recorded in situ by a radar device even after the planting of an olive grove. The activity of the Umag PIK is one of the chief reasons for the frequent reports of Roman finds in the Umag and Savudrija areas in the 1960s (cf. Matijašić 1986; Mlakar 1979).

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21 Deep ploughing is still the recommended, standard procedure before planting vine or olive. It is important for water drainage, especially for olives, which are susceptible to excess moisture (www.argokub.com/vocarstvo/pripremom-terena-do-brzog-razvoja-masline/3492/, accessed on 10. July 2010). This is exactly the problem with the clayey terra rossa soil.
We did not obtain the official records of the Umag PIK, but a certain idea of the recent landscape development can be gained from the satellite imagery. Unfortunately, such data does not exist for the period of the early 1960s or earlier, that is, before the extensive changes brought by the PIK and mechanised agriculture in general. However, the results of the first Landsat mission from August 1973 are available, the same year when the data for the 25,000 map was acquired. This provides a solid base for the coarse interpretation of the images (e.g. distinguishing forested areas, vineyards, etc.). The difference between small, traditional plots and bigger and square shapes of the new, reorganised cadastre is readily apparent in the 1992 and 2005 images (Figure 31). It has to be stressed that only a part of the newly formed fields belonged to the PIK; much of the land was tilled by PIK’s cooperates and other farmers, but the final effect is much the same. The fields in the southern zone, which, as we have been informed, were the property of the PIK, were predominantly covered in vine, and a tendency of enlarging the vineyards is evident until the early 1990s. Vineyard planting is a highly destructive agricultural activity, but its subsequent tillage is moderately disturbing and thus it may provide an acceptable environment for field survey. However, the wine business has run down in the meantime and a considerable part of the vineyards is now deserted and with low surface visibility. More recently, large monoculture land plots around Seget have been parcelled out, creating a more heterogeneous landscape, which introduced a range of new transformations (new paths, field cabins, etc.). This we infer from the comparison of the 1992 and 2005 Landsat images on which the Seget area is situated in the southern halves (Figure 31).
FIGURE 31 Landsat imagery of western Bujština. In all the images the visible red channel is substituted with the infrared. This stresses the reflection of certain types of vegetation (esp. those with higher amount of chlorophyll at the moment of image acquisition). Older images are shown in smaller scale due to coarse resolution of the earlier Landsat missions.\(^\text{22}\)

\(^\text{22}\) Scene identifiers of the used Landsat imagery are: EMP206R28_1M19730806 (6-Aug-1973), LM22050281981166AAA03 (15-Jun-1981), ETP191R28_5T19920818 (18-Aug-1992), LE71910282005210EDC00 (29-Jul-2005).
The most practical way of clearance of stone from the ploughsoil is tossing-off on isolated heaps or piling along the field boundaries, a practice that can be observed worldwide (see Ch. 4.2). Aside from displacing larger artefacts such as brick, tegulae, and amphorae, which can often be found along field boundaries, in the long term this may contribute to the creation of “false” sites. Such a situation has been identified in the Špinel 1 location, where initially an elongated concentration of small stone and very scant fragments of ceramic building material was recorded as a potential archaeological feature (Figure 32). The finds were not dated, but seemed to comprise a certain degree of Roman ware. Based on the field data solely, an interpretation was not possible (a path had been hypothesized). Analysis of aerial photography from 2004 and a topographic map from 1973, showed that field boundaries in the area have been rearranged, and that what has been identified are, in fact, the remains of an old field boundary and a path that used it. This took place before 1992 or perhaps before 1981, when the area seems to be homogeneous although the resolution of the satellite image is too poor for assessment (Figure 31).

Figure 32 The change in field boundaries in the vicinity of Špinel (aerial photograph from 2004 (DOK 1:5,000 2005, image 5A19: Umag-30), map data from 1973 (TK 1: 25,000 1997, sheet 366-1-1)).

Looking at the development of the field system in the Umag area, it becomes evident that much of the surveyed area has been rearranged radically in the past fifty years, and that the finds from any period might have been, during centuries of tillage, displaced first along the field boundaries and then spread all over again in the process of creating large agricultural surfaces. Recent changes are still visible on aerial
photography, such as the one mentioned above, but are very difficult to recognise in a systematic manner. They may contribute much to the confusion in the case of elusive types of remains such as occasional thin, unidentifiable concentrations of surface artefacts. The consequences for the distribution of off-site material are obvious. Any serious interpretation of off-site finds or “small sites” has to start from a solid overview of the development of the agricultural landscape.

Due to long-term agricultural destruction much of the variability in the surface record cannot be directly interpreted in terms of the differences in the original (or depositional) state. Sites that have been freshly destroyed have an abundant and diverse surface record, accompanied by many traces of destroyed structures like chunks of mortar and pieces of stone for construction (e.g. Makale 3, see p. 185). On Makale 1 a Roman coin was also found, a find that was spotted in only one further instance during both seasons of the survey. The rest of the sites are in a much more deteriorated state. As a rule they are comprised only of a vague scatter of fragmented building ceramics and a quantity of small amorphous stone, while pottery and other finds are scarce. Therefore, the diversity of the surface assemblage may not be a reliable factor in their characterisation, at least not without a detailed finds collection.

A good example of the recent deterioration of ploughsoil sites is provided by the site Petrovija 8, in an abandoned vineyard under the hamlet of Makale (see map on Figure 74). It was covered by the Bosco Grande forest in the late nineteenth century and turned into the vineyard in 1966 (we do not know whether it had been cultivated in the meantime). On that occasion, after deep ploughing, numerous finds from the Roman period surfaced, along with many traces of architecture. Š. Mlakar has published six stamped tegulae pieces, which indicates an extraordinary richness of the surface record (Mlakar 1979, 35-37). Also, numerous finds of amphorae, dolia, and coarse pottery were reported, as well as a piece of funerary stele, and a stone base for an olive press stipites (Matijašić 1986, 84). Upon our survey in 2007, the site has been reduced to a somewhat larger scatter of small, abraded ceramics, while the vineyard had been abandoned and vegetation obscured the visibility considerably. We were unable to gather any specific data with the applied methodology (cf. infra). In the end, the size of the scatter is the only piece of data that can be compared to other sites. Although this parameter is considerably affected by agricultural practices, it seems from our experience, as well as that from other surveys (e.g. Trément 1999, 29), that it does retain its informative value anyway. Surface concentrations cannot be expanded ad infinitum before they merge with the off-site scatter, and some rough correspondences of scatter sizes with the original surface of the discarded and abandoned artefact scatter can be expected. However, any classification relying primarily on sizes of surface scatters is not adequate.
The most advanced state of destruction was encountered in the surroundings of Špinel, where most of sites were recorded using off-site technique due to a very sparse and borderless concentration of finds. This area has been cultivated extensively since the nineteenth century (olive/vine) and was radically reorganized in the 1960s or 1970s (Figure 31). A large red spot in the centre of the Umag plain, visible in the June 1981 Landsat image, stands on the site of the slightly elevated field named Federica, where several Roman and Prehistoric sites were recorded (Figure 33). It is a consequence of high infrared radiation of vegetation in climax, perhaps indicating extensive irrigation (a similar signal is visible in several spots in the low-laying areas in the same Landsat image). In any case, it points to intensive, modernized agriculture since at least thirty years ago and probably more than forty, judging by the 1:2,500 map and the absence of vegetation in the 1973 image of this particular area.

A detail that should be mentioned in the context of the development of the Umag agrarian surroundings is the channelling of the Potok stream. An additional channel, probably partly artificial, branched off from the main course of Potok below Jeci village and continued to the south of Umag. It is visible on the nineteenth-century map and has been active until the 1970s or 1980s, judging by the satellite imagery and recent maps. We are unable to date its construction, but it might be an important indicator of the early intensification of agriculture in the area. The periphery of the Špinel 11 Roman site was also disturbed by the construction of the channel (unless it is of Roman date), as well as with its refilling and ploughing-in (Figure 33).
Curious finds that are probably related to a technique of land management have been recorded in a swale under Makale, and besides the Potok stream in the Špinel area. Both are comprised mostly of post-medieval and modern pottery pieces, construction ceramics, and occasional Roman finds. In both cases, the presence of murex shells (*Hexaplex trunculus*) was noted, which was not observed as characteristic of other field scatters. The distribution of these finds could not be delimited, even by the counting technique, as the finds concentration was very low and did not have the usual central part with the highest density. We are not able to interpret these finds with certainty. Planned deposition of soil in wet areas is a possible explanation.

On the hillfort sites the history of use and reuse is of different character and even more complicated. Sv. Petar has been cultivated on both lower and upper terraces. Markovac II had a peculiar reconstruction in the nineteenth century, which is both scenic (*a belvedere*) and agricultural, providing a terraced space with excellent, dark soil. Most of the surveyed prehistoric sites on higher positions have some traces of
military trenching form either the First or Second World War. A phenomenon that may introduce some confusion is the reuse of the structures for herding, which can date from any time since the construction of the hillforts. Some sites may have been constructed for pastoral requirements originally, so the distinction between the post-abandonment and settled phases, which do not differ much, can be very tricky. Very frequently simple circular or rectangular structures were observed on stone cairns of prehistoric date. We have interpreted these as shepherds’ shelters, but in some cases military lookouts may also be a possible explanation (Figure 34). Hillforts will be dealt with in detail and accounts of post-abandonment histories will be presented individually, because each site has very specific reuse histories.

**Figure 34** A simple shelter on the Glavica cairn, Markocija plateau; possible military lookout.
7. FIELD SURVEY METHODOLOGY

The field survey of the Umag region was preceded by a study of the literature and a number of visits to different parts of the landscape, as well as to already known sites. This has enabled us to define appropriate areas for systematic surveying and other methods. The most restraining factor in the artefact-based systematic survey has proven to be the vegetation cover and agricultural practices, as could have been expected. Therefore, areas under spatially continuous, intensive cultivation have been chosen – the Savudrija area and the Umag plain – both covered by an extensive layer of *terra rossa*.

The first season, from January to March 2007, started in the Savudrija hinterland, which served as a test ground for the development of the appropriate methodology (see overview map on Figure 35). The first month the team had only two members and the main goal was to get acquainted with the surface conditions, field equipment, and local archaeology. On the hillforts Glavica in Markocija and Markovac II, the first experiments with recording hillfort sites were made. Later on, the team was enlarged to four or five and the activity was transferred to the Umag plain, the most promising zone in terms of Roman sites. The systematic survey in the next season, November-December 2008, was organised in the Špinel sector and extended to fill in some gaps of the previous season in the Vilanija sector. The difference in methodology is discussed below. Parallel to the field survey, the work on recording hillforts and prehistoric necropole sites was continued, also with significant technical improvements. In the same period, the late Roman fortress on Sipar promontory was surveyed in detail, on occasions when weather conditions were favourable. Due to financial and other problems, the third season of the field survey was reduced to the topographic recording of hillforts Markovac I and Kaštelir with a team of two or three. Thus, the Umag survey was organised rather heterogeneously from the outset, deploying systematic fieldwalking as the primary, but not the exclusive approach.

The methodology of the field survey had not been devised precisely in advance, but rather developed in the course of fieldwork, seeking the balance between the potential offered by the surface record, the economy of the project organisation, and finally, theoretical and methodological implications. Unlike the Beotia survey, which started out too optimistically, applying what turned out to be an overly detailed field technique (Bintliff 1985, 201), we have started with a very coarse and simple procedure that has been refined significantly afterwards. It should be stressed that the Umag survey was a museum project, in contrast to the university or institute background of the vast majority of systematic surveys, which
accounts for a different, lighter theoretical load, and a flexible, less mechanical approach to field techniques.

Numerically, in the survey campaigns from 2007 to 2009, a total of 526 tracts were surveyed, covering 521 ha. The average size of a tract is thus around one hectare. For the purpose of further analyses, the surveyed tracts are considered as approximately a 25% sample of the several continuous blocks of the terrain (1,600 ha). These blocks (Savudrija hinterland, Umag hinterland, and small samples near Materada and Sv. Ivan) will be regarded as the surveyed area in the further discussion (Figure 34). The coverage of the extensive, unsystematic survey cannot be quantified in this manner.

Considering both the methodological and the practical problems regarding site definition, it is not possible to present the exact count of surveyed sites. This is particularly noticeable for the 2008 survey, when the methodology applied was close to the siteless approach. For the purpose of the official report to the Ministry of Culture we presented 26 sites, since a continuous raster of off-site finds is not recognised by the current regulations. However, only 18 sites will be published in Hrvatski arheološki godišnjak (in print), together with an illustration of off-site distributions in the Špinel area. A related problem is insufficient data on many find locations which are rather arbitrarily designated as potential or probable archaeological sites. The database that will be considered in this work is comprised only of already published sites. This data (55 sites) is presented in the Croatian-language catalogue in the Appendix. Because the finds analysis has not yet been conducted, the catalogue is incomplete and, therefore, has not been translated. We have also found many sites during our work in the Umag Municipal Museum and in the informal reconnaissance of the terrain. A couple of these sites that will be mentioned in this thesis are listed at the end of the Appendix.

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23 The catalogue is regularly published in Hrvatski arheološki godišnjak. At the moment of writing this text only the season 2007 was available. The 2008 and 2009 seasons were in print. It should be acknowledged that the first publication of archaeological field research made in Croatia should be done in this country, according to present regulations (NN 102/10: Pravilnik o arheološkim istraživanjima), and hence an in depth catalogue cannot be presented here.
7. FIELD SURVEY METHODOLOGY

7.1 Systematic survey

The pilot study in the Savudrija area was devised as an assessment of possible field recording procedures, the reliability of GPS technology, and, most importantly, of the potential of the surface data. Fieldwalking was not organized in transects but was rather non-systematic, covering the edges of smaller fields and crossing larger ones in a random manner. Site recording was also less formal, and it was primarily aimed at delimiting areas of higher artefact densities. During the course of the work a method of counting artefacts in a one-minute walk was also tested as a solution for a quick documentation of both site and off-site artefacts.
The most of systematic fieldwalking was carried out on the Umag plain, around the villages of Seget, Petrovija, and Vilanjija. The area had been previously known for Roman finds and several larger sites interpreted as probable remains of villae rusticae were identified in the 1960s (Matijašić 1986). Most of the plain is intensively agriculturally exploited, rendering it a typical setting for a systematic survey. In the 2007 season the recording was based on topographically defined tracts (units), usually single fields. For each tract several basic parameters were recorded: vegetation, agricultural tillage, visibility (in ratio), and overall off-site finds density. Other information such as the type of field boundary or composition and distribution of off-site material were noted sporadically, if observed. The distance between transects was not fixed but varied around 15-25 m, or 10-15 m in olive groves and vineyards. Off-site material was counted in a line crossed in one minute on two or more places chosen randomly inside the tract. The average or typical value was always recorded together with maximum count for those tracts that contained discernible differences in surface distributions. Off-site finds were not dated during the course of the work, and only diagnostic or better-preserved pieces were collected in the manner of a “grab sample”.

The choice of survey tracts was mostly guided by vegetation cover encountered during fieldwork; no desktop sampling has influenced field strategy other than the choice of overall study area. Not all available fields were covered, though. Areas that are generally poor in surface material, such as the Rožac and Stancija Ambrozi quarters, were surveyed in more sparsely distributed tracts. Patchily cultivated terrain was also avoided. The survey has rather concentrated on the more promising areas, eventually covering the elongated area crossing the Petrovija village.

The next survey season brought several improvements. First of all, it was decided to change the strategy to covering as many tracts as possible in a well-defined area, in order to obtain as large a coverage as possible in the given vegetation and other field conditions. Also, some filling-in of blank spaces from the previous season was planned. Survey intensity was enhanced. Transect size was fixed at 15 m, and finds from each walked line were separately recorded, along with a coarse dating. This technique replaced the one-minute counts used previously. Such an approach, essentially siteless (e.g. Caraher, Nakassis and Pettegrew 2006), has proven to be extremely helpful in the Špinel sector, where the rate of destruction has almost completely obscured (smeared) the more dense pottery scatters. As in the 2007 season, the only grab sample has been collected from both site and off-site assemblages. The documentation was also slightly improved. Three types of context were recorded: field units (tracts),

24 The following chronotypes (sensu Caraher, Nakassis and Pettegrew 2006, 9) were recorded: prehistoric (grog- or lithic-tempered, if observable), Roman (standard pottery, amphorae), medieval (coarse lithic-tempered, porous), post-medieval (standard/coarse, glazed), construction ceramic (Roman, post-medieval, undetermined).
manmade features, and sites. This has allowed for a more natural approach to finds and features that could not have been recorded as parts of specific archaeological sites.

An unexpected improvement in the 2008 season was due to the changing the fieldwork season to winter. In fact, we believe that the differences in the results of the 2007 and 2008 Umag campaigns can to a certain degree be explained by the significantly different surface conditions. During the winter of 2008 the weather was quite dull and wet, while most of the agricultural work had previously been finished, leaving, thus, time for the soil to soak and decompose. Fields were largely sown but the seed had not sprouted yet, providing a fine, smooth surface for fieldwalking, albeit very muddy. Lumps of soil were thoroughly broken down and soon after washed by the rain, which helped in revealing tiny artefacts to the prospector. The 2007 spring season had been far more pleasant, but at the same time the results were considerably poorer, as most of the fields were freshly ploughed and the bright sunlight cast sharp shadows on deep furrows. The absence of moisture also reduced the contrast of pottery sherds on smothered, deep red *terra rossa*. To sum up, the impact of surface conditions in the ploughsoil is of great importance in terms of both visibility and the composition of surface artefact assemblage.

<table>
<thead>
<tr>
<th>Survey campaign</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveyed tracts (ha)</td>
<td>223</td>
<td>106</td>
</tr>
<tr>
<td>Roman sites</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>- density (sites / ha)</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>Prehistoric sites</td>
<td>2 + 1 possible ( (\text{conservative estimate}) )</td>
<td>4</td>
</tr>
<tr>
<td>- density</td>
<td>0.009-0.013</td>
<td>0.038</td>
</tr>
</tbody>
</table>

*Table 3 Site densities in the Umag *terra rossa* plain (Seget, Petrovija, Vilanija and Špinel areas).*

The improvement of the methodology is likely to contribute to better site recovery. This is often expressed in terms of recorded site density (Ch. 5.3.2). Such an approach is not ideal because of multiple problems with survey methodology discussed at length in the theoretical part, particularly the definition of site. A specific problem of the Umag survey is the ambiguity of the data from the 2008 season. As
already mentioned, the number of sites from this season varies according to the criteria for defining a site. In order to have a comparable dataset we have chosen to use the “conservative” database, with fewer sites, as presented in the Appendix. The other problem are the spatial variations of the archaeological record. This can be overcome only in the case of a resurvey of the same terrain. In order to minimise this effect we have included in this analysis only the large surveyed area in the Umag terra rossa belt, which is rather homogeneous in geological and pedological cover (the areas between Seget, Vilanija, and Špinel). Multi-period sites (Prehistoric and Roman) are counted as Roman because the earlier phases were usually defined only in the intensive, site-based approach. This biased sampling effect has been discussed in the theoretical part (Ch. 5.3.2). Overall, in the 2007 season 0.081 sites per hectare were found, whereas in 2008 the figure raised to 0.132 sites per hectare. However, it is much more interesting to see what happens when the sites are sorted according to period (Table 3). The difference is much greater for the prehistoric period (c. 300% greater density in the 2008 season) than for the Roman period (30% greater density). Due to the spatial inhomogeneity of the archaeological record we cannot assess precisely to what extent the variation in site density of the Roman period from the two survey campaigns is a product of survey methodology. Namely, the 2007 campaign covered several large areas with a low density of Roman finds (see Ch. 10.5.1), while the 2008 campaign seems to have hit an area of considerably high site density. Therefore, we estimate that the error produced by the survey methodology amounts to less than 30%, perhaps somewhere in the range of 15%-25%. The prehistoric period, on the other hand, seems to be severely underrepresented in the 2007 survey, even when compared to the “conservative” database for the 2008 season. Here the problem may also lie in the unusual density of prehistoric finds in the vicinity of the Kaštelir hillfort (cf. infra), surveyed in 2008. The small number of discovered sites also does not permit any direct quantitative comparison, as differences may be considerably influenced by random processes. Nevertheless, such a marked discrepancy should be suspected to be an outcome of different field methodologies, especially when considering that already in the 2007 season it had become clear that the applied methodology was too coarse for the recovery of other periods than the Roman and post-medieval.

In sum, the quantitative data of survey recovery success cannot be taken at face value, but they do seem to convey a trend which could have been expected. The Roman period seems far less demanding than the prehistoric one in terms of survey intensity, since the sites are normally much bigger and more conspicuous. Probably other factors, such as the experience of the field team and surface conditions at the time of the fieldwork, have a more marked effect than the intensity alone. However, regarding the prehistoric period, it is obvious that only intensive survey is able to produce any reliable results. The sites are very small, often comprised of a handful of surface finds and in several cases were recorded using the
off-site approach (see Ch. 9.2.3). It still remains to be seen whether further intensification of the methodology would bring a significant improvement in recovery success, considering the very poor survival of the surface assemblage in the context of centuries of intensive agrarian use of the study area.

![Figure 36 Total pottery count, 2008 season](chart.png)

A somewhat different problem appears when dealing with medieval finds (seventh- to fifteenth-century). Remarkably few sites were recorded, in spite of the well-attested prosperity of the Umag commune already in the early Middle Ages (Benedetti 1973, 53ss, Bolšec-Ferri 2006), as well as of other smaller settlements in its immediate vicinity, such as Materada (Benedetti 1973, 60; Bistrović 2005), Petrovija (Matijašić 2005), Sv. Ivan and Lovrečica (Mustač 2005), and probably Vilanija (Bradanović 2005). Thus, it seems unlikely that the surveyed area was deserted in the medieval period; most probably the medieval landscape has been missed by our methodology. Furthermore, the complexity of field systems readily apparent on the topographic maps and aerial imagery certainly reflects a long period of agricultural exploitation (Figure 37). Although a study of the development of local field systems has not been made so far, it can be safely inferred that insular or radiating patterns predate the orthogonal scheme, which in its turn was probably laid out after the early seventeenth century, when the area was re-colonised by the Venetian administration (Matijašić 2005).
Figure 37 Major features of field systems in the Umag hinterland. Supposed medieval field systems are denoted by dashed circles.

Two related reasons can be considered as the cause of this strange situation. Apparently the medieval period is not characterised by extensive off-site artefact discard and the settlement was probably concentrated in villages that are still populated today. However, the pottery production from this period is also difficult to distinguish from Roman or post-medieval coarse ware, especially when considering that only a handful of fragments were encountered by each surveyor in the entire course of the survey (Figure 36). Most likely a certain number of medieval pottery fragments were misclassified during the fieldwork and the overall scarcity of the dataset only aggravated the problem. In any case, the missed medieval landscape clearly shows that the Umag survey has a serious problem with periods that are poorly represented in the surface assemblage. This problem is, in fact, not unusual: surveys frequently face problems with periods that are poorly visible in the surface material (Sbonias 1999, 4).
7.2 Feature survey

As with systematic fieldwalking, feature survey (or topographic survey) has also been improved and modified in the course of work. This survey was exclusively applied to prehistoric hillfort sites, which had been specified as one of the principal study themes. Most of the work was done by a handheld “recreational” GPS device, with the exception of the site of Sv. Petar, which was also surveyed by level instrument and tape in 2008. The precision of a single GPS unit is rather low (Figure 38), and it cannot be used for detailed plans. It is, however, good enough for very coarse features like hillfort ramparts and tumuli, considering that the result is a “sketch” rather than a precise plan that can be used for other purposes, such as recording the position of excavation trenches. Smaller details like drystone structures or hillfort entrances were measured by tape and fitted into the GPS survey. Because of the inconsistency of GPS readings it has proven essential to make a detailed field sketch supplied with all relevant tape measures, and also to do repeated surveys on several occasions.

![Figure 38](image)

*Figure 38* “This illustration shows the variation of the recorded position of a fixed point over a 24-hour period. The grid is a 10 m grid (The root mean square error was 5.7 m)” (Map Maker 2007, 214).

The traditional level-and-tape technique is based on reading horizontal angle and distance, which are afterwards corrected for height differences between the instrument and the points surveyed. In this manner a chain of reference points was established to be used for further measurements of archaeological features. The level is not well suited for the job, as its primary purpose is reading heights and not vertical angles. The precision of readings was not assessed in detail, but was certainly better than with a single GPS unit. However, at the end of very segmented polygons (e.g. 15-20 points), deviations of more than a
metre appeared, depending strongly on skill of the surveyor. The readings where transferred into GIS by a very useful feature of the Map Maker programme (Map Maker 2007, 234). This technique is not applicable on the rest of the hillfort, which are are either under dense vegetation or with more complex relief. Furthermore, level measurements are time-consuming and perhaps are not a good alternative even to a recreational GPS unit if a balance between the economy and detail is sought for. In any case, future work should envisage the deployment of more appropriate technologies, since a much higher complexity of surface features was found than envisaged prior to the fieldwork. Higher-grade GPS units with overall precision of a meter or so should be adequate.

Figure 39 Markovac I hillfort. The number of ramparts progressively increases with the intensity of survey: a) Marchesetti 1903, T IX/3; b) Umag Field Survey, 2007 season; c) Umag Field Survey, 2009 season).

The improvement of the field method in the case of feature survey from the 2007 to the 2008 and 2009 seasons was not technical, although we experimented with manual technique on Sv. Petar in 2008, but rather in the approach towards the complexity of the sites. In the first season the basic idea was to develop a method that was at the same time simple, fast, and efficient in consistently recording the major features of the sites. The results obtained were rather coarse, basically depicting the course of the hillfort ramparts along with a few details on entrances, cairns, and similar larger structures. The level of the detail thus obtained allows only smaller scale mapping (c. 1:2,500 at best), which is consistent with the level 2 of survey according to guidelines of the English Heritage, that is, an approach intended for the research of distinct landscape areas rather than individual sites (EH 2007, 7). It soon became evident that hillfort sites are far more complex than previously thought. It is revealing to compare the plan of Markovac I made on in one brief visit in January 2007 with the result from the next season that took approximately five working days (Figure 39). Therefore in 2008 and 2009 we embarked on intensive, detailed feature survey that sometimes also included clearance of vegetation. The amount of detail enabled the printing of 1:1,000 or larger plans, and intricacies of complex site biographies started to emerge (level 3 survey according to English Heritage guidelines; EH 2007, 16). However, it has also become apparent that it is an illusion to believe that by using a certain level of survey intensity it would be possible to record all the
7. FIELD SURVEY METHODOLOGY

major features of a site. The more time spent on a hillfort, the more details will emerge, not to mention problems with vegetation that obstructs visibility on most of the surveyed sites and which should be cleared if a comprehensive plan is to be produced. We have to be content with the fact that our survey is just as much the reflection of the time and effort spent on the recording as of the “real” characteristics of the sites.

7.3 Site recording

During the course of the survey several approaches to recording larger artefact scatters were tested. In the 2008 season, a 10 x 10 m grid was set up at the foothill of Sv. Petar, in what is today a cultivated area, and all the finds collected. The work was rewarding, as it procured a thorough, unbiased sample of finds, but also very time-consuming, since the survey was slow and thorough, and was finally evaluated as uneconomic in terms of a systematic application on all ploughsoil scatters. The same technique in a 5 x 5 m grid was attempted on the Sipar promontory, but was abandoned after some time (see Ch. 11). On Sipar a scale had been used in the field in order to quantify ceramic building material without collection.

Figure 40  Systematic recording of ploughsoil sites. Left: counting at chosen spots (Borozija 2, finds per minute), right: systematic counting in parallel transects (Makale 3, finds per minute, arrows indicate transects). Note the difference in vegetation on and off Makale3 site.

Ploughsoil scatters from the systematic field survey were recorded by a one-minute counting technique in a tight array of 5-2.5 m spaced lines. The position of the lines (transects) was recorded by a handheld GPS device. Only a grab sample of the entire scatter was collected, because usually no more
than a couple of diagnostic pieces along with a few fragments of typical fabrics were judged worth taking to museum depot. The problem arose when sites with obvious multiple phases were encountered in the 2008 season, and the technique was refined with multiple counts of characteristic fabrics and other chronotypes.

The choice of on-site collection and recording practice was in the first place determined by the organisational factor, i.e. the amount of time and funds available, as well as by some expectations based on previous experience. The typical field scatters on the Umag plain were mostly of Roman date and did not seem to offer a particularly varied assemblage of pottery fabrics readily visible on the surface. Only a few *terra sigillata* fragments and two Roman coins were found in both seasons, while the rest of the finds were mostly coarse pottery fragments and larger quantities of ceramic building material. Closer inspection has revealed, however, that smaller fragments of finer pottery can be found. Even so, the retrieval of such material would demand time-consuming techniques which were considered inappropriate for the primary goal of the initial seasons of the project oriented toward wider spatial coverage. A very important factor for the choice of the collecting technique was the availability of funds and expertise for find processing. In the future, collaboration with a Roman pottery specialist will have to be provided for.

### 7.4 Radar survey

A pilot survey by the ground-penetrating radar (GPR) method was done in February 2009 on the sites Makale 1, Makale 2, Seget, Sipar, and Tornina (Skelac 2009). All the sites are dated to the Roman period, while Sipar also has significant remains from the Late Roman and medieval phases. The aim of the research was to evaluate the potential of the terrain for geophysical measurements, as well as the rate of subsurface destruction of the remains by cultivation practices. The surfaces covered c. 30 x 20 m on average, which was enough to provide a reliable coverage for the identification of buried structures, but was insufficient for a full scan of individual sites (some of the results are presented below, Ch. 10.4). Overall, the GPR has proven to be very useful because of the favourable properties the *terra rossa* soil in which the surveyed sites are preserved. The clayey soil is rich in metallic compounds and fairly conductible, providing a good contrast to limestone masonry and larger concentrations of ceramic building material.
8. PREHISTORY UP TO THE ENEOLITHIC

The earliest evidence of human settlement recovered so far in the Bujština region dates to the Epipalaeolithic. The open-air site on the northern side of the Savudrija promontory has been preserved in loess deposits. Lithic artefacts, cores, and debitage attributed to the microlith tradition were found and the site radiocarbon-dated to 11,155±209 (Malez 1986, 23). About a dozen lithic artefacts were found close to Buje, in the area of Valenari, and generally attributed to the Mesolithic (Komšo 2008, 70-71). Neolithic finds are very poorly represented, the only possible traces being the two polished axes (unless they date from subsequent periods) published by Marchesetti (1903, T. XI). Their provenance from Novigrad probably refers to a wider area. A small polished axe, along with other flint implements and Bronze Age pottery, have been reported at the Sv. Pelegrin hillfort in the proximity of Buje (Ugussi, Limoncin-Toth and Morato-Ugussi 2000, 13). The Late Neolithic and Eneolithic are known from the Cingarella cave, situated in northern Bujština, above the Dragonja valley (Baćić 1956). Recently, an underwater team from the Pula Archaeological Museum made an important discovery in the north of Zambratija Bay, 5 km north of Umag, where a well-preserved submerged Late Neolithic-Eneolithic settlement has been found. The 60 cm thick archaeological layer lay at the depth of 2.5 m, containing well-preserved wooden posts and planks. The preliminary dating proposed is to the fourth millennium BC (radiocarbon dates are not available at the moment) (Koncani-Uhač 2009, 265-266).

The oldest archaeological sites discovered in field survey campaigns are the coastal site near Zambratija and the cave near Markovac. On the beach of Zambratija a few pieces of prehistoric pottery and chert implements were found, together with some fragments of Roman pottery. As the coast has been almost entirely built up, it is not possible to relate the finds to an area of preserved cultural sediments. However, an underwater Neo-Eneolithic site is located just in front of the beach so it is quite likely that finds have either been washed out or belong to a dryland extension of the submerged site (Koncani-Uhač 2009), (Figure 41). Even though the pottery is heavily abraded, it seems that on one piece a trace of “combed” decoration can be identified, which is in Istria typical for the transitional period from the Eneolithic to the Bronze Age (metličasta keramika, ceramica a striature) (Gnirs 1925, 18, fig. 7; Čović 1983, 120). Looking at aerial photography of the Zambratija Bay, we are tempted to see an unusual terramare type settlement, sheltered in a tiny, completely closed cove 250 m in diameter. The supposed man-made, submerged embankment (number 3 on Figure 41), was excavated by the Pula Museum team, but without any conclusive result (Koncani-Uhač 2009, 265).
Figure 41 Prehistoric sites in the Zambratija Bay: 1: Findspot on the beach, 2: Eneolithic settlement, 3: possible artificial embankment (2 and 3 according to Koncani-Uhač 2009).

Figure 42 Finds from Zambratija Bay (upper left: silex implements; upper right: bone; lower left: Roman pottery; lower middle: organic- and grog-tempered prehistoric pottery; lower right: prehistoric limestone-tempered pottery).

In the Markovac cave, located in the immediate vicinity of a tumulus on the Markovac III site (see map on Figure 64), a few fragments of prehistoric pottery were identified, one bearing a decoration of parallel horizontal grooves that can be found on Eneolithic pottery in the Adriatic zone (e.g. Guvnine, Herzegovina: Marjanović 2000, T. I: 1, 2, 3). The cave was also recorded by Marchesetti, who made several test pits. Layers of ash 1-1.5 m thick were discovered, containing prehistoric pottery fragments.
D. Komšo and M. Čuka also visited the cave and reported “prehistoric pottery fragments” (Komšo and Čuka 2009, 335). The Markovac cave has all the features of a prospective archaeological site: it is dry, rather spacious (150–200 m$^2$ of reasonably flat terrain), protected from the northern wind, and positioned in a typical karstic depression which facilitated sediment accumulation.

In the course of the fieldwalking survey, few pieces of possibly prehistorically shaped silex have also been gathered, but without any connection with a particular site or a distinctive prehistoric off-site scatter. These finds might as well be a part of post-medieval off-site finds, used for instance as firestones. The silex could have been brought from any prehistoric site in the vicinity, for instance the Epipalaeolithic site of Savudrija (Malez 1986).

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25 A small square trench is visible in the cave interior today, probably the trace of some unknown excavation.
9. **BRONZE AND IRON AGE**

9.1 Study history

As in the rest of Istria, the number of known archaeological sites in the Bujština region raises sharply with the Bronze Age, when characteristic hillfort settlements appear in large numbers. Apart from small-scale rescue excavation of the entirely devastated hillfort on Crveni Vrh (Bekić et al. 2008, 244), there has been no significant archaeological research of the period in the study area. The overall dating of Crveni Vrh finds is in the Middle Bronze Age, but a detailed study has not yet been made. Recently, the material from the nineteenth-century research at Kaštelir near Nova Vas (Brtonigla) has been published and typologically sorted in a continuous range from the Middle Bronze Age to the Roman period. The majority of finds can be dated to the Late Bronze-Early Iron Age and in the Late Republican-Early Empire periods (Sakara-Sučević 2004, 104). Chance finds from the coastal site of Sv. Ivan have been published by Lonza (1977, T. 2: 4, 7, 10; T. 3: 2, 3, 5, 7, 10, 11; T. 4: 9, 10, 12, 13). The bulk of the finds has been dated to the Middle Bronze Age while several extend the dating range up to the Early Iron Age as well (ninth to eight century BC) (Guštin and Sakara-Sučević 2003). Finds from the last two millennia BC have also appeared in the rescue excavations in the medieval Umag, but have not yet been studied (Bolšec-Ferri 2006; Čučković 2009).

A unique find in the wider context is the wooden sewn boat, recovered by the Pula Archaeological Museum’s underwater team in the Zambratija Bay in 2008. The boat has been dated to 800-540 CalBC, and is the oldest remain of a boat found in the Croatian Adriatic so far (Koncani-Uhač 2009, 267).

Carlo Marchesetti, who passionately studied the Istrian hillforts (i castellieri) at the end of the nineteenth century, was also active in the area and published some important sites (Kolumbanija, Markovac I and II). However, Lonza is suspicious of his data, as Marchesetti is known to have relied on local informants for part of his work (Lonza 1977, 25). This can indeed be deduced from the varying detail of description in Marchesetti’s work, but his impressive and highly informative work should not be dismissed. A closer inspection of sections dealing with our study area reveals a great difference in the details provided on the sites of Markovac – where a small test excavation was made in a nearby cave – Kolumbanija, and Kaštel near Buje (Marchesetti 1903, 76-78), in contrast to Kaštelir, Romanija, or even the big hillfort of Sv. Petar (idem 92). The pattern actually follows the major road(s) connecting Piran and Koper with Poreč and the rest of Istria, as well as the first Istrian railway finished by 1902. Perhaps
Marchesetti was also attracted to this particular area for the purposes of his botanical research. Although we too have found inconsistencies in Marchesetti’s work, for instance the omission of the fairly visible multiple ramparts on the Markovac I hillfort, his work is still quite accurate and extremely useful, especially in cases of subsequent damage or destruction (Karouškova-Soper 1983, 2).

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Table 4 Schematic chronological framework of the Istrian *castellieri* period.
9.1.1 Topographic and spatial studies

The number and diversity of finds from the later prehistory recorded in the Umag survey campaigns has enabled more elaborate reflexions than, for instance, a handful of finds from earlier periods, so that some features of the wider research context should be briefly revisited. We shall concentrate primarily on some aspects of topographical and spatial studies that have directly influenced the design of the Umag survey. Comprehensive histories of research can also be found in Novaković (2001, 191-197) and Buršić-Matijašić (2007, 69-88).

The seminal and by far the most influential work on the archaeological topography of Istria is certainly *I castellieri preistorici*... by Carlo Marchesetti, a naturalist and long-standing director of the Museo civico di storia naturale di Trieste (The Museum of Natural History of Trieste), published in 1903 after decades of fieldwork. He surveyed and sketched a vast number of Bronze-Iron Age hillforts and his data still forms the backbone of the archaeology of these periods in Istria. Marchesetti also offered the first historical interpretation of the Bronze-Iron Age period that is, roughly, still acceptable (Novaković 2005; Čović 1983, 114-115). His caution in explaining spatial patterns should be stressed, for example in the case of the low concentration of hillforts in the western Bujština region, which he considers as a feature of local topography rather than a meaningful cultural pattern (Marchesetti 1903, 92-93).

Marchesetti’s tradition has been continued by Klara Buršić-Matijašić, who has recently published an exhaustive catalogue of Istrian prehistoric hillforts based largely on the work of Marchesetti and an unpublished catalogue of Boris Bačić, a former curator and director of the Pula Archaeological Museum who researched widely in the period from the late 1940s until the 1970s (Buršić-Matijašić 2007). Bekić published 85 prehistoric sites from the Rovinj area, mostly hillforts and some hilltop tumuli. He should be credited for attempting the first systematic topographic sketching of the hillforts after Marchesetti in the Croatian Istria (Bekić 1996).

The introduction of the modern spatial approach can be seen in the studies of Věnceslava Karoušková-Soper and Božidar Slapšak, both made in the late 1970s but published in 1983 and 1995, respectively. Both apply site catchment analysis extensively and consider economic and/or political territories around the hillforts (Karoušková-Soper 1983; Slapšak 1995). This tradition has been continued by P. Novaković in the 1990s, who applied a wider range of spatial analytical methods in order to assess the relationship with the environment and, ultimately, the demographic implications of proposed models (Novaković, Prostorska in pokrajinska arheologija: študija na primeru Krasa 2001). S. Poglajen has recently demonstrated the possibilities offered by the geostatistical approach (GIS) (Poglajen 2007). A brief spatial analysis has also been made by Hänsel *et al.* in their discussion on the social differentiation
of the Bronze Age society in the Rovinj area. They applied a hierarchical, territorial model similar to works already cited above (Hänsel et al. 2009).

These works line up into an established tradition which may be referred to as “hillfort studies”. This thematic is certainly not uniquely popular in the Istrian context. For example, a systematic and well-coordinated project of hillfort topography and trial excavation was undertaken in the 1970s by the Centre for Balcanological Researches under the direction of A. Benac in southwestern Bosnia and Herzegovina, which also included an early example of visibility analysis (Benac 1985, karta 5). Quite similar is the long-term project on late prehistoric settlement of southeastern Slovenia led by J. Dular and the team of the Ljubljana Institute of Archaeology, but with a far more advanced analytical approach (Dular and Tecco-Hvala 2007). Istria, unfortunately, has never witnessed a systematic project on a comparable scale. Finally, for a recent “hillfort study” with more contextual and social affinities we may point to an article on the hillforts of southeast England by S. Hamilton and J. Manley. Their criticism of “clichéd descriptions” and “dominating presumptions” has influenced this thesis to a certain degree, as well as their socially oriented models (Hamilton and Manley 2001).

Several assumptions on the hillforts and their social context can be sorted out as common in works dealing with Istrian prehistory:

1) The hillfort paradigm. Fortified hilltop sites are the most prominent settlement type, or at least the representative one for the study of the spatial aspect of past cultures on a regional scale. Permanent settlement is usually supposed cautiously, or at least selectively, on types with better settlement potential (e.g. Slapšak 1995, 58). However, in the absence of data from other types of sites, in most cases only analyses assuming permanent settlement can be deployed (e.g. site catchement, Thiessen polygons, etc.). The GIS seems to fit ideally in this niche (e.g. Gaffney and Stančič 1991). The direct consequence of 1) is:

2) The hillfort paradox. Until recently, small, open-air sites from Bronze-Iron Age Istria have been almost unknown, and virtually absent from Croatian literature, because of the exclusive focusing of research on large sites (hillforts and necropoles). It is a paradox that more Neolithic than Bronze-Iron Age open-air sites were known only five or six years ago.

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26 A similar critique of idées fixes was also formulated by J. Chapman with regard to the prehistoric archaeology of Dalmatia. He presented these assumptions as stereotypes (e.g. mobile Copper Age cultures, nucleated, hillfort-centred and ranked Iron Age societies, etc.) which have guided archaeological research. The consequence has been even further cementing of the stereotypes (Chapman 1999, 67).

27 A. Šonje should be mentioned for publishing finds from several open-air sites in the Poreština region, and considering most of them to be Iron Age necropoles (Šonje 1966)
3) **The contemporaneity and stability paradigm.** Based on the data provenancing from prominent, large settlements, it has been repeatedly asserted that once settled, hillforts have long and continuous histories. Sometimes the difficulty of the construction has also been pointed to as an additional argument (Karouškova-Soper 1983, 72). This attributes to an overall impression of stability and limited or gradual change.

4) **The territoriality paradigm.** The idea of territoriality (c.f. Novaković 2001), either in terms of direct power relations or of an economic zone and notions of local sustainability, is essentially an outcome of the three preceding assumptions: that is, the image of stable, permanently settled fortified sites surrounded by, in most cases, a blank procurement zone.

The hillfort paradigm has been the major issue we hoped to tackle with in the field survey. It is not a coincidence that the second season of the survey, when a more detailed methodology was deployed, was centred on the foothill of the Kaštelir hillfort. Previously, Bronze Age fragments were found in the construction trenches nearby and in a dolina east of the hillfort. The other problems listed can also be addressed by field survey, but with increasing difficulty. Spatial patterns of open-air sites may provide some clue to the centrality of a hillfort, that is, its position in the overall organisation of settlements across the landscape. Contemporaneity could be easy to assess in favourable conditions – in the abundance of well-preserved artefacts. However, we have not been able to obtain good samples even from hillforts, let alone from ploughsoil scatters which are generally in a very poor condition. And finally, it has to be noted that the Umag survey paid special interest to hillfort sites, thus replicating, perhaps, some of the common research bias. In the discussion that follows we will try to demonstrate that hillforts are indeed very important for the understanding of the overall settlement pattern and should not be circumvented. (An analogous issue has been dealt with by Snodgrass and Bintliff in the context of the Classical Greek countryside and urban agglomerations; Bintliff and Snodgrass 1988a).

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28 P. Novaković has already pointed to the fairly small amount of work that had to be invested in the rampart construction of average hillforts, in spite of their impressive appearance. He refers to the estimates of the man-power required for the work proposed by the Neothermal Dalmatia Project (Chapman, Shiel and Batović 1996, 158-175, Novaković 2005, 304).
Figure 43 Bronze and Iron Age sites in the study area.  

9.2 Survey results

9.2.1 Hillforts and necropoles

Kaštelir

Kaštelir near Umag is a well-known site, excavated already in the nineteenth century, but not since. The brief report published in 1888 has until this moment provided the only information on the site and will be

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29 Previously known sites: Crveni Vrh - Barafito (Bekić et al. 2008), Sv. Petar (Buršić-Matijašić 2007, 433), Romanija (idem, 432), Sipar (idem, 435), Kolumbanija (Lonza 1977, 39), Markovac 1-3 (Marchesetti 1903, 76-77), Kaštelir (Buršić-Matijašić 2007, 432), Kaldanija (Lonza 1977, 69), Umag (Bolšec-Ferri 2006; Čučković 2009), Markocija (Mihovilić, Bradara and Komšo 2004), Sv. Ivan (Buršić-Matijašić 2007, 430).
discussed into some detail later on because it has caused serious misunderstandings ([Amoroso] 1888). In the same report we are also informed that Kaštelir had previously been visited by the famous historian and archaeologist Pietro Kandler ([Amoroso] 1888, 506; Matijašić 2005a). The site has also attracted local enthusiasts ever since, as we have learned form the local inhabitants. Their impact on the site cannot be estimated.

The hillfort is placed on a slight crest which forms the southern rim of the calcareous plateau of the Bujština anticline. Immediately below the hillfort the Umag terra rossa plain finishes abruptly in front of a mild slope (Figure 44). The terrain on the slopes under the hillfort is stony, sometimes with more rock outcrops than sediment cover (the toponim Grote appears just underneath the hillfort). On the upper area, adjacent to the site, there seems to be more soil, presumably because or rather flat terrain. The presence of small drystone enclosures on the south-western slope indicates small-scale cultivation with herding, but on the upper side of the plateau, where conditions seem more favourable, similar installations are not visible on the map, nor were observed during the survey. Further to the east lies the village of Sv. Marija na Krasu and a fine example of a typical enclosed karstic agricultural landscape (see Figure 68, p. 157).

The fieldwork on Kaštelir was seriously impeded by thick, almost impenetrable Mediterranean scrub. Some parts of the site could not be inspected by any means and movement on much of the site is severely restricted, usually not enabling standing in upright position. Therefore many details were probably missed, especially in the immediate surroundings of the enclosed area. However, there is a wide and accessible strip of cleared vegetation stretching across the site, made for power line maintenance. In this area some minor destruction by machinery used for clearance has exposed parts of archaeological layers, enabling pottery collection. Destruction of ramparts, inflicted during the construction of a water supply pipeline, is still visible at several places. This can also be deduced from the 1:5,000 map, but the actual position of the pipes may differ a couple of meters from the mapped ones. Almost as a rule in the Umag environs, this hillfort has also been used during military operations in the Second World War, when a trench and some small pits were dug in along the interior rampart and on the eastern side of the main rampart.

The site is encircled by a large rampart composed of stone and earth (Figure 44: 1, 3). A minor rampart divides the site parallel to the steeper slope on the southwest (2). An interesting feature is a band of small stone rubble about 30 m wide that is spread along the eastern course of rampart (6). It is possible that a similar, though less pronounced feature is present at the western part of rampart as well, but due to very thick vegetation it was not possible to record it. What had been identified in the area adjacent to the western course of rampart are very low (c. 30-50 cm) embankments which might have also been produced
by pipeline digging. The original entrance features were not identified with certainty, possibly because of the mentioned recent destruction (a possible passage on the eastern part of the rampart lies on the position of pipeline: 4). The construction technique of the rampart could not be discerned, but it apparently contains a larger proportion of soil than hillforts on rocky terrain. In this respect it is similar to Sv. Petar and Romanija. The lack of typical larger stone blocks was noted already in the nineteenth century ([Amoroso] 1888, 506).

Based on the nineteenth-century excavation, the group of mounds on and around the hillfort can be interpreted as a tumuli necropolis ([Amoroso] 1888, 506-7). Our survey has not identified the full extent of the necropolis because of the impenetrable vegetation covering most of the site. What is important is that the tumuli overlay the eastern rampart, as they are set against the slope of the rampart where a small stone rubble might have provided readily available building material. In this case the unusual strip of small stone rubble stretching along the ramparts would be, at least in a large part, an original prehistoric feature, and not a product of later agricultural clearing as it might appear at the first glance. The interior of the Kašteli hillfort might have been cultivated after the abandonment of the prehistoric site, but the preservation of the tumuli suggests that this activity could not have been very intensive. As often in the case of hillfort ramparts, there is also a narrow passage present, which that might have served for sheep flocking in recent history (south-western rampart).

The formation of the tumuli necropolis implies an early date of settlement abandonment, as these are also typically dated in Early to Middle Bronze Age (Istra II-III), while the disposition of the ramparts may indicate a successive development of the settlement, rather than a single construction event. Pottery fragments gathered during the visit also date from this period (see p. 148). Therefore our findings are quite consistent with a scenario of an Early-Middle Bronze Age settlement abandoned and reused as a necropolis sometime in the Istra III period, if not already during Istra II. However, the nineteenth-century excavation has been interpreted by other scholars as depicting an Iron Age necropolis because of the supposed find of burial urns and remains of incinerated bones. Marchesetti also published a bronze spear tip, dated by Š. Batović into the Late Bronze Age (Ha A-B phase) (Marchesetti 1903, 92; T. IX: 19, 20; Batović 1983, 293; Buršić-Matijašić 2007, 432).
Figure 44 Kaštelir: topographic survey. Recent transformations are marked in magenta (water supply pipelines and military trenches) and topographic contour lines in blue (each 5 meters, dashed 2.5 meters).
Late Bronze Age, Iron Age, or any other subsequent finds were not documented in the 2008 survey, and it seems that intensive settlement would be inconsistent with the preservation of a tumuli necropolis in the centre of the hillfort. The problem is, we assume, in the non-critical reading of the 1888 report. It seems that Amoroso’s description reveals a typical Bronze Age tumulus with a construction of stone slabs, but unfortunately it is not evident if these formed typical cist graves or some other possible layout. It is also obvious that dark soil, ash, bones, and charcoal that are frequently mentioned emerge from both the barrows themselves and the underlying settlement layers, and cannot be readily interpreted as cremation traces. Finally, two spurious details remain. The mention of burnt human remains should be taken with caution; such information should be suspected even in a modern report, unless based on specialist opinion, let alone in the case of a pioneer dig from the nineteenth century led by laymen and enthusiasts. Furthermore, together with the bones there were animal teeth, something much easier to identify. The same applies to the usage of the term “urn” in the Amoroso report: there is no information on the context of the find and most probably it refers to a large piece of pottery comparable to the Iron Age urns that Amoroso himself excavated in Beram and Picugi only a few years prior to this campaign (Buršić-Matijašić 2007, 286, 401).

The chance find of a single bronze spearhead published by Marchesetti (1903, T. XI: 19) and dated into the Late Bronze Age (Ha A-B) by Batović (Batović 1983, 293) should also be critically examined. There is no further explanation of the find in the original publication and, as we have argued before, Marchesetti most probably did not visit Kaštelir (see page 113). B. Lonza is of the same opinion (Lonza 1977, 25). In sum, the scenario of Late Bronze-Iron Age settlement on Kaštelir does not seem to be founded on solid evidence, such as would be necessary in order to argue for an unusual case of a settlement among untouched tumuli, or a unique urn burial under a barrow of typical Bronze Age construction, a tradition yet unknown in Istria. On the contrary, a careful reading of Amoroso’s report reveals some details supporting the Bronze Age dating of the tumuli.

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30 On that occasion two excavations of tumuli were made, a brief one by Alberto Puschi, the head of Museo civico di antichità in Trieste (Mihovilić 2005, s. v. Puschi, Alberto), and soon after a bigger undertaking by Amoroso and signori de Franceschi ([Amoroso] 1888, 506). Puschi explored one small mound, recovering dark soil with small pieces of pottery and some charcoal. This exploration sparked curiosity (“una grande curiosità”) in the author and signori de Francheschi who had a large estate nearby (Seget stanza), so they set out for a larger excavation with twelve workers. First they made a more thorough exploration of Puschi’s barrow, where they uplifted a spheroid stone block 150 cm in circumference and “just as high” (at maximum a 50 x 50 cm stone). Underneath was another layer of ash, charcoal, pottery sherds mixed with some burned human (sic) bones and animal teeth. Afterwards the work transferred to a barrow 6 m in diameter and 0.5 m high, where a number of vertically set stone slabs was unearthed, while it was observed that they were placed in a manner to adhere one to another. Whether this means a row, stack, or cist layout is not clear. Deeper on, the excavators saw more rock and sherds mixed with black earth. Eventually they reached bedrock, thus exploring much deeper under the barrow layers. To the unhiddden disappointment of the excavators, the finds consisted of a half of a pre-Roman urn (“urna preromana”), a piece of flint, some burnt bone and hardened ash ([Amoroso] 1888, 505-507).
As is the case with several other hillforts (Glavica, Sv. Petar), Kaštelir also had an adjacent open-air settled zone. Scarce pieces of prehistoric pottery were found in trenches opened for new constructions in Ungarija, as well as in the trench for the water supply descending from the hillfort, built in 2008. Finds were inside the thin dark soil that is typically formed between calcareous outcrops, so that no archaeological stratigraphy could be identified. The area is completely unsuitable for agriculture today, but since it lies some 50 m from the Umag terra rossa plain, the site may be interpreted as a settlement or some activity area that benefited from the proximity of both the good soil and the security of the hillfort. The geological setting might be favourable for construction in terms of drainage and the availability of construction material (i.e. stone). As the inspected area was confined to narrow trenches and soil profiles, it is not certain whether the scarcity of discovered finds offers a reliable image. The rest of the terrain is overgrown and too inhospitable for surface inspection.

Figure 45  Ungarija findspot.

*Markocija plateau*

The Markocija plateau presents a very interesting ensemble of sites from different periods in a typical hospitable karstic setting. It is situated on a calcareous ridge 80 m above the Umag plain, and is partly covered with thin black soil and some terra rossa, while the karstic depressions and gentle slopes to the north and east still preserve a good layer of topsoil for agricultural use (olive trees). One cave and one pit have also been discovered there, signs of an evolved karstic environment (Mihovilić, Bradara and Komšo 2004). We shall deal only with prehistoric sites here, although the Pula Museum team recorded one Roman site and several others dating from later periods (*ibid.*).
Markocija was a *stanzia*, a large estate typical for the Istrian countryside in the period between the eighteenth and early twentieth century, and along with some other signs of habitation, such as the house within the Glavica hillfort ramparts and a small settlement of very crude drystone buildings, testifies to intensive human activities on the site in recent history. Mihovilić and Komšo consider the latter to be shepherds’ shelters (Mihovilić, Bradara and Komšo 2004, 71). The upper part of the plateau is quite stony and was most probably used for pasture, which is also signalled by a developed network of drystone walls. However, there are extensive ridge and furrow marks on the upper area of the plateau, indicating past ploughing even where the soil layer is quite scarce (also see p. 76). The use of the site in the Second World War should also be mentioned, although traces of small trenches and some ammunition were observed only in the foothill of the hillfort. The small shelter seen in Figure 34 may be related to this period.

![Figure 46](image)

**Figure 46** Markocija plateau: a possible tumulus in the front and ploughing marks behind (ridge and furrow). Another mound is visible on the left, in the direction of the path.

An important natural feature for husbandry activity is a water pond that was fashioned inside one of the shallow dolinas. It should be kept in mind that these features cannot be assumed to be of great antiquity, because they are often man-made structures, requiring periodic maintenance. Still, the occurrence of water ponds indicates the existence of favourable, thick clay deposits in the lower parts of topsoil implying the possibility for such water management solution at any time in the history of the Markocija plateau. Overall, the historic human interventions on the Markocija plateau seem to be considerable, in spite of the rather poor, karstic setting.
The highest point on the Glavica hilltop is actually a large cairn situated inside a roughly circular Bronze Age hillfort. We have found no clear bibliographical references to the hillfort so it may be a hitherto unknown site. The hillfort enjoys a wide view on the Umag plain and coast. The single rampart is on average 2.5 m wide and some 0.5 m high. The south-eastern part of the rampart follows the sloping edge of the calcareous plateau and here a larger quantity of tossed stone is visible. The south-western
segment of the rampart is better preserved, displaying a drystone structure made from larger stones (30 x 50 cm) that formed the outer face of the wall, while most of the structure on the flat area is composed of earth and small stone. The original entrance(s) have not been defined. Openings in the rampart visible today seem to be the result of activities after the abandonment of the Bronze Age site. The cairn occupying the highest point of the hillfort is 25-30 m in diameter and 1.5-2 m high, surrounded by a small rampart 2 m wide and 0.5 m high. On the top of the cairn traces of some possibly circular drystone structure are visible, a feature that reminds us of similar arrangements at the Bronze Age barrows in southern Istria (Codacci-Terlević 2004, 56-57, Gnirs 1925, 41: Monte Val Marin). However, as the cairn is the highest point of a larger area, it bears traces of significant recent disturbance, from the buried geodetic point to traces of visits by hikers and tourists. Later on in the Umag survey we discovered many shepherds’ shelters that reuse prehistoric cairns, often producing small rectangular or circular stone alignments. Therefore, this find cannot be interpreted without better research.

Figure 49  Circular structure at the top of Glavica cairn.

The hillfort is today on the very edge of a large golf course covering most of the Markocija plateau, and the survey of the Pula Archaeological Museum that preceded the construction of the golf course identified sites from several periods but not the hillfort structures (Mihovilić, Bradara and Komšo 2004). Two groups of small mounds 3-4 m in diameter were found, along with a very interesting dolina site that contained prehistoric pottery at the depth of 60 and 100 cm (idem 71). However, these features were not thoroughly recorded by our team before the massive destruction of the entire terrain took place during 2008. The idea was to undertake a rescue excavation on the construction plot, but this never happened. Today a large part of the golf course is covered with sparse prehistoric finds as the soil from the dolinas has been dug out and spread around as, we suppose, grass substrate, while most of the tumuli were also levelled out. In the end a serious survey of the site has not been made, including a thorough finds collection, while hopes for rescue operation have dwindled away (in spite of the Pula Museum survey in
2004 and our written protests on the occasion of the devastation). The destruction has also revealed an archaeological layer adjacent to the north-western side of the hillfort ramparts, as well as some finds around the entrance to Markocija cave. The pottery found is very fragmented and no diagnostic sherds were identified. The pottery fabrics range from grog-tempered to porous and sand-tempered, overall attributable to the Bronze Age, but other periods may be present as well. Some finds can be dated to the Roman period.

Sv. Petar

Sv. Petar (St. Peter) is the patron saint of the early medieval church situated on a prehistoric hillfort site. The hillfort has been known since the nineteenth century but no research has ever been made on it (Buršić-Matijašić 2007, 433). The site, situated on a stony Savudrija ridge, offers a splendid view stretching to the Alps and much of the Umag coast. Due to its geographical setting, Sv. Petar shares the same geology and climate as other sites that are positioned in a row on the crest of the ridge (Markovac I and Kolumbanija). A noteworthy similarity is the strong incline of calcareous layers in the northern direction, parallel to the ridge, which has produced ribbon-like outcrops usually between ankle and knee size. As soon as one attempts movement outside of the trodden paths that usually follow the direction of the outcrops, the constraining effect of geology on free movement becomes evident. Immediately below the hillfort is a larger karstic dolina (or a small polje), Francenoža, covered with a thick layer of soil that is less heavy and clayey than the usual terra rossa, due to a higher content of dark, organic material. There seems to be a problem with water retention in the dolina, as observed in December 2008 when patches of water were visible in the fields and some parts of the dolina remained damp and muddy during several weeks. Nevertheless, the dolina is intensively cultivated today, partly with damp-resistant corn, and some reed has also been planted for the purpose of drainage. Water retention is much more pronounced in the Valkadin dolina, some 600 m to the southwest, which becomes completely flooded after a prolonged period of heavy rain, more or less once a year.

Finally, one more environmental characteristic should be mentioned. The Savudrija Bay ridge is an important barrier against the cold, very dry, violent bura wind (see p. 80), and Sv. Petar lies on top of it. We are not able to assess the importance of this aspect for the ancient settlers, but given that this wind regularly causes thin surface freezing on the eastern Adriatic due to its low temperature and very pronounced evaporation effect at least considerable discomfort can be assumed.

The site has been cultivated in the nineteenth and the first half of the twentieth century to some extent, judging by the remains of drystone walls in the western corner of the hillfort. The lower part of the hillfort on the south-western slope has until recently been occupied by an olive grove, and the dolina
below is still cultivated. It is, in fact, the terrace created behind the hillfort ramparts which has provided a pocket of fertile soil, while the aspect of the slope collected sun and warmth for the crops (olives). Another narrow terrace has been cut into the rampart itself for agricultural purposes only (we suppose), thus probably enlarging the width of the prehistoric feature. Buildings that still survive in the south-eastern corner of the hillfort do not appear in the map from the end of the nineteenth century (Figure 51) and seem to have some observational function. Large parts of the site were transformed by military trenches and other features of similar function, especially on the eastern side (cf. infra). According to Benedetti, they date from the First World War (1973, 10).

Shortly before our research, the hillfort was badly damaged during the broadening of the road which traverses the site. A significant portion of the ramparts on both the northern and southern sides was levelled out and waste of the material deposited along the north-eastern slope, masking possible archaeological features. This action has also brought to light a massive amount of archaeological finds and uncovered thick occupational layers of black or dark brown colour.

The Sv. Petar ramparts are extraordinary when compared to other prehistoric hillforts in the Bujština region: the north-western section (Figure 50: 1) is up to 7 m high and accompanied by a shallow ditch, while the eastern is 3-5 m high, also with a large, shallow adjacent ditch. Both ramparts show significant traces of military trenches. The north-western one does not seem to be significantly altered, except for the northernmost tip, but the opposite one (2) shows many traces of reworking, not only of trench digging, but also of construction of some platform-like features. It may be that the entire rampart had been significantly lowered on the occasion. Consequently, while ramparts must have originated in the prehistoric phase, we have not been able to discern any original characteristics. The lower rampart (3), constructed against a steep south-western slope, while probably of prehistoric origin too, has also been significantly altered, as already mentioned. The upper ramparts are constructed with a large amount of soil, a feature not characteristic of typical hillfort sites (even if the “rockiness” may be due to postdepositional processes rather than a direct outcome of construction practice), while the lower one is mostly composed of stone rumble which, again, may partly be a result of agricultural practices.

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31 The nineteenth-century map possibly shows an aerial telegraph. The building shown on the same map would correspond better to a possible perished house on the western corner of the site, where there are still preserved drystone walls and an agricultural terrace. However, the scale of the map is too coarse (1:75,000 but the fineness of detail is between modern 1:50,000 and 1:25,000 topographic maps) and the mark can also refer to the church, displaced to avoid overlap of symbols.
The eastern rampart (2) seems to have been completely reshaped in the period during and after the construction of the early twentieth-century buildings (5), and especially in the course of the mentioned military operations. Its inner side is levelled into a long slope that presents no obstacle for movement, while the outer side is quite steep and features some butted structures, probably traces of recent military occupation. Behind the building on the southernmost part of the upper plateau (5), a further series of military trenches was recorded. It seems that the wide, shallow ditch on the outer side of the rampart may be earlier than the recent activities, but we have found no clue to its dating. It should be noted that it resembles a similar feature on the opposite side of the hillfort.

The northern edge of the site was completely destroyed upon our visit, as it was used for dumping the material cut out from the western rampart and other places within the hillfort. Only a recently made terrace can be seen now. It is possible that because of the rather steep slope no rampart was necessary, as

Figure 50  Sv. Petar: topographic survey (contour lines: 5 m).
in the case of the opposite side of the site, where the slope is steep, stony, and hard to ascend because of ledges formed by protruding calcareous outcrops.

Today the hillfort has four entrances on the top plateau, and only the western one (6) has been spared from devastation by road construction. The western entrance is up to 3 m wide, and a corresponding path 4 m wide can be discerned on the grass-covered terrain. The stonework supporting the loose material of the rampart is comparable to the historic agricultural features and the dating of the preserved entrance should be sometime after the Middle Ages. However, some other clues suggest that the western entrance could be a feature of the earlier hillfort layouts as well. First of all, in the nineteenth century the western entrance was the best way for entering the hillfort interior (Figure 51). The disposition of the ramparts adjacent to the western entrance, protruding down the entrance path, may also indicate that the entrance on this spot had already been planned in the period of rampart (re)construction. This action cannot be dated as the Sv. Petar ramparts show signs of significant changes and adaptations. The other entrances are badly preserved and do not show enough information for any interpretation.

Figure 51  Sv. Petar on the nineteenth-century map (K.u.K.Spezialkarte 1903).

In the Francenoža dolina just under the lower rampart, a thick scatter of Prehistoric and Roman finds was discovered, accompanied by a marked change in soil colour. The scatter continues toward the lower rampart, but due to the vegetation cover it could not be recorded. The densest area of the scatter was designated for intensive finds collection in a 10 x 10 m grid. The grid covered one ploughed field and the conditions of collection were uniform throughout its area (complete visibility, weathered and very damp soil). All the finds are rounded and very tiny (Figure 53), showing very marked traces of long-term abrasion. As visible in Figure 54, most of the collected pottery pieces are prehistoric, and by the preponderance of grog-tempered fabric probably chiefly of Early to Middle Bronze Age dating (see the pottery analysis, p. 151). The Roman period is also present but in much lesser amount. What is quite odd is the very small quantity of brick and tegulae. The rather low amount of ceramic building material indicates that probably no typical Roman construction stood in the foothill. More likely is some Late Iron
Age/Proto-Roman context comparable to the development on the upper plateau of Sv Petar. There is also a possibility of an Iron Age necropolis in the foothill of hillfort, as similar topographic setting can be seen on many prominent sites like Pula, Picugi, and Beram (Gnirs 1925, 46; Buršić-Matijašić 2007, 287). However, no finds that may support this hypothesis have been found (specific pottery forms, fine or imported ceramic ware, metal objects, etc.). Other, sparse finds include one certain and several possible Late Roman/Early Medieval pottery fragments of porous ware, pieces of iron and bronze (impossible to date with certainty as we were informed by Kristina Mihovilić from the Pula Museum).

![Figure 52](image)

**Figure 52** The Sv. Petar hillfort in a wider topographic setting (Crveni Vrh tumulus necropolis to the west, and the Francenoža dolina to the south-west) (contour lines: 10 m).

Interestingly, the Francenoža assemblage differs markedly from the hillfort one, even if the latter has been collected unsystematically and has to be somewhat biased, for instance in favour of Roman finds, which tend to be more massive and conspicuous. On the other hand, prehistoric grog- and lithic-tempered pottery is roughly similar in its repertoire of vessel forms and the quality of fabric, and thus should not be
as strongly biased by the unsystematic collection strategy on the hillfort. Certainly, the problem is how
the processes that have formed the hillfort assemblage are related to the site stratigraphy. Deeper levels
should be considered as underrepresented unless proven otherwise. In any case, we believe that such a
discrepancy has to be understood in terms of the assemblage composition, although because of different
methodologies the two assemblages cannot be compared directly, i.e. statistically. It can be safely
concluded that the Francenoža assemblage demonstrates an evolution reverse to that of the hillfort, i.e. a
peak of activity in the Early to Middle Bronze Age, which waned in the Iron Age, when the hillfort seems
to have particularly prospered.

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**Average weight of pottery finds**

- **Prehistoric-Bronze Age:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams

- **Roman building ceramics:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams

- **Recent:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams

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**Glazed ware (modern):**

- Grog-tempered: 1-300 grams
- Lithic-tempered: 1-300 grams
- Roman pottery: 1-500 grams

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**Surveyed tracts:**

- **Prehistoric-Bronze Age:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams

- **Roman building ceramics:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams

- **Recent:**
  - Grog-tempered: 1-100 grams
  - Lithic-tempered: 1-300 grams
  - Roman pottery: 1-500 grams
**Figure 53** Finds collection in a 10 x 10 grid in the Francanoža dolina underneath the Sv. Petar hillfort (grog-tempered pottery is shown in the grid on the map, together with the southern extension of what is probably the same finds scatter).

**Figure 54** Composition of recovered pottery samples by fabric/date.

Some finds have been recovered from the limestone ridge east of the settlement. A few fragments of prehistoric pottery emerged immediately beside a small dolina (15-20 m large), and most have probably slipped out of it through an opening cut by the present road (easternmost scatter on the map). Very interesting is a group of finds recovered within the destroyed or redeposited sediment along the modern path leading from the south-eastern corner of the upper plateau. Large pieces of both fine and coarse pottery were found, along with a few unidentified iron objects. Given the position of the find and the lower degree of fragmentation, these may indicate a site of an Iron Age necropolis. However, as some, if not all, of this material may originate from the redeposited rampart fill, due to the mentioned road construction event, the necropolis can only be a hypothesis.
Crveni Vrh necropolis

In 2007 a probable tumuli necropolis was identified some 700 m west of the Sv. Petar hillfort. It took some time and a visit of colleagues from the Pula Museum to establish that it could indeed be a prehistoric site. Later on we were also informed by colleagues from the Croatian Conservation Institute that during their rescue excavation for the purposes of the Crveni Vrh golf course they had put a trench on one of the small mounds in the autumn of 2007 and discovered disturbed layers, but with some prehistoric pottery dated to the Bronze Age on the contact with bedrock, implying a possible devastated tumulus. Four holes lined with stone were also recorded in the mound fill, but without traces of mortuary ritual. In order to test whether these finds come from a settlement layer underlying the mounds, the excavators have made two test trenches as well, but with a negative outcome. They have been unable to propose any interpretation of the finds, and consider the tumuli necropolis as “unconfirmed” (Bekić et al. 2008, 245). In the course of our work on Crveni Vrh we have collected no datable finds from the surface deposits (except for a few tiny pieces of prehistoric pottery that were too meagre to be collected). Scant and very fragmentary pottery fragments inside the tumulus fill have also been documented in the Marić Bay near Barbariga, and can be considered as usual finds in this type of context in the entire Adriatic area, probably as traces of a ritual fragmentation and scattering of artefacts (Codacci-Terlević 2004, 56; Marović and Ćović 1983, 204).

The location of the necropolis is the slope and the summit of a rocky hill presently used for pasture and divided in a sort of terraces by wide horizontal embankments. The geology is similar to the rest of the calcareous ridge that runs along Piran Bay, but without pronounced ledges and outcrops that have a strong impact on movement on the terrain. The soil layer is thin, very rocky, and sunk into limestone, so the area has most probably not been subjected to intensive agriculture. We can imagine only sparse olive and vine grown at the location. The surveyed location is today under pasture, and is partly grown into Mediterranean bush (predominantly Spanish Broom) which only in a few places poses a serious obstacle.

bility is quite good, as is usual on grazed terrains, except in areas of dense scrub to the west. The rest of Glavica hill is under very diverse land use regimes today, and is mostly inaccessible for detailed survey. The lower part of the necropolis, below the asphalt road for Crveni Vrh and the dirt road leading to Francanoža dolina, is covered in impenetrable scrub and could not be surveyed. By the year 2008, the construction of the Crveni Vrh golf terrain had already begun and much of the lower parts of Glavica slope under the Crveni Vrh stanzia had been defaced.

An enigmatic trace of probable past agricultural activities on the site are rows of wide embankments running both parallel and, in fewer cases, perpendicular to the slope. These are not typical terrace remains, as could be expected, because in many instances the height is often slightly above the inner soil
surface, while the width that sometimes surpasses 10 meters seems to be quite uneconomic in terms of providing enough flat surfaces for tillage. The preservation of presumed prehistoric mounds on the inner side of the embankments also indicates non-intensive use (waste stone is most effectively tossed off over the embankment, rather than piled up in the interior space). We have not been able to deduce an approximate date of the embankment construction, apart from post-Bronze Age as they often incorporate presumed Bronze Age tumuli.

Figure 55 Crveni Vrh necropolis (contour lines: 5 m, dashed: 2.5 m).
Extensive traces of military trenches have also been documented on the Glavica hill. These sometimes use the existing embankments, and in rare cases presumed prehistoric mounds as well. The circular hole surrounded by a small embankment of excavated soil on the south-eastern corner of the slope, c. 9 m in diameter, is comparable to finds from the slopes of the Markovac and Glavica hillforts, interpreted as remains of some wartime facilities. Overall, military activity does not seem to have caused much damage on the site, in contrast to embankment construction, which has completely shaped this part of the landscape.

Judging by the distribution of the Glavica mounds and the coverage of the survey, the northern and eastern edges of the necropolis can be determined by the survey data, but the southern and the western one, down and along the slope in the direction of Crveni Vrh, have not been reached. The three largest mounds (c. 25-35 m in diameter) are placed on the edge of the hilltop plateau, on a position directly facing the Sv. Petar hillfort. The rest of the mounds show no clear differentiation in size, around 10-12 m on average, even though those closer to the hilltop are higher and more visible, probably due to better preservation than to original differences in size. The construction seems to incorporate equal amounts of soil and small stone, even if in many instances mostly stone is visible, which we tend to see as an outcome of weathering. The tumulus in Barbariga had a comparable cover of soil and small stone 15-25 cm in thickness, which covered a layer of larger stone blocks placed on the natural surface (Codacci-Terlević 2004, 55). However, on the site of Vetva in the interior of Istria (Pazin area) the tumulus fill was made mostly of local soil (Mihovilić 1989), so that local variations depending on the available construction material should be expected.

The central part of the hilltop was not used for the placement of mounds and no traces of possible features were spotted there. The plan shows two discernible groups of mounds: the upper group, forming a half-circle around the hilltop, and the lower one, on the southern slope. We are not sure whether this observation has any real value. For comparison, the Mušego necropolis, situated on a hill opposite from Monkondonja hillfort, displays a completely different pattern. The tumuli are concentrated in discrete groups of two to four, in an area several hundred metres large (a plan of the entire necropolis is not available), and the hilltop position seems to be preferable (Hänsel et al. 2009, 92). Apparently, the Crveni Vrh necropolis is similarly related to the Sv. Petar hillfort, as suggested by unobstructed visual communication between the largest mounds with the settlement. However, only 800 m to the west another Bronze Age settlement is situated, Crveni Vrh-Barafito, today completely destroyed by the Crveni Vrh golf course (Bekić et al. 2008). Thus the necropolis is at approximately the same distance and equally accessible from the two hillforts, but the surveyed part is not as clearly visible form Barafito. In fact, a
significant portion of the site is visible from neither settlement, but is rather orientated towards the *terra rossa*-covered, undulating terrain to the south-west (see chapter 9.3.3, p. 166, for visibility analysis).

**Kolumbanija**

The geographic setting of the Kolumbanija hillfort is similar to other sites on the Savudrija ridge: a dense grill of ankle- to knee-sized limestone outcrops and isolated pockets of arable land in karstic dolinas. A common feature is also a splendid view on both Piran Bay and the interior of Bujština. Among the group of surveyed hillforts this one is the least affected by recent activities and there seem to be no major traces of intensive use in historic times. For all hillfort sites we suspect minor alterations due to herding practices in the periods after their abandonment, given their enclosed layout with preserved ramparts, and the material for their reparation at hand. The eastern side of the site is sparsely overgrown in scrub and does not pose too many problems for fieldwork. The western part, however, is heavily overgrown – especially the south-western, which is protected from wind – rendering any detailed survey impossible without large-scale clearance.

![Figure 56](image) **Figure 56** Topographic setting of Kolumbanija hillfort (contour lines: 10 m).

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Kolumbanija was excavated previously, but no detailed information is available to us other than a plan of two entrances (Lonza 1977, 39). It seems that the excavation was concentrated on the clearance of the rubble covering the eastern entrance only. The hillfort was also sketched and briefly described by Marchesetti (1903, 77-78, T. IX: 4).

The hillfort ramparts seem to be considerably preserved. The section that lies vertical to the access path climbing along the ridge to the south-east is approximately 6 m wide and composed of a large quantity of stone rumble, while the rest of ramparts is on average 2.5 m thick. On the inner side of the stone heap a longer section of the original wall, about 1 m wide, can still be seen (Figure 58). The stone used for construction is mostly larger quadrangular blocks that have been laid flat in what seem to be very rough rows, a technique comparable to the upper ramparts of the Markovac I hillfort. The upper parts of the structure have probably been subsequently repaired with smaller stone. 10-15 m to the north of the main rampart a small appendix is situated, comprised of stone rumble some 3-4 m wide and barely elevated from the rest of the terrain.

The main entrance is very narrow, 60-70 cm in width, and had been elaborated with a passage that runs at a right angle (Figure 57: left). This appendix is made of smaller stone plates and is clearly of a younger date. The size of the tunnel-like entrance is similar to numerous Bronze Age examples in Istria (Bačić 1970). There is one more entrance, on the opposite side of the settlement, also dated to Bronze Age by Lonza (1977, 39). It is marked by two large, elongated limestone blocks that seem to be slightly disturbed (Figure 57: right). The state of the preservation of this feature, along with no trace of connection with some likely original structure, makes it difficult to assess its dating with some certainty. It seems to be more massive than the usual shepherds’ structures.

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32 Lonza credits the drawing to Manilio Peracca, former museum curator in Muggia (Trieste).
Figure 57 Kolumbanija: eastern (left) and western (right) entrances.

Figure 58 Kolumbanija, the eastern rampart wall.
The terrace created by rampart construction was not mapped in detail, but it measures 10-12 m in width on the northern side, and perhaps a little more on the opposite, southwestern side. The inner part of the hillfort is mostly rock, while some soil is preserved along the ramparts.

Few finds that have been collected are typical for Bronze Age hillfort pottery, perhaps somewhat later than those found at Kaštelir, judging from the fabric that is very rough with a lot of ground stone, similar to finds from Markovac II.

An interesting feature of the Kolumbanija hillfort is a small dolina immediately under the ramparts (due to thick vegetation it was not visible whether there is some structure connecting the two). This plot is still cultivated and at the time of the survey was covered with sparse weeds (resting no more than a year prior to the survey). A very large amount of fired clay was discovered there, mostly fragmented into tiny pieces, but no pottery fragments were observed. Another dolina was surveyed 450 m west of the hillfort, but the fields were either left to rest or were untilled at the time. On a small strip with somewhat better visibility (10%) only two fragments of roof tiles, a tiny fragment of possible prehistoric fabric, and some fired clay were recorded. This evidence is insufficient for any assessment.

Markovac I

The earliest information about the several Markovac sites is given by Marchesetti (Marchesetti 1903, 76-77). The hillfort on the highest position is labelled Chia, and a valuable drawing is provided from the time preceding the destructions in the course of the twentieth century. Upon Marchesetti’s visit a large cairn,
constructed by large calcareous blocks 7 m high and about 110 m in circumference, was still in good shape (besides some digging by supposed robbers).

As there are several prehistoric sites in the vicinity of Markovac hill, a good deal of confusion has emerged in subsequent publications. Lonza claims that Marchesetti’s Chia should be positioned at elevation point 162, named Mazzoria, and that it has been destroyed “for road pavement” (Lonza 1977, 25: note 3). We suppose that Lonza confused it with the one on Monte S. Marco on the 157 a.s.l., also known as Mira, which is here labelled Markovac II. The issue is only in toponimy, because Marchesetti does give the correct heights. The information on the destroyed site is, in fact, confusing: does it refer to yet another hillfort on the place of the stone quarry Plovanija several hundred metres to the east? However, on Lonza’s map Chia would better correspond to the Markovac III site (cf. infra) (Lonza 1977, 11). M. Barada’s article in the *Istarska enciklopedija* does not clear up the problem: there a system of three hillforts is mentioned, Markovac (162 m a.s.l.), Mazzoria (136 m a.s.l.) and Mira (132 m a.s.l.). Markovac II is missing, but still three sites remain! Mira is placed on the hill with the cave, opposite of Markovac I, while the cave is supposed to be in “the immediate vicinity of the hillfort” (Barada 2005).

The toponimy has changed significantly since Marchesetti’s time and today only the northern hilltop is named Markovac, while neither the southern hilltop nor the cave site bear label on 1:25,000 or 1:5,000 maps. Therefore, in order to avoid further confusion, we use the names Markovac I and II for the northern and southern hillfort, respectively, and Markovac III for the hill with the cave.

The landscape of Markovac I is the harshest of all the hillforts surveyed. The climatic conditions do not allow for the development of thick vegetation on most of the site. On the northeastern slope only sparse juniper, phyllirea, and heath bushes survive, along with grass. The other side of the hill, sheltered from the northern wind, is more heavily grown with a rather stunted forest of Mediterranean oak and other sturdy trees and bushes. The archaeological site, however, spreads exactly on the wind-exposed north-eastern side, enabling a much more thorough inspection than on most of the other hillfort sites.

Limestone ledges and cracks are very developed here and indeed pose a serious problem for free movement. We have already stressed this aspect of the geological setting with regard to the other hillforts on the Savudrija ridge because on some other sites in southern Istria, laid on more gentle terrain, remains of constructions enhancing or imitating this effect have been found in front of Bronze Age ramparts. In Gradac-Turan above Koromačno Bay, a 10 m wide band of vertically set spiky stones was discovered 10 m apart from the hillfort rampart. The stones were “more than half a meter high”, and fixed by smaller cobble and compacted soil (Mihovilić 1997, 42, sl. 10). A similar construction has been reported for
Vrčin, where a band of spiky stones was 5-6 m wide (Mihovilić 1997, 43, sl. 47), as well as on the Brijuni hillfort (idem 48, sl. 15).

The Markovac I hillfort is remarkably well preserved in its lower portions, but the upper part has been severely defaced since Marchesetti’s visit at the end of the nineteenth century. The top of the hill was originally occupied by a large tumulus recorded as 7 m high by Marchesetti and already under threat of looters by that time (Marchesetti 1903, 76). During military operations which we suppose to date from the Second World War, the tumulus was completely levelled and probably used for artillery trenches, so that nothing but a chaotic rumble with occasional traces of small trenches remains today. At that time the drystone bunker that is leaning on the top rampart was also constructed. Along the slope of the hill overlooking the old road in the direction of Piran a number of small drystone protections (parapets) is still visible. Afterwards, a signal post for the Sečovlje airport has been erected on the terrace behind the second rampart, and more recently a watchtower for the frontier police and a mobile communications antenna have been added to the top plateau. Sometime during or prior to these destructions the road climbing the hill has been widened, destroying what might have been the original entrances. Electrical cables needed for the facilities were dug in along the road and across the ramparts. Smaller adaptations of the hillfort are also visible between the third and fourth rampart. A small path and what seem to be the remains of small enclosures may be related to pastoral activities. It is not possible to date these activities, but they must have occurred after the time at which this part or the entire hillfort had been abandoned. Herding activities may have been accompanied with rampart reconstructions and adaptations, posing serious doubts about the dating of the drystone walls that were found in better condition (that is, preserved to a height of a meter or so).
The top plateau is protected by a wall two meters wide, whose traces can best be seen on the eastern slope, while a large amount of stone rubble covers most of the surrounding slopes (Figure 60: 1). At a few places traces of drystone masonry are visible. As already mentioned, the large cairn that occupied the hilltop is completely demolished and only a roughly circular contour is visible today (5). The next lower rampart, labelled as rampart II, also features a 2.5 m thick wall that is in some places preserved to a height of a 1-1.5 m (2). The construction technique is not different from that of the upper rampart: crude stacking of large, flat stones. Considering the state of the other remains at the hillfort, the drystone structure of the
second rampart might be a consequence of herding activities, especially the opening in the wall that does not resemble typical prehistoric hillfort entrances.

Several vertically stabbed stone slabs were observed at the position of a military trench next to the road, underneath rampart II. This may indicate burials, which are in Istria frequently found close to or within hillfort ramparts. As the project did not include any subsurface research, this feature was not excavated and its interpretation remains inconclusive (Figure 61). An important find are scant remains of an earlier drystone wall some 2-2.5 m thick which occupied a slightly lower position than rampart II. Its state of preservation and topographic position indicate that it is a trace of an earlier, dismantled rampart, which is a rare example of distinctive chronological relationships visible on the surface of a hillfort site.

Along the northern slope of Markovac ridge runs a narrow path winding towards the second rampart, around smaller drystone structures (7). It may be that this is an original (prehistoric) communication route, but since there is evidence of apparently non-prehistoric adaptations of the second rampart, its interpretation cannot be proposed with certainty. Further down the slope is another drystone wall, labelled rampart III although it is markedly different from the upper ones (3). Ramparts III and IV do not have a typical adjacent heap of stone rubble and do not support any substantial amount of sediment. However, judging from their topographic position and average thickness, these walls should also be considered as ramparts. The third rampart is in some parts very well preserved and displays typical characteristics of the Bronze Age technique of two rows of vertically wedged flat limestone slabs filled with smaller, irregular stone in between (Figure 62: left). Between the third and the fourth rampart a series of elusive traces of human interventions on rocky terrain was encountered. Pronounced limestone ledges that stick out at 45
degrees in quite regular lines parallel to the ridge have apparently been used to support simple structures, visible as prolonged heaps or lines of larger stone, but we have been unable to define any understandable layouts. One narrow path follows the layout of the structures, but at some places also cuts through heaps of rubble from the earlier constructions, and we suppose it to be a trace of a herding facility reusing possible earlier structures. The only structure that could be identified with certainty is 11 x 18 m large, constructed in the same fashion as ramparts III and IV, and unlike the rest of the remains that surround it (Figure 60: 8, Figure 62: right). On its corners there are still some wedged stones visible and the interior seems to contain some sediment.

Figure 62  Detail of rampart III (left); detail of the rectangular structure between ramparts III and IV (right).

The lowest rampart is similar in both construction technique and current state of preservation to the third one, with approximately the same thickness (2-2.5 m in the part closer to the present road). What is curious here are traces of what might be entrance structures (9). The present road cuts through a rectangular structure which seems to correspond well with the abrupt ending of the rampart. It should be noted that the entrance structures of Istrian Bronze Age hillforts are more often than not thicker than the ramparts and take the form of elaborated winding passages (e.g. Kolumbanija, Monkodonja, Kunci, etc.). It seems that the opposite would be true in our case, so that the interpretation of the structure as an entrance construction should be backed with more detailed research. Close by is another passage, 160 cm
in width, which clearly has to be older than the road construction. In spite of its dimensions and position, comparable to Kolumbanija for instance, we cannot interpret it as a prehistoric feature without a better understanding of its relation to the rampart. Herding activities may again be responsible for the present state of the structure.

The Markovac I hillfort is quite outstanding in terms of the preservation of surface remains. We have identified two phases of its settlement, perhaps separated by a period of abandonment. The older one is presented by lower structures built in a characteristic technique of two faces made of wedged stone slabs and filled with smaller rubble, evidenced, for instance, in the Maškerada tumulus complex (Buršić-Matijašić 2007, 224). However, diagnostic finds that can be securely attributed to this period have not been recorded. The later phase can be dated to the developed Iron Age by means of a large fragment of a typical Timavo pot (see Ch. 9.2.2 for pottery analysis) that was found in the stone rubble under the first rampart (Plate 1: 6). The rest of the pottery observed is very coarse and usually with limestone or mica temper, indicating developed Bronze to Iron Age. Regarding the topography of ramparts, it may seem that the site has shrunk in size, but actually the opposite may be true. Unlike lower structures that stand on the barren rock, the upper ramparts hold a considerable volume of sediment, which we interpret as a sign of more intensive activity, perhaps of more dense or more prolonged settling. If our interpretation of the surface structures is correct and the drystone wall adjacent to the second rampart is indeed an earlier rampart, this would imply that most of the sediment held by the second rampart belongs to the younger phase. The earlier structure did not present a significant feature in terms of its volume and preservation at the time of reoccupation, and was dismantled or ignored.

**Markovac II**

As mentioned already by Marchesetti, the second Markovac hillfort is heavily damaged by the construction of a lookout (*belvedere*). A row of cypress trees seems to indicate some sort of decorative function of the site in the recent period, but terracing and some abandoned fruit trees still growing there point to agricultural use as well. The technique of drystone masonry of supporting terrace walls is identical to the one found at nearby field boundaries, close to the old Markovac *stanzia*, and is characterised by careful use of regular, prismatic stone, much smaller in size than the blocks favoured for typical prehistoric ramparts. Only the radial structure descending to the east from the uppermost terrace seems to be less affected by agricultural activities and is comprised of a low and wide heap of stone comparable to some parts of Sv. Petar and Markovac I. There is little doubt that the terrace system as visible today follows the original prehistoric layout, judging from their relationship with the radial

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33 "Essendo stato ridotto a belvedere, vene quasi completamente distrutto" (Marchesetti 1903, 77).
western rampart. Marchesetti points to traces of earlier hillfort ramparts in the foundations of today’s terraces (Marchesetti 1903, 77). Perhaps he refers to the larger stones that can be found here and there (Figure 63: right), but even if the stones come form the original rampart, they may have been rearranged during the construction of the belvedere. It should be borne in mind that at the beginning of the twentieth century the adaptation was “fresh” and the site was probably cleared of excess vegetation which enabled better visibility of possible prehistoric features.

![Figure 63](image)

Figure 63 Markovac II: holes and small mounds on the upper terrace (left), and crude stone masonry, possible indicator of the original (prehistoric) structures (right).

The top of the upper terrace is difficult to understand. K. Mihović has noted one larger cairn (Buršić-Matijašić 2007, 434), while we have been able to indentify a larger, amorphous, low heap of stone rubble. There seems to be some traces subsequent constructions (sheperds’ shelter?) within the stone rubble, and as the rest of the site, significant alterations have probably been made in the last century or so. We have also observed a scatter of very small, tightly packed mounds (Figure 63: left). The apparent traces of dug-out holes at the centre of the mounds may indeed indicate the antiquity of the features as looting is often a tell-tale mark. However, given the significant alterations of the site, we hesitate to interpret the features on the top as prehistoric stone cairns or tumuli, even if they are quite usual in such a setting (suffice it to mention the Markovac I hilltop or the Kaštelir necropolis discussed above).

It is possible that Markovac I functioned as a twin hillfort together with Markovac II, since they stand only 200 m apart. This type of settlement can be found elsewhere in Istria, usually with some architectural features that connect both of the inhabited hilltops (Marchesetti 1903, 118: “i castellieri gemini”). In the case of Markovac I and II such features do not exist, at least not as substantial structures, which does not permit the hypothesis of a compound, polycentric settlement. A model of a settlement at Markovac II and detached outpost at Markovac I may be more appropriate, but this is only a hypothesis which cannot be
verified against the small amount of data obtained. The contemporaneity of the two hillforts also cannot be proven, even if it seems likely, because only a handful of finds have been collected on both.

In 2008 the Pula Archaeological Museum team made a survey for the purposes of highway construction at the foothill of Markovac. They mention prehistoric pottery finds underneath the hillfort, but no spatial information is provided (Komšo and Čuka 2009, 335).

![Figure 64](image.png)

**Figure 64** Wider topographic setting of the Markovac I-III sites.

### 9.2.2 Pottery analysis

The largest sample of pottery pieces was gathered on the Sv. Petar hillfort, which has been recently severely damaged by road construction. A few datable pieces come from Kaštelir as well, while the other sites failed to produce pottery samples that comprise more than one or two diagnostic pieces. We have, therefore, paid special attention to pottery fabrics.

The Kaštelir pottery, although comprising only a few diagnostic pieces, suites well into the Istra II-III periods (Early to Middle Bronze Age) as defined by Čović (1983a, 1983). The fabric of the finds is the characteristic homogeneous one with occasional crushed ceramic particles, and with pronounced finish in burnishing (Plate 1: 1-3). Bowls with sloped thickening and a step on the inside part of the rim are very common for the period (Čović 1983, 119, sl. 10: 5, 6; Buršić-Matijašić 1998, T. 1: 8-13). A pot that
probably had a globular form, decorated with careless, but smooth channelling, has a direct parallel in the lowermost layer of Elleri hillfort, dated in bronzo antico, i.e. Early Bronze Age according to Central European chronology (see chronological table, p. 114) (Masseli-Scotti 1989, 510, T. I: 3). A documented stratigraphic context of this parallel should be stressed because of the general scarcity of such data form Istrian hillforts.

At Sv. Petar, due to the destruction that took place some three to four months before the survey (judging by the already grown vegetation), we have been able to collect a quantity of diagnostic pottery pieces ranging from the Bronze Age to the medieval period. Most of the material was found in destroyed ramparts, and a smaller amount was recovered from the damaged parts of the hillfort interior. Consequently, the original contexts of the finds are unknown.

The oldest group of finds can be dated to the Istra II and III Bronze Age periods. It is typical material that seems to be omnipresent at the castellieri. The pottery has few discernible additions in the temper, usually some grog and a small quantity of limestone. By the formal characteristics of the pottery we are able to deduce only a broad dating interval, Istra II to III, that is late Early to Middle Bronze Age (Br A2-C). Indicative is the rim with a characteristic sloped thickening of the interior, Pl. 2: 2 (cf. supra). Small tongue-shaped handles (Pl. 2: 3) are typical for the sixth layer of Vaganačka cave, dated to the Early and a part of the Middle Bronze Age (Br A-B) (Fornebaher 1987, 10-11, T. 6: 15). This type is rather common in Istria, e.g. in Monkodonja (Buršić-Matijašić 1998, T. 15: 271, T. 44: 642). The horseshoe-shaped handle (Pl. 2: 4) is characteristic for the Early to Middle Bronze Age in Istria (Istra II phase according to Čović) (Čović 1983, 126, T. XIII: 4).

Fragments Pl. 2: 6, 7, 9 have a more or less fine ground limestone temper in the fabric. Developed lip-shaped handles comparable to Pl. 2: 6 are numerous among the Monkodonja material, usually with a small dent on the bottom, but normally without a perforation (Buršić-Matijašić 1998, T. 26: 425-444). The bowl with an inverted rim and a wart (Pl. 2: 9) is quite indicative of the Early Iron Age (Ha B-C) (e.g. in Ormož: Lamut 1989, T. 11: 13; T. 25: 15), even if the warts are otherwise very typical for the Middle Bronze Age in Istria and elsewhere (e.g. Monkodonja: Buršić-Matijašić 1998, T. 48 - T. 51).

A fragment decorated with a (wavy?) rib (Pl. 2: 8) has a very high ratio of mica/quartz in the fabric, and can be compared to Sermin (Svetličič 1997, 47, T. 40: 1) and Kaštelir near Brtonigla (Sakara-Sučević 2004, 183: no. 466-471). M. Sakara-Sučević has found many parallels for this ornament in the period between the eleventh and eighth century BC (Sakara-Sučević 2004, 74-75). However, a wider dating range, well into the Iron Age, should be considered in our case because of the absence of stratigraphic data.
Several pieces can be dated with certainty to the developed Iron Age by a characteristic red slip coating and slow wheel production technique. The wheel thrown fragment Pl. 3: 1 has very good analogies in the Italian Iron Age, for instance in Gradisca di Spilimbergo (Pordenone), phase 3 (sixth to fifth century BC) (Cassola-Guida and Balista 1992, 9, fig 3: 13). Although massive, the everted rim fragment Pl. 3: 2 belonged to a more carefully crafted vessel as its surface is smoothly finished and covered with red slip or paint. Analogies for the piece can be found in Italy from the same period (Vitri et al. 1992, 30, fig 16: 3; 31, fig 17: 19, 21). Similar types can be found among the Nesactium finds as well (Mihovilić 2001, T. 114: 1).

Probably to be dated to the developed or late Iron Age is the very coarse, locally made mica/quartz-tempered pottery, which may also be contemporaneous with the imported late Hellenistic (Republican) ware. Of very characteristic type is the broad, shallow, and very massive plate made of crude fabric and sometimes decorated by twig impressions on the rim (Pl. 3: 3, 5, 6). A very similar plate with the same style of decoration is sorted into the so-called Timavo pottery by B. Lonza (1977, 111, T. X: 5). These plates were found in large amounts at Nesactium (Mihovilić 2001, T. 102: 4, 5, 7), but like other finds from this site lack stratigraphic or any other data on the original context. A large fragment of a big pot with a strongly everted rim from the Markovac I hillfort (Pl. 1: 6) can also be dated to the developed to late Iron Age, as it has some traces of slow wheel manufacture technique.

Figure 65 Amphorae fragments, Sv. Petar.

Late Hellenistic/Republican pottery can be divided into amphorae (Figure 65) and average to fine tableware, as can be expected in the case of imported ware (Pl. 4). A very good analogy to this pottery is offered by Sermin in Koper Bay. Amphorae from this site can be dated into the period between the late third and the first half of the first century BC (younger types of Greco-Italic amphorae, including Lamboglia 2 type) (Horvat 1997, 57-58). Good parallels are also the cargo of sunken ships from Pernat II on the island of Cres and the Sorinja promontory on the island of Rab, dated to the second century BC (Orlić, 2005). A larger quantity of amphorae fragments typologically similar to the Sv. Petar assemblage
has also been found at Kaštelir near Brtonigla (Šakara-Sučević 2004, 104, 191: 550-553; mostly Lamboglia 2 type). Amphorae lids (Pl. 4: 4) can be found at Sermin as well (Horvat 1997, 77-82). The rest of the finds belongs to the dark-slipped ware from approximately the same dating range (Pl. 4) (Stokin 1992, 84; Stokin 1990). The earliest appearance of this ware at Nesactium is in the period from the mid-third to the beginning of the second century BC (ibid.). An assemblage very similar to Sv. Petar was recovered at Fornače (Piran), consisting of Greco-Italic amphorae and a range of dark-slipped ware vessels. The site has been dated to the first century BC (Stokin 1992).

Finally, because of resemblance of early medieval pottery fabric to the late Iron Age one, we have been able to distinguish only a couple of possible Late Roman/Medieval pieces. The lid with a conical handle, such as the one on Pl. 4: 7, is frequent in late Roman/early medieval layers in Umag (unpublished, c.f. Bolšec-Ferri 2006; Čučković 2009).

The collected pottery has no stratigraphic context and cannot be dated with precision. Still, it does shed some light on crucial question of continuity of Sv. Petar. The analysed pieces cover the span from the Early to Middle Bronze Age until the end of the Iron Age. Considering the amount of the cultural layer, the size of the ramparts, as well as the existence of a probably related Bronze Age necropolis on Crveni Vrh, it seems reasonable enough to suppose a continuous development. This, however, should not exclude the possibilities of shorter abandonment or contraction, which cannot be identified without a detailed excavation. Similar to Sermin and particularly Kaštelir near Brtonigla, it seems that the site survived or even prospered after the fall of the supposed Histrian kingdom (or chiefdom) in 177 BC (Šakara-Sučević 2004, 104; Starac 1999, 8).

**Pottery Fabrics**

The distinction between typical coarse lithic-tempered pottery and that without visible temper is a crucial one in the consideration of the Umag survey data, especially in the case of the ploughsoil assemblages. Because of the very poor preservation of the finds, the fabric is generally the only indicator for the dating of the surface pottery fragments. The idea that the two fabrics may have chronological significance has come from the observations on the finds from Sv. Petar and Kaštelir, where the earlier types coincide with what we have termed grog-tempered ware, even if the temper is in most cases hardly distinguishable, as well as from the excavations in medieval Umag led by the author in 2007-08. There a layer with a quantity of very fragmented prehistoric pottery of predominantly grog-tempered fabric was also recorded. However, no diagnostic pieces were found and the layer was apparently disturbed in the Roman period (Čučković 2009). B. Bačić has sorted out several prehistoric wares from the Cingarela cave layers, but the problem is his suspicion of the disturbance of stratigraphy. It seems that the issue is in fact that of a
discrepancy between the obtained pottery sequence and the one expected at the time, so a revision of the assemblage would be necessary (Bačić 1956, 340). His type F ware, termed “early castellieri ware”, burnished, with clean but otherwise rough fabric, and in a range of dark red tones on the surfaces and dark core, would correspond to our grog fabric. Type G, termed “later castellieri ware”, is recognisable by a large quantity of mica or flint in the temper. In the wider context of Istrian pottery production, B. Čović considers several distinctive wares. In the initial Bronze Age (Istra I), when the local Eneolithic culture shows gradual transformation, a new fabric appears, characterised by “crushed stone temper” (Čović 1983, 121). This perhaps refers to the crude limestone particles, used since the Neolithic and characteristic for Eneolithic ware (Forenbaher and Kaiser 2006, 185). In the Istra II phase a radical change took place: the massive establishing of the castellieri, and, among other things, the appearance of a new pottery fabric, “without any temper, thick-walled, badly fired, coloured in tones of red and porous”, with good analogies in Dalmatia and western Herzegovina (Čović 1983, 124). In reality, pottery cannot be produced successfully without temper, and Fornebaher and Kaiser have already identified the introduction of grog temper, along with the burnishing of the surface, as a distinctive characteristic of the Middle Bronze Age ware in Pupičina cave (Forenbaher and Kaiser 2006, 191). Therefore we have chosen to term comparable ware as grog-tempered, even if this temper is hard to distinguish without some experience. We have also observed that organic temper usually accompanies or even predominates over the grog. What has to be pointed out is that grog-tempered ware usually appears together with other technological traditions, reaching only up to 35% in one horizon in Pupičina cave (ibid.).

9.2.3 Field scatters – prehistory

Systematic ploughsoil survey revealed mostly Roman sites, several prehistoric ones, while very few medieval or later scatters could be considered as traces of intensive past activity. Only one prehistoric scatter can be viewed as a possible settlement (Vilanija 5), while the rest are difficult to interpret more accurately, probably because of the very strong impact of agricultural destruction. The Vilanija 5 site is a 20 x 30 m large scatter of fired clay, weathered prehistoric pottery fragments, and some cracked stone that seems to have been subjected to burning (Figure 66). As observed on other similar sites, fired clay pieces were more densely distributed, allowing the approximate tracing of their distribution area, which also

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34 The Copper and Early Bronze Age are not well represented in the stratigraphic record (Miracle and Forenbaher 2006, 92)

35 Fabric-based typo-chronology of castellieri pottery has also been proposed by G. Stacul and N. Moretti. We have not been able to consult the original publication but only the excerpt in the work of Karouškova-Soper. It seems that our grog-tempered ware would correspond to their type D, dated to the middle of the second millenium BC. The lithic-tempered pottery appears at the end of the second millenium BC (type C). The Iron Age pottery would correspond to type A: crude, poorly finished ware, with abundant lithic inclusions. However, the temper is related as limestone, of which we are suspicious (Karouškova-Soper 1983, 226-230). In another article, Moretti describes type D as having crushed limestone in temper (Moretti 1978, 13).
corresponded to the pattern of stone pieces. Pottery, on the other hand, was spread on a wider area and could not be traced as a discrete surface distribution. Another probable prehistoric site is located in the vicinity of Seget, where a single sherd of pottery was found 200 m north of a dense concentration of fired clay. A few tiny fragments of prehistoric fabric have also been found in a “watching brief” in the Seget stanzia in 2007 (Čučković 2008a).

An interesting situation is a number of isolated fragments of pottery recorded around Špinel (Figure 67). As already discussed, the fine-grained data available for this sector is a consequence of the improved fieldwork technique in the 2008 season. Usually one or two small pieces were spotted per transect, but no discrete concentrations were visible on the field. When looking at the mapped data it seems that some loose correspondence exists between the essentially undatable fired clay fragments and the prehistoric pottery fragments. At the present state of research it is not possible to argue that fired clay might actually be an indicator of prehistoric activities, but at least it can be said that prehistoric sites defined by pottery finds are more often than not accompanied with fired clay concentrations. Dense areas such as Špinel 11 and 13 can safely be considered as prehistoric sites, but any division between site and off-site with the presently available data is essentially arbitrary.

The dating of prehistoric ploughsoil finds from Umag survey also poses a major problem. No diagnostic, or in any way chronologically sensitive sherds have been retrieved. Most fragments are tiny and heavily weathered. However, the vast majority of pieces are made of a fabric that is coarse and homogenous, sometimes with visible grog or organic particles in the temper. It thus seems that the ploughsoil sherds predominantly date from a period that is in Istria already known as rich in archaeological remains – the Early to Middle Bronze Age (see p. 151). The possibility of the differential survival of prehistoric fabrics should be ruled out because the ploughsoil scatter under Sv. Petar exhibits a marked diversity of fabric types with no apparent deterioration differences.
Figure 66 Overlapping field scatters: Vilanija 5, prehistory (above), and Vilanija 4, Roman (below).
A very curious and inexplicable phenomenon is the spatial coincidence of prehistoric and Roman sites, notably Špinel 11 and 13, Jeci 3, and Vilanija 5 (Figure 66). In the Metaponto survey, the suggested explanation for a similar situation was the enhanced scrutiny during the research of younger sites. Eventually, prehistoric finds would start to emerge on these spots, regardless of the real distribution of sites (Thompson 2004, 72) see Ch. 5.3.2). In our case this effect may account for the find of a single prehistoric sherd at Jeci 3, but not for the Špinel sector, where the uniform technique was applied over the entire area in 15 metre systematic transect collection. Favourable topographic setting may also be the cause in the case of Špinel 11a and 11b, and perhaps Jeci 3, which occupy isolated, low elevations. The only remaining explanation would be a mistake in finds classification, and that a major one! If these finds are actually coarse, handmade, local Roman pottery, then most of the prehistoric finds from the survey should be ruled out. To counter this devastating proposition, we point out to a slight spatial discrepancy between the Roman and the presumed prehistoric artefacts, visible for instance in the case of the Vilanija 4 and 5 sites (Figure 66). We have also gathered some experience with prehistoric and Roman pottery fabrics in the course of several years of fieldwork in the Umag Museum. While late Iron Age, medieval,
and especially post-medieval pottery can be confused with Roman ware, the specific soft, grog-tempered fabric is indeed easily distinguishable. At the same time, the same fabric does not appear in any significant quantity in the Roman layers that we have excavated in the Umag area, nor on the majority of ploughsoil sites.

9.2.4 Dolina sites

As mentioned before, special attention was paid to karstic landscape, in the first place to the dolinas that are still used for agriculture. These hold a crucial place in the anthropization processes in the karst and have recently been reported as foci of past activities (Novaković, Simoni and Mušič 2000; Šuta and Katavić 2003). However, not before 2004 has “the first Bronze Age dolina site” been reported in Croatian Istria, and that one in the Umag area, on the plateau of Markocija. Prehistoric pottery fragments were found in trenches dug for the purposes of the golf course construction at the depth of 60 to 100 cm (Mihovilić, Bradara and Komšo 2004, 71). A handful of prehistoric pottery fragments was also gathered by the Croatian Conservation Institute in the Valkadin dolina, 500 metres west of the Francanoža dolina underneath Sv. Petar, during a construction surveillance. No features or distinctive layers were visible (Percan 2009, 324).
The Umag survey recovered pottery fragments of the usual coarse, prehistoric fabric from several shallow dolinas, typically accompanied with a scatter of crushed fired clay. For instance, the assemblage form the dolina in the vicinity of Kaštelir is predominantly composed of fired clay, some smaller stone, and a very small amount of tiny, undiagnostic pottery fragments (Figure 68). The fabric of the pottery can be classified into the Bronze Age grog-tempered production. The pottery forms a maximum 10% of the finds assemblage. This has been assessed “by eye” during the survey as pottery was not distinguished from the fired clay during field survey recording. The dolina adjacent to the rampart of Kolumbanija has an extraordinary concentration of fired clay but not a single pottery fragment has been spotted during field survey.

It seems that the scatters tend to concentrate on one side of the dolinas, but that cannot be proven given the quality of data obtained. A similar pattern has been recorded by Komšo and Ćuka at Perci, where finds were spotted on the dolina edge and the adjacent slope. However, the dating of the finds is not specified (Komšo and Ćuka 2008, 279). We have not recovered diagnostic pieces of pottery in dolinas during the Umag survey, but the fabric is identical to the other ploughsoil sites so the same dating range should be appropriate (Istra II-III periods). In fact the difference between dolina sites and those on open terrain rests solely on the topographic setting (no significant difference in cultural material has been observed), and may thus be completely etic.

9.2.5 Cairns

![Figure 69](image-link) Cairn in the vicinity of Kolumbanija.
12-18 m large stone cairns were recorded in the vicinity of Kolumbanija, Kaštelir, and Markovac. Only stones of all sizes were observed in their construction, in contrast to the tumuli, which are usually covered with mixed stone and soil fill. This may indicate a different construction technique, rather than the effect of denudation. In all cases they are situated on isolated ridges or hilltops that can be easily seen from the nearby hillfort. On the Markovac III site one cairn has been found while Marchesetti reports two big tumuli on what is most likely the same location. The other tumulus was probably destroyed by the stone quarry that has removed exactly one half of the hill. Marchesetti’s report is very valuable because it seems that the twin cairn is a recurring pattern; it applies to both cases of its occurrence in the vicinity of Kolumbanija and Kaštelir. The Markovac III site has also been visited by the Pula Archaeological Museum team on the occasion of the reconnaissance survey prior to highway construction. They saw “more tumuli” and in one that had been partly destroyed a circular construction was visible (Komšo and Čuka 2009, 336). This probably refers to a large heap of the bulldozed material stretching along the edge of the Plovanija quarry, which may, indeed, hide the remains of a destroyed tumulus.

9.3 The Bronze and Iron Age landscape: discussion

9.3.1 Hillforts

A detailed examination of the hillfort sites revealed many fine details that complicate the previously listed assumptions (Ch. 9.1.1). First of all, no two hillforts are alike, not only in their formal characteristics (size, shape, etc.), but also in building techniques and chronology. In some cases the hillfort layout seems to have developed over time by extending the enclosed area, for example at Kaštelir and Sv. Petar. However, single-rampart sites like Kolumbanija and Glavica in Markocija may have been constructed in one brief period and only slightly modified during subsequent use. Markovac I has shrunk in occupied surface over time and was probably abandoned for a certain period, or at least the mode of occupation changed radically. A surprising case is Kaštelir, a relatively large settlement with massive ramparts and signs of successive enlargement, but, if our interpretation is correct, abandoned at an early date, in the Istra III period or even earlier.

Accounting for the marked differences in their landscape setting and layouts, it is clear that hillforts are a very heterogeneous and complex group of sites. B. Slapšak, for instance, considers several factors in his typo-functional classification. Hillforts with the enclosed area close to the average of 1.2 ha, with good local availability of arable soil and good visibility over the surrounding area, often superseded by a

36 “Altri due tumoli minori sorgono sopra una vetta ad oriente al di là della strada erariale” (Marchesetti 1903, 77).
modern settlement, are labelled as group A and considered as being permanently settled and playing a pivotal role in local settlement. Group B hillforts are somewhat smaller, sometimes positioned in flat areas between dolinas or on slopes, and surrounded by soils that are mostly good for pasture. Finds are sparse and fortifications are weaker than in group A. Group B settlements may correspond to smaller individual or specialised economic units, probably for herding purposes. Small hillforts, around 0.4 ha in surface, placed at higher altitudes and without visible preference for arable soil types, are classified into group C. This group cannot be interpreted in terms of function, but defensibility may have been a key feature. Finally, group D comprises very small sites placed on prominent hilltops with a wide view, which may have served as watch-posts (Slapšak 1995, 26-27).

Even if Slapšak’s classification, developed for the Kras area, cannot be applied directly to the Bujština region, a basic distinction between large sites with traces of permanent settlement (e.g. Sv. Petar) and those that in every respect seem inconvenient for setting up habitats (Markovac I, Kolumbanija) has to be made. The problem is that our sample is too small and we are unable to provide a classification scheme better-suited for the studied hillforts. It is certain, however, that the surface of the enclosed area is not a good parameter in this respect, as already acknowledged by V. Karouškova-Soper (1983, 85). Markovac I, for instance, has one of the largest surfaces of the surveyed hillforts (2.8 ha), but is at the same time placed in the most inhospitable setting of all western Bujština hillforts. V. Karoškova-Soper has instead considered the surface of the flat, terraced terrain inside the hillfort as a more informative clue to the possible settlement size (ibid.). However, in the cases of hillforts lying on less pronounced terrain, e.g. Kaštelir and Glavica, most of the interior area is flat but still cannot be considered as densely settled only because of that reason. Another indicator of the intensity of settlement is the amount of accumulated sediment. For instance, Š. Batović has classified Liburnian hillforts according to the presence or absence of a substantial “cultural layer” (Batović 1977: as quoted in Glogović 1989, 3). The volume of the sediment may indeed be the best clue to the intensity of settlement, if backed by the dating range of artefacts. Sv. Petar, which is rather small in surface, has by far the largest amount of sediment accumulated behind 6-7 m high ramparts, while Markovac I in its lower (older) parts has no sediment whatsoever.

Another important distinguishing factor is the availability of arable or otherwise productive land within the site catchment. Here the sites on the barren karst stand out – Kolumbanija and Markovac I. It is hard to see any advantage, except a strategic one, for their setting. They stand on very prominent highpoints and have ideal visibility over Piran Bay and the Dragonja estuary. The pastoral function of this type of hillfort, as stressed by Slapšak, may be suited to Kolumbanija, which has two openings at different sides, a feature that may point to herding activities (Hamilton and Manley 2001, 13). One
problem that should be pointed out is the evidence of post-abandonment use of the sites for herding. This has been noted chiefly for Markovac I, but may apply to any other hillfort. While such activities indeed indicate that herding may have been practicable, at the same time they may have altered or accentuated some features of the hillforts (walls, entrances, etc.) to be more suitable for husbandry than they originally were.

Larger hillforts with substantial remains of pottery or wattle and daub structures, and close to arable land, clearly fall into the group of permanent settlements that have served as a focal point in the local area (Sv. Petar, perhaps also Kaštelir and Markovac II). This said, it is still not clear what their relationship with that local area was. More extensively excavated hillforts such as Monkodonja, Vrčin, or Nesactium, which show dense and continuous settlement in the long term, as well as some social differentiation and accumulation of wealth (Hänsel et al. 2009; Mihovilić 2001; Buršić-Matijašić 1989), may belong to a group of regional centres and offer an image that is probably not appropriate for the majority of “middle-class” hillforts. In any case, what emerges throughout the Umag Field Survey data is the importance of the scattered pattern of semi-permanent or permanent settlement surrounding the large sites, which will be considered in some detail below.

**Hillfort surroundings**

An important, although not very surprising discovery are field scatters in the immediate vicinity of hillfort sites. These include a set of findspots on the Markocija plateau, sparse finds around Kaštelir, and one large concentration adjacent to Sv. Petar, as well as finds from a tiny nearby dolina (cf. supra). As most of the hillforts lie on rocky terrain, the scatters were in most cases brought to surface by chance destructions and therefore could not be consistently recorded. At none of the find spots a clearly visible archaeological layer was found, but rather thin humus matrix containing sparse pieces of pottery. The large dolina site beneath Sv. Petar is an exception.

The scatters around the hillforts provide a wider context for discerning patterns of hillfort layout development. Rampart enlargements seem to adapt to an already existing settlement in the adjacent area, rather than to be planned from the inside, that is, to accommodate only the needs of the inhabitants from the enclosed space. A good example is the construction of the lower course of the rampart of Sv. Petar, which should be understood in relation to a settlement or activity zone recorded in the adjacent dolina. It is situated in the most impractical place in terms of topography if the extension of the settlement zone had been the only aim (Figures 52 and 53). The horizontal area gained is today only up to 10-12 m wide and could not have been much larger originally. In fact, due to a pronounced slope, the communication between the upper and lower parts of the hillfort would be far more difficult than between the under-
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hillfort area and the enclosed low-laying appendix. The same applies to Kaštelir, where the second rampart also straddles a somewhat steeper slope in the direction of an agriculturally attractive plain (Figure 44, p. 121). However, different histories of hillfort development have also been documented in Istria. B. Bačić has established that the inner rampart of the Kunci hillfort is constructed on an archaeological layer of considerable thickness, implying that the fortification developed later in the interior of the enclosed space (Bačić 1970, 22). Something like that may also apply to Markovac I, where we have established that the upper ramparts belong to a younger phase.

Sites from areas adjacent to large Iron Age hillforts like Pula, Sermin, and Stramare are not the best analogy for the discussed sites as these are already protourban settlements with a marked orientation towards crafts and commerce (Mihovilić 2001a; Horvat 1997a; Poglajen 2007, 48). In the case of western Bujština, the Bronze Age seems to be the period when much of the archaeological record around hillforts was formed, even at the foothill of Sv. Petar, which has ample evidence from the Iron Age as well (Ch. 9.2.2). Perhaps a more appropriate model would be one of scattered settlement, in which the choice of habitat location was a compromise between the proximity of the economic area and the safety of hillfort. One possible consequence of such a scenario would be that the hillfort assumed an empty or even a marginal focal point of the adjacent settled area, as my have been the case with Glavica on Markocija, which features a rather weak rampart when compared with Kaštelir or other similar sites.

9.3.2 Monuments

Single and multiple stone cairns, the only type of specific prehistoric monument recorded, show a very distinctive relationship with the hillforts and, we believe, signal a complex symbolic relationship between the hillforts, which function as the focal points of social life, open-air settlements, and the topography of the landscape. In the first place, the largest cairns occupy the highest points of the Markovac I and Glavica (Markocija) hillforts. Markovac II is not reliable because of recent modifications. At present we are not able to assess the chronological relationship between the cairns and the hillfort ramparts, but what is clear is that the both are placed on high spots, actually the highest points of the entire landscape. Therefore, it does not seem that the function of the cairns should be understood purely in the context of defensive structures. The layout of Glavica, with well preserved earthworks around the cairn, as well as the disconnection of the hillfort rampart from the cairn, indicates either a subsequent erection of the cairn or very slight use of the hillfort, perhaps even some respect for the structure. Markovac has a younger, Iron Age phase, and the cairn has apparently been preserved, but it is impossible to assess its relation to the earlier, Bronze Age phase.
Large mounds, sometimes proven to contain Bronze Age burials, have been recorded in many places in Istria (Codacci-Terlević 2004). The mound on Veli Majan was 15 m high and measured 40 m in diameter (idem, 45). One of the most impressive mounds preserved is on the top of Maškerada, encircled by multiple concentric embankments and remains of drystone walls, which may provide an analogy for the Glavica case (Buršić-Matijašić 2007, 223-5). Maškerada has been dated broadly into the Bronze Age (ibid.). Excavations of a large cairn on Maklavun hill have revealed mortuary structures with multiple interments (Codacci-Terlević 2004, 50-51). It is problematic, however, whether large, hilltop cairns should normally be considered as remnants of burial ritual before more data is available (Novaković 2001, 224). For instance, in Ostri Vrh pri Štanjelu (Brniška dolina, on the northeastern border of the Slovenian Kras region) the excavation of one typical hilltop cairn revealed a peculiar, thick-walled, oval building, interpreted by the excavators as a surveillance tower. Radiocarbon dates indicate Iron Age dating (sixth to fifth century BC) (Turk and Jareb 2006). B. Lonza has excavated a large mound on the Markovac (Koper) hillfort and found extensive settlement debris in its layers (Lonza 1977a). He proposed the existence of a house (capanna) on top of the structure, while in the deeper sections a layer of larger stone was visible (the stone core of the mound). Unfortunately, the data provided by the excavator are too scarce to enable any reconsideration. We are not informed of any graves, so that his label “tumulus” should be understood only in general terms. Details of stratigraphy and possible structures are also lacking, as well as an analysis of the finds. It seems to us that some finds from the “house” on the top of the mound may date from the Late Bronze to Iron Age (Lonza 1977a, fig. 3: 1, 9, 10; fig. 4: 5, 6). However, his conclusion that the mound precedes and has been subsequently incorporated into the hillfort layout seems plausible (idem, 137). P. Novaković is of similar opinion in the case of the Iron Age Graček hillfort with a cairn, near Famlje (Novaković 2001, 225). In any case, when considering that both the hillfort and the mound are of Bronze Age dating, as we suppose in the cases of Markovac and Glavica, no secure analogy can be sorted out.

Large hilltop cairns have been constructed to be looked at from a distance, and apparently signal a certain communal message. Traditionally, this has been regarded as related to territorial claims, perhaps in the context of ancestor worship (Novaković 2001, 231ss), a ritual practice recorded at Monkodonja hillfort as well (Hänsel et al. 2009, 94). In order to assess the impact of these structures on the cultural landscape of past societies we have conducted a simple visibility analysis for the Markovac I and Glavica hilltops. Several problems of the applied method should be mentioned before observing the result. The terrain of Bujština must have been much more wooded than today, which cannot be accounted for in the terrain model. Trees may have radically changed the visibility. The Shuttle Radar Topography Mission...
digital elevation model was used, with a nominal resolution of 90 metres.\textsuperscript{37} This is a very coarse DEM but, we believe, sufficient for large-scale viewshed analysis. Finally, Markovac I and II may have formed a twin hillfort but we have chosen to analyse only the northern peak because the other one has been severely altered in the recent period and its dating is not precise enough to establish contemporaneity (for a consideration of application of visibility analysis: Rajalla 2004).

In both cases the result of the visibility analysis shows good coverage of wide areas, 6-7 km in diameter. Finer details of the coverage should be ignored because of the problems listed above. In this context the size of the mounds erected on the hilltops becomes more understandable; they were designed to be visible from far away.

A visibility study of large hilltop Bronze Age cairns in the Kras region in Slovenia has already been conducted by P. Novaković, who considers the monuments in the context of territorial demarcation. He stresses the coincidence of the locations of the mounds with the borders of local lithological units, as well as some larger-scale geographical regions. It seems, in fact, that the mounds can even be used in reconstructing past political borders (Novaković 2001, 227-233). The study area of western Bujština is too small for such an approach, but it is also less populated with large hilltop mounds and it remains to be seen whether the Kras model suits our region as well.

\textsuperscript{37} The resolution of the SRTM data is 3 arc seconds (outside the USA), which in the Mediterranean latitude corresponds to an approximately 70 x 90 m cell in the UTM grid (http://www2.jpl.nasa.gov/srtm/). Thus the apparent DEM resolution is 66.8 m per cell in the study area of western Bujština.
Figure 70 Visibility analysis (Glavica-Markocija: left, Markovac: right). The altitude of the observer is 3 meters above ground.
A monument type previously unknown in Istria is the twin cairn which appears in the vicinity of Kolumbanija, Kaštelir, and probably Markovac. We have found no reference to a similar type of feature in the surrounding regions. The precise chronology of the twin cairns is impossible to determine at present as no finds have been collected, and the cairns are also detached from any datable feature. At the moment, the only clue is their proximity to the Bronze Age hillforts, and what may also seem significant is the setting of the twin cairns on high points in the vicinity of the hillfort settlements. However, the complex history of Kaštelir, as well as the problems in relating the large hilltop cairns to the hillforts, do

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38 A unique monument has been recorded by P. Oreč in Herzegovina, comprising two stone cairns connected with a semi-circular embankment. However, the only find collected can be dated into the fourth century BC, and the site is also in the proximity of a probable tumulus necropolis (Oreč 1987, 193-195).
not allow us to assume a direct contemporaneity between the two. The only thing that seems reasonable to assume is the symbolic reference of the features to hillfort settlements: even if and when they were abandoned, they still retained some symbolic value, as was the case with Kaštelir. Twin symbolism is a curious aspect of the Bronze Age, but we shall not enter that discussion here (cf. Kristiansen 2005, 264 ff). In the context of understanding the Bujština landscape, it is important to observe the topographic analogy of tumuli necropoles, especially Glavica on Crveni Vrh, and double tumuli. They seem to be placed in an analogous topographic setting, clearly set against the world of the living (“the other side”). Furthermore, the largest tumuli at Glavica are positioned on the spot directly opposite from the hillfort, one after the another, just as the twin cairns.

9.3.3 Necropoles

Three necropoles of tumuli discovered in the course of the survey have very different landscape settings. The Crveni Vrh necropolis is the largest and covers a large part of the slope of a barren, dominant hilltop, presumably of low agricultural importance. We have already pointed out that the largest tumuli face the Sv. Petar hillfort. The rest of the necropolis, however, opens up to the wide landscape to the south and is not visible from either the Sv. Petar, or the Barafito hillforts. The Kaštelir necropolis is a completely different case. It reuses a previous settlement and we have not identified whether it is related to another hillfort site nearby. Finally, in the case of Markocija, the presumed necropolis is placed in what we have termed a sub-hillfort zone, in a very accessible and probably agro-pastorally exploited plateau. It is not possible to assess whether this implies a chronological differentiation of the necropolis and the hillfort as in the case of Kaštelir.

In none of the examined cases does the “classical” model of the necropolis directly linked to the contemporary settlement, as considered in the case of Monkodonja and Mušego, seem appropriate (Hänsel et al. 2009, 92). The layout of the Crveni Vrh necropolis is ambiguous, and in order to have a better idea of its possible role in the cultural landscape we have made a visibility analysis form several points that encircle the recorded area of the site. It has to be stressed that the western limit of the necropolis is unknown, so that it was probably visible from tmost of the Valfontane dolina under the Barafito hillfort. Nevertheless, the wide panorama opening to the south points to a zone between three hillfort settlements. This may indicate the intensity of human presence in the area to which the mortuary site has communicated a symbolic message. In such a scenario we can find a possible explanation of the clear hilltop: it may simply have been avoided because of bad visibility rather than some symbolic or ritual value. Comparable visibility studies have not been made for the Bronze Age necropoles in Istria so far, but from the published data great diversity should be expected. Apart form the mentioned en-face
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hillfort model, as in Monkodonja, necropoles also appear at isolated hilltops, on slopes, or overlooking the seashore, as in Marić Bay (Barbariga) (Codacci-Terlević 2004).

Figure 72 Visibility analysis of the Crveni Vrh necropolis (observer’s height is set to one metre).

9.3.4 Ploughsoil scatters

Until recently, no small, open-air sites dating to the castellieri period have been published and very rarely an occasional note can be found (e.g. Šonje 1966, 307ss, Bekić 1996, 45). The strong focus on the research on big sites (hillforts and necropoles) has only further enhanced the image of walled-up, isolated communities inhabiting the Istrian hilltops. Within the last five or six years, with the advent of the politics of a more systematic application of rescue excavations, as well as of more detailed survey techniques, the situation has changed radically (Mihovilić 2009). In 2004 “the first Bronze Age dolina site” was documented in Croatian Istria (Mihovilić, Bradara and Komšo 2004: see here on p. 156), and in 2007 the Croatian Conservation Institute team excavated a number of small open-air Bronze Age sites on the corridor of a new gas pipeline between Pula and Rijeka (Bekić (ed.) 2007). There is also a number of reports of similar finds, dating typically to the Bronze Age and sometimes the Neolithic or Mesolithic, appearing in the accounts of the Pula Archaeological Museum fieldwork (e.g. Komšo and Čuka 2008; idem. 2009).

The only small open-air site that has been analysed in some detail is Guran (Vodnjan), where a prehistoric layer was found in the course of the research on a medieval church and settlement. In the
ceramic assemblage K. Mihovilić sorted out some pieces typical for the Late Eneolithic/Early Bronze Age in Dalmatia, and the Cetina culture in particular, while some similarities with the Danube traditions are also visible (Mihovilić 2009, 43-46). Overall the site can safely be attributed to the Istra II phase according to Čović, that is BrA2-B1, perhaps with some latitude into the earlier, transitional period (ibid.). The recurring Early to Middle Bronze dating, easily inferred from the soft, organic, and grog-tempered pottery is indeed curious. Besides Guran, such pottery ware was found in Krvavići-Boškina (Marčana) (Percan 2007), and possibly on other sites that have not been researched yet (e.g. Perci near Tar: Komšo and Čuka 2008). This places the Umag finds into a wider perspective and lends some support to the proposed typical Bronze Age dating for the larger part of prehistoric ploughsoil finds.

The interpretation of open-air finds has already been offered by K. Mihovilić (2009 47-48). She points to an analogy with the Posušje culture of western Herzegovina, where so-called “out-of-hillfort settlements” have been known for some time (Čović 1983, 143-145). These sites existed parallel with hillforts and have been further divided by B. Čović into two groups, nucleated and dispersed. Very scant evidence on either is available, but some features correspond well with Istrian sites: for instance, small quantities of pottery and considerable fired clay concentrations, as well as the positioning on a mild slope or flat terrain. The dispersed type is exemplified by the site of Slime near the village of Osoje (Posušje), where isolated find scatters, 100-150 m apart, stretch over 2 km. Again, pottery is sparse in contrast to the fired clay concentrations. While some of these sites cover several hundred square metres, the rest are much smaller and B. Čović supposes the existence isolated individual houses. The pottery from the Posušje open-air settlements can mostly be dated to the Early Bronze Age, while a few finds extend the time span into the late Eneolithic as well (ibid.). In sum, the Herzegovina region presents a remarkably suitable analogy for the Istrian open-air Bronze Age sites, both in the dating and in some general characteristics of the surface assemblage.

Should we, then, understand the evidence from the Umag plain as small open-air settlements of varying size and degree of dispersion? In the case of discernible finds concentrations, like on sites Špinel 11b and 13, or Vilanića 5, this would seem as a plausible explanation. However, sparse finds scattered all over the landscape in the Špinel area, along with some finds at Vilanića, do not offer any clue for interpretation. The off-site manuring hypothesis, considered by Novaković et al. in the case of dolina sites in the Slovenian Karst, is not regarded as plausible by some practitioners of field survey because of the poor survival rates of such finds (Bintliff 2000, 214, note 3, Kuna 2000, 33). To these authors it seems more likely that prehistoric pottery finds emerge from buried subsurface deposits during seasonal soil tillage (ibid.). On the other hand, manuring with domestic waste is well-attested in Western Europe since the Late Neolithic period, and sparse artefact fragments have been found in the ard-marks on Bronze Age
fields in the Netherlands (Bakels 1997). The quality of the data from the Umag survey does not permit entering into this discussion at the moment. The only thing certain is that the space surrounding the Kaštelir hillfort was intensively used. It should be borne in mind that the distance of the Špinel area from the hillfort is less than a thirty-minute walk, and much less from the sub-hillfort zone in Ungarija. In any case, then, this was the immediate economic zone of the larger settlement complex.

9.3.5 Dolinas

Prehistoric activity in the karstic dolinas in the area of Dinaric karst has emerged as an interesting topic in last two decades. The available data, however, are still very scarce. One of the first and still the most comprehensive study comes from Otišić-Vlake (Cetina region), where A. Milošević and B. Govedarica identified a number of adjacent dolinas with Early Bronze Age material (late Ljubljana culture). In one of them traces of a habitat were unearthed (Milošević and Govedarica 1986). Very similar finds were obtained in two dolinas in Vučevica, in the hinterland of Kaštel (Dalmatia), where also an Eneolithic/Early Bronze Age settlement was uncovered, with some scant Neolithic finds in the underlying layers (Šuta and Katavić 2003). In 1995 the University of Ljubljana team surveyed nineteen dolinas in the “classical” karst of the Slovenian Kras. The landscape is characterised by the poverty of topsoil and long-term exploitation of the dolinas for agricultural purposes (Novaković, Simoni and Mušič 2000). The Kras region borders with Istria and has a comparable cultural development to the peninsula interior. Somewhat surprisingly, approximately one half of the collected material can be dated to the castellieri period, i.e. Bronze to Iron Age, while the rest is mostly composed of post-medieval and modern material. Roman and medieval finds are very badly represented, even if the settling of the Kras is well-attested in these periods (idem, 129). A number of new dolina sites has also come to light in the course of recent rescue excavations, but the results are usually published without in-depth assessments. In some dolinas in the Slovenian Kras a well-defined thin layer of dark brown soil containing very poorly preserved prehistoric pottery has been documented at a depth between the subsequent infill and what seems to be an archaeologically sterile, loamy substrate (Mihevc 2005). Comparable finds have also appeared on the route of the magistral pipeline at Kukuljanovo-Stepenci (Rijeka region). In one dolina two prehistoric layers were discovered and while the pottery has been typologically dated into the Early to Middle Bronze Age, a radiocarbon-dated sample from the bottom of the cultural layer has provided a date of 3740±35 CalBC (Višnjić 2007, 271-272).

One of the major issues of the dolinas’ prehistory is their occupation. Novaković et al. think that settlement in the precious pockets of arable land is “very unlikely”, which, indeed, would seem logical from the perspective of the long history of struggle for every patch of soil in the harsh karstic landscape.
Their hypothesis for the origin of prehistoric material is based on traditional practices of Karst inhabitants who would bring considerable amounts of rubble, stone, brick, or other hard material into the dolina in order to ameliorate the soil in terms of aeration and reduction of acidity (Novaković, Simoni and Mušić 2000, 126,133). This brings us to two problems regarding the specificities of western Bujština. The first is the issue of water retention, which has been noted on several occasions in Umag survey and has already been discussed in Ch. 6.2.1. The historical Karst practice of digging large trenches in the centre of dolinas and filling them in with stone and rubble, related by D. Radinja, most probably refers to the water drainage technique as well (Radinja 1987, 134; Novaković, Simoni and Mušić 2000, 126). Considering further the lesser depth of the lighter soil layers over the loamy, badly permeable substrate in the initial period of the dolina agriculture, we would point to a considerable problem in terms of the assessment of the agricultural potential of dolinas in prehistoric period. The agronomic cultures that have been frequently observed in the deeper Umag dolinas are those that complete the vegetation cycle before winter (e.g. corn). The most extensive historical use of dolinas in the Karst has coincided with the introduction of potato (Novaković, Simoni and Mušić 2000, 126). The second problem is the quantity of prehistoric pottery finds that is comparable to the peak of Karst settlement in the historic period (eighteenth to nineteenth century), in spite of the elapsed time. Finally, the only analogies that have been researched in some detail (Otišić-Vlake and Kaštela-Vučević) clearly show settlement traces. This, however, does not necessarily imply permanent, year-round habitation. The specific distribution of artefacts on the slopes and edges of dolina bottoms, as recorded in Perci (Komšo and Ćuka 2008), would also go against the manuring hypothesis.

Unfortunately, we have not been able to research the Markocija plateau before its destruction, but the amount of pottery that has appeared in the soil machined away from the dolina and spread as a substrate for the golf course seemed to be comparable to the finds from the Kras region. Other surface assemblages from the Umag area dolinas are similar to the finds form the open-air sites in Herzegovina in their high content of fired clay. We have already stressed that the fact that the gathered data do not show clear a difference between dolina assemblages and other open-air sites in the Umag area. As the western Bujština landscape is not as contrastive as the Kras or Dalmatia, where the formation of karst is much more evolved, it may be that some highly specific use of dolinas was not necessary, but this is only a hypothesis that cannot be verified at the moment. A very curious example is the Valkadin dolina near Sv. Petar, which has provided some Bronze Age pottery fragments in spite of being the most prone to flooding of all the dolinas that we are familiar with in the Umag area (see figure 21, p. 75) (Percan 2009, 324). Considering the stability of the local soil substrate (terra rossa) we suppose that this dolina was as wet in prehistory as today, and therefore not suitable for winter crops.
Based on the presented analogies and gathered evidence we would suggest that the western Bujština dolinas were foci of (intermittent?) occupation and may have been used as domestic compounds in a mixed type of economy that also included keeping animals. This model is based on the excavated specimens from Dalmatia and Herzegovina, dating from roughly the same period as the Umag dolina sites. Certainly, a diversity of uses should be expected, and many “tamed” dolinas must have been subjected to various types of more transient use, including manured agriculture. It still remains to be proven when or whether the soil coverage in the Bronze to Iron Age became degraded to such a degree that the use of dolinas became as vital as in the nineteenth century (see Ch. 6.6.1). In the Umag area this is definitely not the case, as areas of severely degraded karst appear only occasionally, and in some places, such as the Markocija plateau, some remains of post-medieval (or earlier?) agriculture on thin soils are still visible (cf. supra).

9.4 Conclusions

9.4.1 Patterning of the hillfort landscape

The spatial extent of the Umag survey does not allow for consideration of the settlement pattern on a scale that would be comparable to typical hillfort studies, such as the work of V. Karouškova-Soper (1983) and P. Novaković (2001). Moreover, the studied hillforts are so different from each other in terms of their layout, chronology, and topographical setting that any direct comparison (dealing with them as homogenous group) does not seem feasible.

The smaller scale, however, offers insights that are very interesting, if for not other reason than because of the dearth of such data for the Istrian region. Ploughsoil scatters correlate with the hillforts, especially in the case of Kaštelir (Figures 67, p. 155 and 73). Together with the data from sites in the vicinity of the hillforts, they seem to show quite clearly a hillfort-centred organisation. Taking a wider spatial perspective, a pattern of zoning emerges, which, it should be stressed straight away, has to be understood as specific to the few sites studied at the moment.

Immediately below or adjacent to the ramparts lies a sub-hillfort zone, which sometimes features fairly dense scatters of surface finds, as in the case of Sv. Petar. We have tried to argue that the elaboration of ramparts at Sv. Petar and Kaštelir is related to the immediate settled area and would seem to indicate a process of growth somewhat comparable to the enclosing of a suburbium. What is certain is that these elaborations are set against, rather than in accordance with, the local topography, and thus seem impractical in terms of ease of construction and movement inside the sites.
Further away lies a near-hillfort zone characterised by a scatter of small sites or an uninterpretable off-site carpet of surface finds that are focused on arable plots, either in karstic dolinas, or on the continuous plain as in Špinel. Even if surface remains are scant, the area on which they are spread may indicate substantial activity. Somewhat larger and denser scatters of prehistoric pottery and fired clay, which can be labelled as sites *proprio sensu*, seem to appear at some distance from the hillfort, for instance on the other side of the Potok stream, just under two kilometres from Kaštelir, or at the site of Vilanija, below the Markocija plateau. These may indicate a zone of “satellite” settlements: permanent or semi-permanent habitats that are still related or focused on the hillfort. In the case of the Kaštelir area, the Potok may present some sort of boundary (Figure 73).

![Figure 73](image)

**Figure 73** Complex spatial pattern of Bronze Age features in the Kaštelir environs.

Finally, isolated sites appear on the open Umag plain, apparently far from any hillfort, for instance Seget 2 and Jeci 3. Isolated small sites like Zvegar, which have emerged through unsystematic reconnaissance, can also be fitted into this group. The problem that has to be taken into account here is the difference in survey methodology between the 2007 and 2008 seasons, which at the same time
corresponds to the distance from major hillforts. In any case, the 2007 would have detected any substantial open-air Bronze Age settlements on the terra rossa plain in the areas of Seget and Petrovija. Therefore, we are inclined to see a landscape populated with small settlements or single habitats throughout the entire surveyed area, although a pattern of site distribution cannot be assessed on the basis of the gathered data.

9.4.2 A historical perspective

The diversity of forms and histories of Bronze and Iron Age sites recorded in the course of the Umag survey does not permit a general discussion of the hillfort landscape as a single phenomenon, as frequently encountered in the literature (e.g. Buršić-Matijašić 2007; Karouškova-Soper 1983). The idea of a more heterogeneous historical development has already been stressed by other authors too (Novaković 2005a, 307) but the data available usually allows a distinction between the early (Bronze Age) and the later (Iron Age) hillfort landscape at best. Therefore, accounts of the later prehistory in Istria and the surrounding regions inevitably slide into the traditional conception of stability and continuity, which is in fact an amalgam of incongruent data from two millennium-long periods (Bronze and Iron Age). The details of the Bronze Age landscape recovered in the Umag Field Survey present a far more dynamic image, where the traditional assumptions of stability and continuity have to be redefined. Even if we cannot embark upon piecing together the disparate parts of this almost two millennia old history here, the historical perspective offered by the Umag finds is, perhaps, the most valuable accomplishment of the survey for this period.

As already discussed, the clustering of dates for prehistoric finds in the Early to Middle Bronze Age period, particularly those from the open-air sites and ploughsoil assemblages, is a remarkable feature not only of the Umag survey, but of Istria in general. When taking into account the other types of sites from the period (hillforts, tumuli necropoles, cairns), a highly structured landscape emerges. This structure seems to have been focused on demarcating the space by, to use the term of Hamilton and Manley (2001, 31), monuments that are good for being “looked at”, such as tumuli and especially the large stone cairns. This would imply societies in need of focal points that are group-specific, with particular histories, probably often related to ancestor worship. This may be related to processes of colonisation and landscape taming (Novaković 2005a, 304), but in any case points to a society that is scattered across the landscape, possibly mobile to a certain degree, and segmented in its social structure. It is hard to imagine a strong political centrality of hillfort settlements in this perspective, and in many cases they may have had specific roles related to periodic or sporadic events.
In the eastern Adriatic, hillforts typically proliferate some time after the introduction of the tumulus burial and other features of the Bronze Age “package”, as for example in the Cetina culture which is otherwise related to the beginnings of the Istrian Bronze Age as well (Marović and Čović 1983, 201; Codacci-Terlević 2004; Mihovilić 2009). The hillfort phenomenon would, then, be a response to historical processes already under way, demanding security and social cohesion (Novaković 2005a, 303), and may be subsequent or at least parallel to the significant increase in the density of open-air settlement. The development of the cultural landscape during the Middle Bronze Age certainly points to a process of nucleation through the hillfort sites, which at that time began to be accommodated for burials between the ramparts, or in their immediate proximity (Čović 1983a, 236). This period has not been differentiated from the Early Bronze Age in the Umag survey data, but the probable abandonment of Kaštelir and perhaps also of Markovac I in the advanced Early or the Middle Bronze Age points to a non-linear or discontinuous development of the hillfort landscape. In other words, there seem to be marked fluctuations in the activity in the surveyed area, although the problem remains how to relate detectable traces of past activity (pottery scatters, hillforts, and monuments) to settlement intensity.

Only in the Iron Age does the evidence for a possible local centre appear in the Sv. Petar hillfort. The site has fairly massive fortifications, although not outstanding in the wider regional context, and features a finds assemblage with the earliest imported ware dating perhaps into the fifth century BC (if the wheel-thrown Iron Age pottery is not of local origin), and definitively from the second century BC. However, the Umag survey has been unsuccessful in recovering finds from this period from the ploughsoil, pointing, perhaps, not so much to the thinness of the contemporaneous settlement but to a nature of occupation different from the wide-spread Bronze Age pattern. It should be stressed that Sv. Petar has excellent an analogy in Kaštelir near Brtonigla, which has been shown to be intensively occupied in the late republican and early imperial period (Sakara-Šučević 2004, 103-104). The similarity resides not only in the presence of significant quantities of typical imported ware (amphorae, coins, fine pottery), but also in the somewhat marginal geographical position. Kaštelir is situated on the edge of the plateau above the marshy Mirna valley, and probably required a frequent crossing of the river, while Sv. Petar is located on the very tip of northwestern Istria and might have been related to maritime communications. There may have existed more such important settlements in the Bujština region, such as Kaštel near Buje (Cestnik 2010, 156), but overall it seems that their distribution pattern is rather sparse and not related to areas traditionally regarded as attractive, such as the terra rossa plain around Umag. The emergence of local centres in the Iron Age is a well-attested phenomenon (Buršić-Matijašić 2007, 509), but how this is related to the nucleation of settlement, a possible explanation of the lack of data from the Umag survey, is not clear at the moment.
10. ROMAN PERIOD

10.1 Roman Istria

Comprehensive overviews of the historical development of Roman Istria have recently been provided by R. Matijašić (1998) and Alka Starac (1999, 2002). We shall concentrate on several significant points that are vital for interpreting the Umag survey data and for understanding the history of Roman Bujština. The initial period, from the fall of the supposed Istrian kingdom in the siege of Nesactium in 177 BC to the approximately Caesarean epoch, has left surprisingly few finds. Judging by the case of the Sv. Petar hillfort, as well as finds from settlements in Kaštelir near Brtonigla (Sakara-Sučević 2004), Sermin (Horvat, Zakluček: rimska doba 1997a), and Stramare (Poglajen 2007, 48), local social organisation may have provided enough support for current Roman politics, whose priority may have been the pacification of the region, along with the opening of safe trade routes (Matijašić 1998, 36). Presently, there is not enough data to determine the possible continuity of the overall Iron Age settlement pattern during the Republican era, even if there is a number of finds dating to the period from several hillfort settlements (Poglajen 2007, 48-50). An eruption of Roman activity occurred in the mid-first century BC, when the *terra rossa* belt of the “Red Istria” was colonised from the newly established coloniues of *Pola* (Pula) and *Parentium* (Poreč), which is well documented in the epigraphy (Starac 2003). There is substantial historical evidence that Istrian estates started to be very lucrative for the highest ranks of the Roman imperial elite since approximately the half of the first century BC (Tassaux 1992, 188; Starac 2002, 127).

It is quite clear that only agriculture could have been the main business here (Matijašić 1998, 43, 75). Local Istrian elites soon become powerful enough to pursue their carriers in Rome itself (Tassaux 1992, 188). The economic importance of the peninsula, the high influx ofItalic colonists, and, consequently, the very pronounced romanisation in the coastal Red Istria, probably influenced the decision of incorporating Istria in the tenth Italian region which took place, according to A. Starac, between 18 and 12 BC (Starac 2002, 125).

Another Istrian feature which is perhaps easily overlooked is the extraordinarily dense network of small coastal harbours along the western coast, particularly its northern half (Degrassi 1957, 76). While the morphology of the coast, its rockiness, as well as the pronounced submergence of the coastline since the Roman period, all favoured the establishment and subsequent preservation of the harbours (Degrassi 1957, 24), it can still be concluded that they reflect a pronounced commercial character of the local
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economy. Amphorae originating from Istria have been found from Magdalensberg and Aguntum to Rome (Starac 1997).

Possibly due to the importance of agriculture as the main source of wealth, but also its geographical setting, Istria displays a remarkable continuity throughout late antiquity up to the seventh century. This is exemplified by the Dragonera villa, which was modified and reconstructed on many occasions from its establishment as a luxurious *villa marittima* in the first century AD until its abandonment in the seventh century. Some minor traces of reuse have been identified in the subsequent period as well (Starac 2010).

The agrarian Istria has been studied extensively by Robert Matijašić. He points to a disproportion between small towns (Pula, Poreč, Nesactium) and large, densely populated arable areas around them (Matijašić 1998, 43). The colonies of Pula (Pola) and Poreč (Parentium) were served by a common *ager centuriatus* even though there was a pronounced natural border between the two in the dry Lim gorge (Imamović 1986, 70). According to epigraphic and toponomastic evidence, large senatorial and imperial estates are frequent on the western Istrian coast, particularly in the Pula *ager* (Starac 1995). However, in contrast to the Poreč *ager* and the Bujština region, this area was also intensively colonised after the establishment of the Pula colony in the second half of the first century BC. Therefore, the large imperial estates may have had a more significant impact in these areas even though the epigraphic evidence is less abundant there (Matijašić 1988, 14; Matijašić 1998, 58). R. Matijašić has also attempted a demographic estimation, discussed below, according to which the Pula and Poreč *agri* had a population of around 70,000 and the whole of Istria around 100,000 (Matijašić 1988, 96; Matijašić 1998, 59). The most important export was definitely olive oil, mentioned in some sources, as well as attested in numerous finds of production facilities. Wine, whose production is hard to distinguish from that of oil, does not seem to have been as important. Other goods (wool, vegetables, etc.) seem to have had predominantly regional importance (Matijašić 1998, 75-76). However, it is possible that cereals became one of the major export goods in the sixth century (Matijašić 1988, 105).

Rural architecture in Istria, as in the Roman Empire in general, can be divided into three broad groups: luxurious residential complexes (normally situated immediately on the coast and with clear traces of opulence), rural buildings consisting of both residential and production sections (usually considered as *villae rusticae*), and finally specialised production facilities, i.e. workshops for pottery production, oil extraction, etc. (Matijašić 1998, 101-104). Autochthonous village (*pagus*) or farm architecture is, at present, completely unknown (*idem*, 99).

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39 E.g. amphorae inscriptions from Magdalensberg (OLEI HISTR[ici]) and Aguntum (OLEUM HISTR[icum]) (Starac 1997, 144). Pliny also mentions that “Next to Italy, the contest is maintained [in the quality of olive oil], and on very equal terms, between the territories of Istria and of Baetica” (NH 15.3 (8)).
10.2 The Bujština region in the Roman period

Finds from the study area of the western Bujština region appear frequently in the literature since the nineteenth century, but only two works can be classified as systematic topography: the research of Atilio Degrassi on the Roman harbours in the 1930s, and the topographic overview by Robert Matijašić, based on reports from the curators of the Pula Archaeological Museum and his own research. The first provided accurate plans and descriptions of many harbours along the western, and a few along the eastern Istrian coasts, including, in our study area, those of Savudrija, Katoro, Sv. Ivan, and Lovrečica (Degrassi 1957). Matijašić’s work summarises the topography of the north-western coast from the data up to the 1980s, and provides a general account of the historical development of the area in Roman times. From the areas adjacent to the studied region, the published Roman necropoles of Turinija and Kršete (Brtonigla area) should be mentioned (Matijašić 1997). Other available information comes either from the topographical notes scattered over a century and half of collecting, or from the notes and reports of unpublished excavations. Much of the earlier information was gathered by Andrea Benedeti, who has written a general historical overview of Umag (Benedetti 1973). Sašo Poglajen has also gathered a lot of information for the purpose of a GIS study (Poglajen 2007; cf. infra). In general, topographic information is often inaccurate, exact positions of the sites are usually unknown, as also the size and composition of the remains.

An early excavation took place in Katoro in the 1880s ([Amoroso] 1888, 505; Benedetti 1973, 50). Tiola, a part of the Katoro villa complex, was excavated between 1965 and 1971 by Štefan Mlakar and is today still being researched under the direction of N. Bošec-Ferri from the Conservation Department in Pula (Bošec-Ferri and Čučković 2008; Bošec-Ferri 2007). At the moment, no published account of either excavation is available. Large quantities of well-preserved finds from the underwater research in the Savudrija and Katoro harbours are kept in the Umag museum, but the work on analysis and publishing is not yet finished (Brusić 1996; 2009). The Roman, Late Roman, and medieval stronghold of Sipar was excavated by Branko Marušić and Štefan Malkar in 1964-65, but has never been published except for a handful of finds (see Ch. 11). Large rescue excavations were also made the town of Umag. Extensive Roman remains were recorded in the 2004-05 season, when an olive oil production facility was found (Bošec-Ferri 2006), and in the 2008-09 season, when a Late Roman urban layer was identified, along with some finds from the classic Roman period (Čučković 2009). Extensive Roman remains have also been recently excavated in Lovrečica (Bošec-Ferri 2007a), Sv. Ivan (Katunarić 2009), Sv. Lovro (Valfontane) (Bekić et al. 2008), Dajla (Markežić-Petrović 2009), and, in the vicinity of the study area, Kršete (Ujčić 2005).
Since no detailed analyses of the excavated data are available, only a few general remarks can be made here. The earliest Roman finds, besides the Sv. Petar hillfort presented here (Ch. 9.2.2), are Greco-Italic amphorae from the Savudrija shipwreck, dated to the second half of the second and the first century BC (Vrsalović 1974, 21; Matijašić 1998, 48). Recently, a shipwreck with a load of Greco-Italic amphorae has been recorded in the vicinity of Bašanija (Zmaić 2007). By the first century AD, the coastline was dotted with large villas with private harbours, perhaps sometimes surrounded by smaller secondary settlements. At least one of them, the Kotor-Tiola villa complex, can be classified as luxurious villa maritima as it occupies a scenic position, covers at least 700 m of coastline, and features an exceptionally large fishpond and a small harbour (Degrassi 1957, 47-49, T. IV). Another somewhat similar settlement, but probably with stronger economical character, is the rich villa at Sv. Ivan, which was served by solidly

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Data from (Matijašić 1987) except: Valfrontana (Bekić et al. 2008), Umag (Bolšec-Ferri 2006), Sv. Nikola (Bradanović 2005), Markocija (Mihovilić, Bradara and Komšo 2004) and Kršete (Ujčić 2005).
built harbour facilities (Degrassi 1957, 50-53). An important find is a military diploma from Jeci near Petrovija, issued in 194 AD, which testifies to the colonisation of veterans at the end of second and the beginning of the third century AD (Benedetti 1973, 37-40, Matijašić 1986, 83).

The specificity of the Bujština region is the absence of an urban centre, implying a different historical development from that in southern Istria, where the coastal colonies of Pola and Parentium played a leading role. Consequently, the Bujština region probably did not have a centuriated ager, even if the environment and geographical position are no less favourable for intensive agriculture (Matijašić 1986, 92; Starac 1999, 122). It is also supposed that this area did not witness an impact of Roman colonisation comparable to that in southern Istria (Matijašić 1986, 92). However, the degree of the assimilation of Roman culture, i.e. romanisation, is similar to the rest of the western Istrian coast. This is visible in personal names from the epigraphic evidence, which are 76% Latin and only in 24% instances bear certain local characteristics (Starac 1999, 120). In fact, epigraphy attests to large, imperial estates here, as well as those belonging to other powerful aristocratic families, like the gentes Calpurnia or Cornelia (Degrassi 1957, 50; Matijašić 1986, 93; Starac 1999, 85). The appearance of a commentariensis on an inscription from Vilanija (IIIt X/3 50), and a centenarius stabuli dominici from Novigrad (IIIt X/3 53), should be mentioned. These can be dated to the second to third, and the fourth century, respectively (Starac 1999, 85), and both point to the staff of imperial estates (probably a secretary and a stables official). This evidence is much later than an analogous inscription in southern Istria, and has been interpreted as pointing to much later development of large imperial estates in the Bujština region (ibid.). However, there is widespread agreement that the Bujština area was included in the ager colonicus of Tergeste (Trieste), based on the extent of the jurisdiction of the Tergeste church in the Middle Ages and, hypothetically, on the distribution of the typically Tergestine tribus Pupinia across northern Istria (Margetić 1980: as quoted in Matijašić 1986, 93; Degrassi 1954, as quoted in Starac 2002, 274).41

The only settlement from the Bujština region which can be safely attested from the sources (Tabula Peutingeriana) is the Savudrija harbour (Silvo/Silvio). The same source, a medieval transcript of an older Roman imperial map, mentions Insula Sepomaia, which is supposed by some to be in the Sipar area but otherwise cannot be firmly located (Bosio 1974, 35; Starac 1999, 113).42 The overall impression of the settlement pattern in western Bujština is of a decentralised countryside oriented towards coastal harbours and large villae. It should be stressed that the Savudrija harbour is the last stop before crossing to the busy

41 There is no evidence of a Tergestine ager centuriatus either in the Trieste surroundings, or in Istria (Starac 1999, 34).
42 The hypothesis that the term refers to the entire coastal strip, encompassing several Roman villas (Katoro, Tiola, Sipar, Zmabratija), has not been presented with substantial arguments so far (cf. Bolšec-Ferri 2007).
town of Aquilea, 30 km to the north, so that the entire western Buštica region was within the immediate range of this large Roman commercial centre.

By the Late Empire (fourth century AD), transformations of Roman Istria become apparent. The Tiola villa is reused as a cemetery (Bošec-Ferri 2007). An oil facility is set up on the Umag peninsula (or island at the time), analogous to similar structures recovered in Poreč, Pula, and Nesactium, which were interpreted by R. Matijašić in the context of the decline of the Istrian countryside and the ruralisation of the town (Bošec-Ferri 2006; Matijašić 2007). A very similar development has also been attested at the Sv. Ivan villa, where an olive oil extraction facility was set up inside the previously luxurious villa in the second or third century (Katunarić 2009, 375). Burials found at the same site are dated to Late Antiquity (idem, 376). Late Antiquity/Early Middle Ages are, at present, attested in the fortified settlements of Umag and Sipar (Bošec-Ferri 2006; Marušić 1975, 338), while possible data from other sites has not yet been analysed.

10.3 Topographic and Spatial studies

Until recently, the only spatial approach to Roman settlement in Croatian Istria was the study by Matijašić of the agri of the Pola and Parentium colonies (1988). He tried to tackle important (and difficult) questions of spatial organisation and demography, and even applied a rudimentary spatial analysis of the placement of settlements in the centuriation grid (Matijašić 1988, 89-91). According to his estimate, which is derived from site densities, the average estate in the Pula and Poreč agri was around 640 iugera (Matijašić 1988, 89). This is a fairly large surface, already in the smaller latifundia range (ibid.). Based on this data, he also estimates around 40,000 and 25,000 people in the Pula and Poreč agri, respectively. At the same time, the town of Pula would have had about 4,000 inhabitants and Poreč 1,500, rendering them small “agrarian towns” (Matijašić 1988, 96). Matijašić also worked on toponomastics, focusing on possible the traces of the original Roman predia (land properties). The suffixes –an and -ana, presumed to reflect possessive forms derived from the owner’s names, sometimes correlate with Roman archaeological remains. For example, on the Barbolani site a votive inscription devoted to genio Barbulani was found, which Matijašić considers as possibly deriving from Barbii, the original owners of the estate (Matijašić 1988, 79). The clustering of these toponyms in the vicinity of Pula is thought to reflect the magnitude of the colonization, as opposed to the Poreč ager, where large imperial/senatorial estates may have predominated (e.g. Loron, Seget) (Matijašić 1988, 97).

43 According to an older estimate by M. Suić, derived from historical methodology, the average size of a predium would have been 50 iugera only (Starac 1999, 35).
A completely different, geo-statistical approach has been deployed by S. Poglajen in his unpublished PhD thesis (Poglajen 2007). He applied a range of statistical and analytical GIS methods (classification of sites based on cluster analysis, optimal paths, various analyses of spatial correlation, economic potential, etc.) in the area covering Bujština, Slovenian Istria, and the Trieste area. From his conclusions, we can sort out a proposition for the major Istrian road, *Via Flavia*, to the east of Buje, through the village of Triban. He also established a spatial correlation between areas of good economic potential and Roman agrarian sites (Poglajen 2007, 136).

Even if the approaches of R. Matijašić and S. Poglajen are very different, they still use databases of comparable quality and share some problems that can be tackled with field survey. First of all, there is no in-depth consideration of small (“non-villa”) sites. S. Poglajen has attempted to discern this group through complex statistically-based classification (group 4: Poglajen 2007, 96). However, the overall pattern is hard to interpret (Poglajen 2007, 97). Matijašić, on the other hand, has already worked on a typology of Roman rural architecture (Matijašić 1982), but the data is probably too patchy to be included in the analysis of the Pula-Poreč *agri*. Therefore he operates with a set of sites considered to be of equal importance – almost exclusively *villae rusticae*. Consequently it is not possible to approach the original heterogeneity of the settlement pattern (big vs. small sites, etc.), but only an idealized model based on an approximated average-sized rural estate.

The excavation policy for the Roman period is comparable to that for later prehistory in its fixation on large, luxurious villas or cemeteries. There are some rare examples of early excavations of smaller estates, such as the small *villa rustica* in Labinci, 15 x 15 m large (Matijašić 1998, 302). However, with the recent wave of infrastructural construction projects (highway, pipelines, etc.), as well as less permissive cultural heritage management, smaller sites have started to turn up. An interesting find is a an oil processing facility in Mala Šurida, a small building 18 x 13 m large, containing two oil presses and additional workshops (*officinae*). It probably belonged to a large *latifundium* in the surroundings of Fažana (Ujičić 2007). In any case, we still have no data on sites that are not predominantly composed of extensive masonry remains. As an example of this ambiguous type of Roman site we can refer to the excavations of C. Raynaud and other archaeologists in Languedoc (France), who paid particular interest to the so-called *petits établissements* (Raynaud, Pomarèdes and Manniez 2009, 143-147). The smallest type are single-roomed structures, 30-50 m² large, sometimes not completely enclosed by wall. The masonry is sometimes without mortar and the finds assemblage is extremely poor (*idem*, 143). There is also a number of somewhat larger structures (c. 300-400 m²) which lack some basic inventory expected in a solid habitat (hearth, pottery assemblage, etc.). The function of these sites is elusive: often referred to as
annexes, they could have been temporary shelters for seasonal workers or other specific activities. The larger enclosures might have been used for herding.

![Diagram of a building layout](image)

**Figure 75** Labinci *villa rustica* (Matijašić 1998, 144) (left); Mala Šurida oil processing facility (Ujčić 2007, 274) (right).

Also, the diachronic perspective on the evolution of the regional settlement pattern is restricted to discrete (disconnected) evidence from the excavations that tend to concentrate on large, rich architectural complexes. For instance, at the moment we cannot say much about the exact local impact of the third-century changes in terms of site densities and demography. Many other conclusions may be drawn from a detailed knowledge of the spatial distributions of archaeological sites, for instance the organisation of production, nucleation, and dispersion tendencies, and, in ideal conditions, single property extents (e.g. in Africa: Leveau 1993, 59: fig. 8).

The final research topic listed above should be briefly reconsidered. Matijašić has already tackled the problem of the average estate size, but he also reminds that due to different regimes of land tenure large properties may have been parcelled out. This should be considered in the case of large tracts of land under the imperial *fiscus*, which are well attested in Istria, particularly in the Poreč and western Bujština regions, known from the general historical context to have been rented or sold to private estate owners. In
fact, by the end of the second century a recolonisation of deserted lands is known to have been encouraged, in order to alleviate the early signs of an economic crisis (Matijašić 1988, 97; this may also be the wider historical context of the Jeci military diploma: Benedetti 1973, 37-49). These lands also included imperial property (Matijašić 1988, 99). In addition, Matijašić warns that this complex evolution of the agricultural landscape may have resulted in patchy, fragmented properties, which can easily be confused with small rural properties when interpreting the archaeological data (Matijašić 1986, 94). Therefore, archaeology will most probably encounter great difficulties in reconstructing the cadastral (juridical) reality.

However, it is the other, more mundane reality that emerges in the field survey – the actual activities done by people on the land. We may be dealing with two perspectives that can be regarded as both complementary and opposed to each other: the de iure status and the de facto state of affairs. Concentrations of archaeological sites or off-site artefacts can be, at least theoretically, linked to the intensity and nature of human activity in the landscape, which is less apparent from epigraphy and other historical sources heavily biased towards the upper social classes. For instance, reading Matijašić’s account of the Pula and Poreč agri one may get the impression that only free (freed) men occupied the land (Matijašić 1988). Slaves are completely absent even though he frequently refers to the works of Andrea Carandini, a major proponent of the Marxist approach to Roman economy (Dyson 2003, 27). Roman estates of 600 iugera (on average!) are indeed not imaginable without substantial familiae rusticae, at least in the heyday of the first to second century. Detailed field survey may not be able to reproduce legal relationships accurately, but on the other hand may offer a means for reaching the “silent majority” through their imprint on the land they tilled.

10.4 Survey results

Almost all the Roman period sites recorded during the Umag survey are ploughsoil scatters, reflecting the strategy of the survey discussed above (Ch. 7). As it can be expected, the Roman period (first to sixth century) is predominant in the surface archaeological record of the terra rossa plain of western Bujština. Overall, thirty-three Roman sites were recorded. Several representative examples will be briefly presented below.

In order to understand the original function of the discovered sites, a GPR (ground penetrating radar) survey was made in 2009, and indeed proved to be extremely informative (see p. 109). It has clearly shown substantial architectural remains related to surface scatters on three sites. The site of Seget 3 behind the Seget stanzia (a nineteenth-century estate), is one of the largest in terms of the finds scatter,
approximately 150 x 200 m. The scatter is comprised of an amorphous construction of ceramic fragments and stone; pottery is not very abundant, but still present in a larger quantity than on most other sites. Using the GPR in a surface 33 x 27 m large at the presumed centre of the artefact scatter, a part of a larger architectural complex was detected. A small, 5 x 2.5 m large structure which lies deeper than the rest of the building may be a cistern (Figure 76).
The site of Makale 3 was encountered in a freshly damaged state in 2007, and by 2009 it was apparent that regular ploughing and field clearance, if continued at the same pace, may cause the site to be lost within a few years. In 2007, a dark patch along with chunks of mortar and charcoal was clearly visible on the shoulder of the slight slope that is probably the spot most affected by the soil displacement (Figure 77). Very crude mosaic *tesserae* were found as well. The size of the finds scatter is approximately 100 x 100 m, but few diagnostic pieces were collected during the recording procedure. GPR survey was done on an unfavourable surface (at the border of the field covered in discarded stone), but some anomalies were detected that roughly correspond to the recorded position of the destroyed architecture. This is also the only site discernible on the aerial photo, where a rectangular structure 100 x 120 m can be traced (Figure 40: right, p. 108).

Close by the Makale 1 site is situated. Again, the site had been freshly destroyed for the purpose of planting an olive orchard, but here we were informed that the parcel had previously been untilled and used as a stone dump. The scatter of artefacts and construction remnants (tegulae, mortar, stone) is not very clearly distinguishable, but unlike any of the other Roman sites found, it can be delimited with some certainty. Pottery and other finds are more visible, and even a coin has been collected (not yet analysed). The GPR showed clear traces of architecture, possibly with a cistern again, although with some lacunas which cannot be interpreted with certainty, but may point to the complete disappearance of subsurface remains. This is, in fact, what might be expected in the case of deeply ploughed field, as we have been informed by the owner. A conical stone which is probably a fragment of a Roman weight was recorded in the Makale hamlet (Figure 78: bottom). Identical weights 3 and 50 *librae* heavy were found in Krvavići-
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Boškina, in southern Istria (Čimin 2007, 134-135). The Makale weight could have been brought from any of several sites in the proximity. Relatively frequent occurrence of this type of artefact in western Bujština (e.g. at the Roman villa in Sv. Ivan, unpublished) is indicative of the commercial character of Roman settlement in the region.

Figure 78 Makale 1: the GPR survey (Skelac 2009), and the supposed Roman weight, as found in a courtyard in the hamlet of Makale.

Additional evidence comes from the field notes of Š. Mlakar, who reported on freshly destroyed Roman site between Makale and Petrovija. Most probably the site corresponds to the vague scatter 80 x 110 m in size found in the 2007 survey and labelled Petrovija 8. While we have been unable to record any significant characteristics other than the overall size of the scatter, forty years ago numerous stamped tegulae, amphorae fragments, and chunks of masonry were visible on the surface (Mlakar 1979, 35-37). Matijašić also reports a piece of a funerary stele and stone elements of an olive press (stipites) (Matijašić 1986, 84).
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These sites appear to correspond to the *villa rustica* type, especially if the small sunken features represent cisterns. No other type of settlement would suite sites of such size, finds assemblage, and architectural features (cf. Matijašić 1998, 101-103). Their roughly even distribution in the landscape is an additional argument for this interpretation. The problem is whether other scatters of comparable size can be considered as similar buildings. Probably most of them do fall into the category of rural agricultural architecture, as this type of site is very abundant in Istria (and elsewhere), but it should also be expected that some other types of sites might be represented. For instance, according to Matijašić (1987, 83), as well as local tradition in the village of Jeci, the site of Tornina might be a necropolis.\(^{44}\)

The remaining of the recorded Roman sites, small find scatters, are ambiguous. Often these are comprised of ceramic building material and small cobbles, or other irregular stone only, and in most cases do not contain easily detectable diagnostic pieces of pottery. In some cases, like Makale 2, higher quantity of fired clay was found, indicating, possibly, some specialised function. The possibility of multiple post-depositional processes also has to be taken into consideration (see Ch. 6.6.1, p. 89). Because of the low data quality an interpretation cannot be given for none of them at the moment. As already mentioned, no convincing parallels are recorded in Istria, although some sites excavated in recent rescue programmes display characteristics that may provide some analogies. For instance, the site near the Portun *stanjla* (Poreč) seems to be quite “rustic”, and due to numerous finds of nails the excavators suppose substantial constructions in wood. However, the site has also produced large quantities of tegulae and the excavators believe the structure to have been fairly large (Kovačić and Brnić 2009). Mala Šurida seems too specific in both the function and architecture (cf. supra).

10.4. 1 Dating sites

Unfortunately, the collected surface finds seem too meagre to allow any chronological distinction other than Roman or post-Roman, while an in-depth analysis of fabrics has not yet been conducted. However, in cases where some indications exist, dates can be shown to begin in the first or the first half of the second century AD. The Kršete necropolis, 5 km to the east of the surveyed area, is also dated to the second half of the first and the beginning or the first half of the second century AD (Matijašić 1997, 107). On some sites, e.g. Seget 3, pieces of pottery dating to the later Roman period were observed (characteristic grooved ware), which may suggest continuity at the larger sites. The same trend is also evident in the better-researched southern Istria, where the majority of large rural buildings were established between the first and the second century AD (Matijašić 1982, 63), while many larger sites

\(^{44}\) In fact, many large villas have been used as cemeteries in the late Empire (i.e. Sv Ivan (Katunarić 2009, 376), Tiola (Bolšec-Ferri 2007), so these two categories of site are not mutually exclusive.
show continuity up to the sixth or seventh century (e.g. Brijuni; Marušić 1975, 337), Dragonera (Starac 2010, 19), Stancija Pelićeti (Džin 2007, 257). Therefore we can suppose a broad contemporaneity of the majority of the larger sites at least in the early imperial period (first to fourth century AD). However, small sites are very problematic and at present we have no exact information on the distribution of dating ranges, nor any comparative data from Istria. Our impression from the field survey is that the classic Roman material is predominant (first to third century), but further research is necessary.
A specific problem that has to be stressed is the confusion of Roman and post-medieval pottery. Not only does the fabric of abraded Renaissance ware mimic that of Roman pottery, but the composition of both assemblages is also similar in the predominance of building ceramics (Figure 88). Weathered, amorphous fragments of ceramic building material are even more difficult to distinguish. Furthermore, in Špinel a small brick factory operated in the late nineteenth to early twentieth century. This may have masked potential Roman sites in front of the Špinel settlement. The survey conditions only aggravate the problem (mud, cold, fatigue, etc.), and a certain degree of error has to be taken into consideration. The problematic situation can be visualised by plotting the off-site results from the Špinel area (Figure 79). Only in a few cases does the distribution of ceramic building material from the Roman period differ clearly from the post-medieval. However, that the problem is not only in the success of field classification is apparent in the plot of Roman and post-medieval glazed pottery (Figure 79). The latter type is somewhat easier to distinguish even if this is not as straightforward as it may seem, since the glaze has often disappeared from the smaller, weathered fragments. Some suspicious correspondence still occurs, but it also appears that a certain amount of overlap in the distribution of both periods should be expected. It can be hypothesized that ancient sites were avoided because of large amounts of stone and other debris, as was the case with the Makale 1 site, and served as dumping grounds in the post-medieval period. In future research the problem should be addressed with finds analysis and more successful field classification, backed by a sampling strategy. In any case, our approach, even if not satisfying, is much better than the common clicker counting, which may produce a completely misleading image.

45 As we have been informed by local residents.
10.5 Roman landscape: discussion

Only the area in the hinterland of Umag will be used in discussing the Roman landscape, as the Savudrija region provides too patchy a dataset, which was also collected using too crude a methodology (see Ch. 6).

10.5.1 Spatial analysis of the settlement pattern

**Overall distribution**

The overall spatial distribution of the Roman sites shows pronounced patterning in the selected area, especially in its southern part. The sites seem to be distributed along a northeast-southwest axis running toward the Sv. Ivan port. Field survey in the areas west of Seget and in the direction of Stancija Ambrozi (see overview map on p. 100) has not produced much data, which we suppose to reflect the situation that can be expected in the areas adjacent to the survey area to the west and east. Off-site finds also seem to decrease in frequency there. The small sample around Materada also shows lesser concentration of sites and off-site material. Based on this evidence we would suggest a zone sparsely populated with archaeological sites, which testifies to a lesser intensity of human activity in the south-western and south-eastern corners of the surveyed area. Possible explanations for this patterning may be reached by comparison with environmental and other archaeological data, as we shall demonstrate below.

![Figure 80 Overall distribution of Roman sites.](image)
Environment

The pedological situation in the chosen sample of the study area is quite uniform; the soil is almost entirely composed of heavy terra rossa, with some localised alluvial sediment in the lower course of the Potok stream.\(^4^6\) In a few places a calcareous bedrock emerges, as for instance on the Tornina site, but this seems to be a very rare and localised phenomenon. Unfortunately, this situation eliminates the possibility of a detailed analysis of the relationship between the position of the sites and the distribution of the soil. However, because of the uniformity of the area the clustering of the sites on the south-west to north-east axis becomes even more apparent. Pedology does not seem to be a major factor influencing the choice of site location, even if it may be safely assumed that deep, continuous terra rossa was an attractive ambient for Roman agrarian establishments in general (cf. Matijašić 1986).

Figure 81  Soil coverage and site distribution (soil map: Škorić, Mayer et al. 1983).

Communication network

The local topography and soil cover do not show any significant correspondence with the recorded settlement pattern, which might be due to the local road network. The proximity to communication is certainly an advantageous setting in the context of commercial agriculture, but also in many other cultural aspects (cf. Fovet 2010). In this perspective, the extended distribution of large Roman sites from Makale to Villanija can be seen as reflecting a communication running across the plain in the direction of the Sv.

\(^4^6\) We are using a 1:150,000 soil map (Škorić, Mayer et al. 1983) which is still rather detailed since it has been composed from the data for a 1:50,000 basic soil map.
Ivan harbour, and possibly to the north-easte in the direction of the Via Flavia regional road (Matijašić 1998, 423) and/or a coastal corridor in the direction of Piran (Truhlar 1975, 100). Another branch of the area of high site density might be running across Špinel, but as the sites appear on the edges of the survey coverage it is not possible to assume some specific pattern. Perhaps it points to a communication leading to the archaeologically rich area of Katoro-Sipar. The opposite extension of this axis would lead to Kršete, an area already known for Roman finds close to the presumed corridor of the major Roman road, Via Flavia, leading to the Parentium and Pola colonies.

S. Poglajen has already attempted a modern, numerical method in the study of the Roman communication network (least-cost pathways). Some paths that have been extracted by statistical procedures in Poglajen’s analysis may seem appropriate for further discussion, but because of the very high density of the modelled network it has to be acknowledged that selecting a suitable path is more likely than failing to do it (Figure 82; Poglajen 2007, 98ss). On the other hand, his proposal of the Roman road network in western Buština is focused on the supposed major settlements such as Savudrija, Umag, and Novigrad, and does not include the communication axis which is we have shown to diagonally traverse the Umag plain. Moreover, it has to be pointed out that neither Novigrad nor Umag seem to have become settlements of any importance before Late Antiquity (fourth century or later) (cf. Matijašić 1986).
Old topographic maps point to a road leading from Umag to Sečovlje and the Slovenian coast that was abandoned during the nineteenth century. The road is represented on the map by Giovanni Antonio Cappelaris (1797) (Lago and Rossit 1981, T. CXXVI) as passing through Vilanija (Figure 83). It should be remarked that there are some obvious errors on the map, for instance the road to Buje is shown as missing the village of Petrovija, and the road network is in general schematic. However, it is apparent that the cartographer’s main purpose was to represent the important stops and nodes in the network, and this seems more or less consistent. Furthermore, an abandoned part of the road between Sv. Vid and Sv. Nikola was recorded during the 2008 survey without the awareness of its historical context. It seemed to be a fine example of an old road, approximately 2 m wide and with shallow wheel grooves 100-120 cm apart.\footnote{A similar abandoned road was recorded at the foothill of Markovac, with wheel grooves approximately 100 cm apart (see Figure 60). This road also follows the same route from Umag to Sečovlje.} This evidence is in good accordance with Cappelaris’s map. The southern part of the supposed Roman route would have followed a corridor of high site density between Vilanija, Petrovija, and Sv. Ivan, but at present we are unable to interpret the modern road network as a direct reflection of the Roman one (Figure 83).

It can thus be proposed that the distance from the land route played an important part in the choice of settlement location. In this perspective, the entire pattern has to be understood in the wider context of
maritime communications, since the supposed road heads towards the harbour of Sv. Ivan, and there can be little doubt that harbours played a key role in the transport of agricultural produce from Istria, as mentioned in the historical introduction.

**Clustering**

The first step in the analysis of the spatial correlation of the obtained field survey data is to devise an appropriate classification scheme. Assuming equal importance of all sites can be viable only in the absence of fine-grained data. Using the currently available information, without a finds analysis, we have divided the Roman sites into two broad types, large and small, according to the size of the surface scatter. In ambiguous cases the maximum density and diversity of surface artefacts were also taken into account. The criteria was set according to the site Makale 3, which was considered as of minimal size for the large site category, measuring little over 100 x 100 m. This category is actually corresponds to the type of big agricultural establishments that can in some cases be interpreted as *villae rusticae*, as discussed above.\(^{48}\)

The issue of contemporaneity has also been discussed above.

When plotted on the map, the spatial relationship between large and small Roman sites becomes evident: they seem to be clustered. It is very difficult to propose a figure for the maximal distance between two or more clustered sites because their economic and legal relationships are unknown. By observing the patterning of small-big site distributions and off-site scatters around sites documented in the 2008 season, we have come to a figure of approximately 300 m as a maximum distance to be expected in the case of clustered sites. The interpretation that seems plausible to us is some functional relationship, closely related to the hierarchical organisation of space which can be assumed in the case of Roman system of land control/ownership and agrarian production. Thus in the case of their spatial proximity, the small sites reflect some activity related to the big ones. However, the image offered by the employed method has to be understood in terms of the available data. There must be significant diversity within both the big and small site category, but that cannot be deduced form the data collected.

\(^{48}\) The dimensions of common *villae rusticae* in the Pula region are around 50-60 meters (Kolci 60 x 50m, Šijana 40 x 30, Šaraja 50 x 50) (Matijašić 1982), and the villa in Kršete, close to our study area, is 60 wide and probably not much longer (Ujčić 2005). The exact relations of these measures to the size of the expected ploughsoil scatter are not known.
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Figure 84 Clustering of sites in the surveyed area.

Average property size

R. Matijašić has already proposed the existence of large estates in the Umag area \textit{(cf. supra)}. These estates may have comprised several clusters of inland agrarian sites that do not even have to be contained in a continuous piece of land. However, what may be inferred from the archaeological data presented so far is a significant degree of \textit{de facto} independency of the larger establishments, which we have interpreted as \textit{villae rusticae}, even if their legal status may be more complex \textit{(cf. supra)}.

In order to obtain a figure for the average property based on the survey results we have made simple Voronoi cells around the clusters of sites or single large sites standing in isolation.\footnote{The definition of the Voronoi diagram, also known as the Thiessen polygons, is that each site has a Voronoi cell that encompasses all points that are closer to this site than to any other. The limits of the cells are determined by drawing perpendicular lines through the midpoints between sites. It is a widely used spatial analytical method (e.g. Novaković 2005; Slapšak 1995, 49-50). A modified, weighted version, where limits do not pass through the midpoints, can be found in the hillfort study by Karouškova-Soper (1983, 85).} This calculation...
relies on several assumptions: contemporaneity, distance-based settlement organisation (the further, the less attractive), equality of chosen sites (non-hierarchical organisation), and the homogeneity of the landscape in terms of obstacles and preferred/repulsive environment. Apparently, none of these conditions can be proven to have existed in the Roman time. However, this method does provide a framework, however idealised, for further considerations of landscape organisation in terms of land partition and agrarian production. It also has to be stressed that the analysis cannot be related to the zones in the south-eastern and south-western corners of the research area (Rožac and Stancija Ambrozi), for which we hypothesise different land use regimes (cf. supra).

Figure 85 Voronoi polygons based on Roman sites and site clusters in the Umag hinterland area.

Only six cells can be used for the analysis. Three are completely closed (dark blue), one is nearly closed and the northernmost two are reconstructed by delineating karstic badlands (light blue) (Figure 85). The average surface of the presumed directly controlled economic zone thus obtained is just under 90 ha or 353 iugera. This figure is little over half the amount estimated by Matijašić in the southern part of Istria (640 iugera), which, moreover, was more densely inhabited and is even supposed to have had
smaller-sized properties than the north (Matijašić 1986, 92). The consequence of accepting the obtained figure as the typical size of a property in western Bujština would be the rejection of the widely accepted notion of large, latifundia-like estates in northern Istria. That, however, would be a repetition of the common methodological mistake of assuming homogeneity in a wider area, or, in other words, assuming the representativity of the sample. Therefore, the proposition of 350 iugera estates may be only valid for the area covered by the survey. At the same time, the lack of homogeneity in the spatial distribution of the sites, especially in the southern part of the surveyed area, poses serious problems in the application of the Voronoi diagram. In other words, the assumption of the homogeneity of individual properties does not seem to be fully valid for the surveyed areas, although it also has to be considered that significant portions of the land were left fallow, abandoned, or covered in forest. Therefore the proposed analysis is only a step towards further research of the organisation of the Roman rural landscape. Nonetheless, we believe that it is still an important contribution to the archaeology of Istria, considering in the first place the accuracy of the field survey dataset, as well as the methodology of spatial analysis, which can provide a solid base for further study.

10.5.2 Off-site distributions

More than any other type of data, the off-site is determined by the methodology of data acquisition. As discussed above (Ch. 7), one of the biggest differences between the 2007 and 2008 surveys are the improvements in off-site recording. The “fast approach” that was based on tract recording seems to be too crude, offering information of very limited value, perhaps better for detecting possible missed sites than for a true study of artefact discard patterns (Figure 87). The next season introduced more detailed off-site recording, organised into broad archaeological periods (Figure 86). Besides allowing the true non-site approach that has proven to be a big help in detection and recording of many severely destroyed sites, the improved methodology has finally unveiled the complex pattern of the “artefact carpet” stretching across the more densely inhabited or used portions of the landscape.

It should be noted that in more recent works R. Matijašić refers to the figure of 475 iugera as the average size of the Roman estates (Matijašić 1998, 309). This is, in fact, the raw average extracted from the number of Roman sites per one centuria (Matijašić 1988, 87). Regarding his original analysis (Matijašić 1988), however, it is not clear which centurias were chosen as the sample, and the spatial distribution of the sites is rather inhomogeneous (out of the 89.5 centurias chosen as the sample only 33 contain sites). Because of these reasons neither the calculated average of 475 iugera per Roman site, nor the estimate of 640 iugera per Roman site, are not directly comparable to our result due to significant methodological differences.
The overall impression is that the off-site material either surrounds the dense scatters interpreted as sites, or appears locally, in a pattern which, because of the very small survey coverage at present, cannot be fully understood. A continuous distribution stretching across the entire landscape, such as has been documented in areas with very rich surface record (e.g. Beotia: Bintliff 2002), is not the most appropriate model for the Umag area. In order to arrive at an interpretation of the off-site pattern in the Umag hinterland we should take a look at the composition of off-site material (Figure 88). More than two thirds of the recorded material belong to ceramic building material (brick, imbrices, and tegulae), while the pottery is heterogeneous, mostly Roman and post-medieval. Here we would point once more that there has been some degree of confusion between the Roman and post-medieval material, as they are difficult to distinguish on tiny, amorphous pieces in field conditions (Ch. 10.4.1, p. 187). In this respect it is reassuring that the ratios of Roman and post-medieval pottery roughly correspond to the ratios of ceramic building material. Nevertheless, isolated, sparse, or otherwise ambiguous finds of either period have to be excluded from analysis.
10. ROMAN PERIOD

Figure 87 Off-site distributions in relation to site clusters (Špinel sector: above; Vilanja sector: below).
It is unlikely that the off-site assemblage composed predominantly of ceramic building material represents a typical “manuring” discard pattern. Presumably, kitchen refuse, containing some broken pottery, is the key for distinguishing manuring practices in surface survey (for an in-depth discussion see Ch. 4.4.2). A related problem is the rate of pottery consumption and other cultural patterns that influence the creation of specific finds assemblages (Ch. 4.4.2). The surveyed area is far from any larger urban settlement where both high consumption of pottery and specific waste disposal patterns can be expected. Not much can be said about the Roman sites identified in the Umag survey, but it is most probable that they are not comparable to the coastal villae, which sometimes have rather rich, diverse finds assemblages composed of a range of imported wares (e.g. Tiola: Bolšec-Ferri 2007; Bolšec-Ferri and Čučković 2008). Until further analysis it can only be generally supposed that the off-site assemblage from the study area is to a certain degree a reflection of the relative scarcity of the on-site assemblages.

In the case of the off-site finds from the Umag survey we would suggest a range of badly preserved “small” sites that represent different ephemeral agricultural constructions, along with field boundaries or paths that may have been partially paved with some construction material (Figure 89). Some amount of the material may indeed emerge from manured fields. Such a multiple scenario would correspond well with at least the post-medieval period. One problem that should not be overlooked is that the area where
the survey has been the most detailed is severely damaged by agriculture and it may well be that in other places the off-site would produce a clearer picture (see p. 89). The information that would permit further assessment of the off-site assemblage formation is the precise quantitative comparison with on-site assemblages. This is not possible at the moment. In any case, the possible absence of manuring activities in the off-site record does not have to be related in any way to the manuring as an agricultural practice. The manure may have been completely organic, and at present we are very far from a clear understanding of Roman agricultural practices in western Bujština.

![Figure 89](image)

**Figure 89** A means of off-site assemblage formation.

### 10.6 Conclusions

The Roman period is the most abundant in the survey catalogue but its interpretation is seriously hindered by the lack of in-depth data analysis, in the first place a study of the pottery. This prevents us from forming a true historical perspective. In fact, we are pessimistic about the finds collected, often a handful of coarse pottery fragments, as the sites have proven to be much poorer in surface artefacts than expected. The solution would be to intensify the finds collection, but this would slow down the survey and shrink the spatial coverage. Therefore, in order to come to a fine-grained image of Roman Bujština, intensive site-based research is necessary. Another problem, often mentioned, is the small size of the researched area. It has to be kept in mind that we operate with a detail of a wider cultural landscape, a detail that most probably is not very representative for the rest of western Bujština. Nevertheless, the interpretative potential of the sample far surpasses any purely excavation-based approach, as it offers a glimpse into the wider spatial organisation of Roman communities.
For the purpose of demonstrating the interpretative potential of the survey data, we have applied several basic methods of spatial analysis. Here again the quality of the dataset has to be carefully considered before reaching firm conclusions. Based on the distribution of discovered sites and its relationship to the natural and cultural landscape we have proposed that the settlement pattern is influenced by the local communication network, at least in the Seget-Petrovija sector. This should be understood as a detail in the wider image of Roman settlement that cannot be fully appreciated from the data available at the moment (e.g. the relationship between the coastal villae and inland properties, environmental preferences, etc.).

On a smaller scale, a clustering pattern of Roman sites has been observed. This has been interpreted as signalling some sort of hierarchical organisation, i.e. traces of larger estates grouping one larger with several smaller establishments, presumably in most cases a villa rustica and the accompanying facilities. It has to be stressed that the data that we have at disposal is rather poor and that we have been unable to sort out specific types of Roman sites such as necropoli, villages, or other unusual rural establishments. In any case, the data obtained by geophysical prospection does support the image of a landscape mainly populated with typical agricultural estates, usually referred to as villae rusticae in the context of Roman Istria.

Based on these conclusions we have considered it appropriate to calculate Voronoi cells around site clusters, thus obtaining a basic territorial model. Although this model is highly simplified and heavily influenced by the spatial coverage of the survey, as well as probable classification errors and lacunas in the dataset, we still believe it may be interesting in the context of the topic of the average size of the Roman estates in Istria which other researchers have previously tackled (cf. Matijašić 1988). However, we do not consider the obtained figures in any context outside the surveyed area because of the small size and marked homogeneity of the researched terrain.

As in the case of prehistoric landscape, the Roman period data from western Bujština fits into the existing interpretative framework only in general terms. A rural culture oriented towards the sea, presumably because of the predominantly commercial character of the local agrarian economy, has already been well attested by previous researchers. On the other hand, the landscape dotted with medium-sized agricultural properties does not convey an image of large imperial estates that may be inferred from the epigraphic evidence. We have noted, however, that these two types of settlement systems are necessarily mutually exclusive, but may stand for de facto and de iure contexts. Even if the data from the sites are scarce, they are sufficient for recognising a set of villae rusticae, instead of directly dependent economic facilities that function within vast trade-oriented estates. Nevertheless, in the recovered data
there is nothing that would contradict the possibility of indirect relationships of dependency and loose hierarchies, especially in relation to the large and opulent maritime villae.
11. STRUCTURAL SURVEY OF THE SIPAR PROMONTORY

As an additional project, an intensive survey of the important Late Roman/Early Medieval fortified coastal site of Sipar has also been undertaken. The site is attested in the sixth or seventh century through its mention, together with other settlements on the western Istrian coast, in the *Ravenna Cosmography* as *Sapparis/Siparis* (Križman 1997, 355, 366, 369). M. Križman suggests that Sipar may refer to some unknown nearby settlement rather than the castellum itself (*ibid.*). The site was partially excavated by Štefan Mlakar and Branko Marušič from the Pula Archaeological Museum in 1964-65, but the results were never published, aside from a few finds and a general description (Marušič 1975, 338-340, Marušič 1986, 86). We have been able to obtain a plan of the architectural remains recorded in the course of the work, which is kept in the Pula museum, along with a few reports that mention the excavation. These data have proven to be very valuable, but also insufficient and imprecise.

The 1964-65 excavation revealed a very complex, multi-period settlement, which was then divided into three phases. The first phase is not mentioned in the works of Marušič, but most probably refers to the first- to second-century Roman material which has been identified in our survey as well. Matijašić, however, mentions a Republican silver coin from the end of the second or beginning of the first century BC as the oldest find from Roman Sipar (Matijašić 2005b). According to Mlakar, who organised the fieldwork, the second phase extends from the second half of the second century to the end of fourth century, but only the third phase, Late Roman to early medieval, has been described in some detail. Most of the architectural remains were attributed to this period, including a massive fortification that is easily recognisable in the remains of a polygonal tower, a network of smaller rooms that formed a habitat, and a *horreum*, a long building with typical buttresses along the walls. The use of spolia and the reuse of earlier foundations were also noted. The settlement was described as built according to a U-shaped scheme, with entrances into multiple rooms from the seashore. The inhabitants were described as peasants, fishermen, soldiers, and craftsmen, judging by the numerous small remains, including an olive millstone, pieces of an olive press, pottery, fishing gear, jewelery, and pieces of weapons. The youngest find is a circular, cast bronze fibula with a panther motive and enamel inlay that can be attributed to third phase of the Carantanian-Köttlach culture (850-950) (Marušič 1975, 340; Matijašić 2005b). From the historical record it is known that Sipar was destroyed in the 879 raid by the Croatian duke Domagoj, along with Umag and...
several other medieval Istrian communes (Matijašić 2005b). It is believed that life on Sipar was not afterwards restored in a significant extent (ibid.).

Prehistoric finds from Sipar are also known, dating from the late Iron Age, (Lonza 1977, 111, T. 10: 18, 19), but no further information regarding this phase is available. K. Mihovilić classified two bone implements published by Marušić as prehistoric, but did not propose their dating (Mihovilić 1995, 37: fig. 7)

Some interesting information is available for the harbour of Roman and medieval Sipar (Brusić 2009). Small pier made of amorphous stone is sheltering the bay from the west. Inside the harbour the team led by Z. Brusić has identified a small rectangular platform which was possibly used for lighting fire to help navigation (Brusić 2009, 251).

To conclude, the available data on the important site of Sipar is very vague, if not unreliable in some instances. All that is known from the prehistoric phase are two pieces of late Iron Age pottery and two bone implements without any additional information. As the late Iron Age pottery is sometimes deceptively similar to the Late Roman coarse ware (both contain high levels of mica or quartz in the temper and both were made on the slow wheel), we should be careful when drawing any conclusions solely on this basis. Marušić’s brief description is centred on Late Roman/medieval finds and provides several drawings of the material from this period. The architectural plan made in 1965 that we obtained in the Pula Archaeological Museum at first seemed to be accurate, but when compared with the results of our survey it turned to be quite simplified.

Environmental setting and formation processes

The site is situated on a tiny peninsula that is today regularly separated from the mainland during the tide. The major problem with Sipar is its progressive deterioration due to marine activity, a process that is clearly demonstrated by comparison with older photographs (Figure 90). Such an event was also witnessed by our research team on 1 December 2008, when an unusual tide considerably damaged Sipar, causing havoc on the entire Istrian coast as well. Large portions of sediment were stripped off and segments of collapsed walls were displaced. An additional destructive factor that cannot be easily evaluated is the long history of scrambling by curious tourists that occupy the site for about a half of the year.

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51 We have found a piece of information in the Umag museum archive, probably by Rino Cigui, according to which Sipar was bombed by German forces in 1944.
Much of Sipar is in a state of near-total destruction. The coastal areas are mostly stripped of their historic sediment (archaeological strata), and the only remains discovered are dents and grooves in the rock substrate, sometimes accompanied by traces of mortar. On the south-western tip of Sipar, which faces the strong southern wind (Jugo), it is often the parts of the wall foundations that actually protect the terra rossa soil under them, creating raised and extremely fragile formations that probably will not last.

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long until final eradication. A carless touch is sufficient. Conditions have been somewhat more favourable on the periodically submerged strip between the entrance structure and the raised part of the site, where the foundations of structures are still preserved, along with the earlier historic sediment that is covered by stranded debris containing later material. Inspection after the tidal event revealed that the preserved sediment is mostly composed of the *terra rossa* substrate, implying that only the earliest (Roman?) phase can be expected to be preserved on this area.

![Sipar in calm and in rough weather conditions.](image)

**Figure 91** Sipar in calm and in rough weather conditions.

**Methodology**

The methodology of research consisted of intensive finds collection in a 5 x 5 m grid and the structural survey of all man-made features. However, the state of preservation, and especially the degree of the displacement of surface material by marine activity, as witnessed after the tidal event on the 1. December 2008, led us to abandon intensive collection. The surface assemblage is quite impoverished, at least
regarding the expectations which have guided the choice of the collection method. Pottery fragments are
in general considerably abraded, pointing to a long-term displacement processes, and a very small number
of diagnostic pieces were identified.

The feature and structure recording, on the other hand, proved to be a more demanding activity, but
offering a range of new information on the site. Faced with the situation that much of the remains will be
erased after another tourist season, we attempted to trace all possible remains, from the stone foundations
to tiny specks of mortar and dents and grooves in the bedrock. The technique of field recording relied on
coarsely rectified balloon photographs that were taken from a height of some 15-20 m in December 2007.
This served as a site plan on which all the recorded features were located, as well as orientation for the
layout of a 5x5 collection grid. Each structure was then vertically photographed in order to produce a
rectified raster map overlay. In the end all photographs were georeferenced using EDM points, usually
four or five per image. The EDM survey, then, also served as a more accurate reference for the
rectification of the balloon photographs. This technique provided solid accuracy for most of the recorded
structures but still contains errors in the balloon photographs which may amount to more than 20 cm in
areas far from the control points.

For each structure a short form was also available, enabling descriptive entries about the technique of
construction and the state of preservation of the wall, as well as other descriptive remarks. The written
recording was deliberately simplified and organized into typified classes in order to enable easier
comparison across the entire surface of the site, for instance tracing Roman period structures or different
preservation areas.

Small artifacts
The results of the surface collection are presented in Figure 93. Very few prehistoric finds was identified,
mostly by their typical grog-tempered fabric. The occurrence of these finds cannot be interpreted because
of the very small quantity which may be significantly influenced by random post-depositional processes.
We have been unable to distinguish the supposed Late Iron Age phase with certainty because of the
marked similarity in coarse pottery fabrics to the early medieval period, as already observed on Sv. Petar.
Only one fragment may belong to this phase: a part of a bottom of a coarse, quartz- or mica-tempered pot,
decorated with dense, fluted grooves (Figure 92, bottom right). A possible parallel can be found in La
Téne pottery from Orišje near Bosiljevo (Karlovac region) (Čataj 2007, 223, fig. 19), and from the
Golubinjača cave near Kosinj (Lika region) (Drechsler-Bižić 1970, T 5: 9, 11). The rest of the prehistoric
pottery mostly belongs to the characteristic grog-tempered ware (see Ch. 9.2.2). The largest quantity of
material can be attributed to the Roman period (first to fifth century). Quite a large proportion of the
material consists of amphorae fragments, especially when expressed in terms of the overall weight of collected materials. This is typical for the Roman period in Istria, but may hint at the commercial character of the Roman Sipar as well. Later Roman and early medieval materials are difficult to distinguish from each other solely on the basis of fabric, so we have probably mis-classified a certain amount of this material. The distribution of finds shows some difference from the Roman period in the south-eastern sector and is comparable to the situation from the medieval phase. The distribution of iron finds (nails, amorphous bits, and possible slag) also corresponds more to medieval and Late Roman distributions than to the earlier ones.

Figure 92 A selection of pottery finds from Sipar.

Structures
Based on the shape of the stones and mortar used, two basic types of masonry were identified. The older one, dated broadly to the Roman period (first to fifth century) is characterised by triangular-shaped stones and pale gray to yellow mortar made with fine sand and some crushed ceramics. Pale pink coloured mortar containing a higher proportion of crushed pottery can be seen on Roman ponds (Figure 96: 15-18) as well. The majority of architectural remains were dated to the Byzantine period. This phase is recognisable by a technique that sometimes uses large amounts of mortar, usually pink to reddish in colour, and often contains large amounts of medium to coarse gravel and crushed ceramics. The stone used tends to be less sharp on the edges and on average more prismatic. Walls erected with more care sometimes have a larger quantity of flatter, slab-like stone than usual. It should be noted that the recorded walls are mostly preserved in their foundation sections, usually only the first row of stone, so they probably do not emulate the technique of the overground parts. Walls without mortar were classified
by stone shape. This simplified schema surely does not reflect the complexity of the site, as for instance the medieval phase has not been identified with certainty by our team.

Figure 93 Sipar: gridded finds collection.
11. STRUCTURAL SURVEY OF THE SIPAR PROMONTORY
11. STRUCTURAL SURVEY OF THE SIPAR PROMONTORY

Figure 94  Structural survey plan of Sipar.

Figure 95  Some types of masonry on Sipar: a) grey to pink mortared Roman, b) red mortared late Roman, c) unidentified coarse masonry.

The masonry of the large building with pillars in the interior (46-49), and two ponds carved into the bedrock (15-18), can be attributed to the Roman phase. The large building was interpreted as a horreum and attributed to a Late Roman castrum (sixth to seventh century) by Mlakar and Marušić (Marušić 1975, 339). What should be noted is that the buttresses are placed inside rather than outside of the building, as is usual in such structures (e.g. Matijašić 1998, 270), and that the building was apparently single-storied, wide, and low. These features correspond better to the basilical type of warehouse than the tall, thick-walled Roman horrea (e.g. warehouses from Rim near Roč, dated to the fourth to fifth century (Matijašić 1998, 283), and Sorna near Poreč (idem, 281). As far as the building’s dating is concerned, we also have some stratigraphic information at hand. The multi-naved building is overlaid by a Byzantine wall (43) and a very rough stone pavement in the western part (Figure 95). This information is not enough to establish firm dates of construction and dismantling, but does indicate that the structure might have been older than the predominant red-mortared Late Roman phase. Judging by the different construction
technique, as well as by the quantity of the Roman material in the collected pottery assemblage, we suggest a dating in the range between the first and the fifth century.

Figure 96 Square pillar overlaid with very coarse pavement.

Two ponds have survived due to being carved into the bedrock and are today almost completely buried, leaving only small bits of masonry visible. It seems that large portions of their sides were covered with solid masonry, creating smooth walled surfaces. The western one also has a crude channel cut along a natural fissure in the rock. We are not able to interpret these finds in terms of their function. Basins are otherwise characteristic features of *fullonicae*, wool processing facilities, such as the one in Verige Bay on Brijuni islands (Begović-Dvoržak and Dvoržak-Schrunk 2005). The proximity of the sea was beneficial for stabilising dye (*idem*, 137). However, facilities for heating water, stocking, as well as traces of dying pigment (e.g. murex shells), should be attested in order to confirm this hypothesis.
The Byzantine (Late Roman) phase is the best preserved on Sipar. It includes the majority of masonry structures, as well as the remnants of the entrance tower and a portion of a thick defence wall on the entrance side. A longer section of the rampart (54) was exposed by the 2008 storm near the entrance tower. It is 1.8 m thick, built with a large amount of reddish plaster, using larger stones only sporadically in the first row of the foundation while in general built of rather moderate-sized, roughly shaped stone. A small channel for water drainage is clearly visible. The southern counterpart of the ramparts is still standing to a considerable height and is 2.2 to 2.5 m thick. The tower ensemble was not surveyed by our team because it is less endangered than the rest of the site and was left for the next season. The exact plan of the tower is not clear, but it was probably based on a polygonal schema, while in the interior there was a solid built cistern which was also exposed by the 2008 storm.

The main part of the settlement is apparently organised on a roughly orthogonal layout with room entrances opening onto narrow passages, i.e. streets. It seems probable that the outer row of rooms was set against the ramparts, but no solid evidence to support the idea was observed (33?). An interesting feature of this, or, less likely, the medieval phase, is a trace of rough pavement of vertically set stone plates, which is preserved inside depressions in the bedrock, and which overlays the multi-nave Roman building (Figure 96: 50, Figure 95). On some spots remains of mortar used in its construction are still visible. This find, along with the course of walls 38 and 53, implies that the tower was not separated from the main settlement, but rather incorporated in an elongated layout of the stronghold.

Based on the excavation in the 1960s, Marušić described Late Roman Sipar as having a U-shaped layout, with rooms opening on the coastal sides. This description is very ambiguous and can be read as if the castrum was completely undefended from the sea side. The problem is that any trace of a possible rampart has been completely eradicated. In order to cope with the issue of the missing defence wall we have attempted to map all possible clues on the site, in the first place specks of mortar and grooves or dents in the bedrock. A certain pattern did appear, but much less then is necessary for reaching any firm conclusion (see Figure 96). On the western tip of the peninsula a series of broad grooves can still be seen, implying some construction, but no traces of mortar or stone were found. This feature is correlated to a larger surface apparently cleared of the top layer of bedrock. On that occasion, large rocks were hauled over seaward, to the area adjacent to wall 4. It is impossible to date these actions. On the north-western edge of the site some remains of massive construction are also visible, together with several pieces of an olive press, used as spolia, and a massive stone slab set vertically into a fissure (a-c). The use of spolia is very common in the Late Roman period, as exemplified by a stele walled-in into the entrance tower of Sipar, but still no stone or mortar are present. Specks of mortar with gravel additions do appear sporadically, but not obviously correlated with the line of rock grooves.
What the recorded situation implies is not an absence of fortification in the Late Roman era, but rather very thorough stone recycling. This may have been facilitated by the accessibility of the site by boat, particularly the north-western tip. Larger pieces like the spolia were pushed aside and the more suitable stone collected. Scattered remains were soon after washed away by the sea. However, the destructive force of the sea should also not be underestimated. The entire wall may have perished in the course of time, although we would expect better-preserved tracts in the more sheltered locations. Finally, the third possibility is on-site reuse of the material in the Middle Ages, when the older structures were no longer appropriate (perhaps due to sea level rise).

Conclusion

Only a very brief campaign has been made on Sipar and in spite of its diversity, the data obtained is apparently far from sufficient for providing a coherent image of the site development. Therefore, no more than a short summary can be made at this moment.

The prehistoric phase, which was ill-defined prior to our survey, has not been cleared up. The Late Iron Age period identified by previous researchers was not observed with any great certainty, while some possibly older finds emerged as well. The pottery sample is insufficient for any assessment, as only one piece has been typologically dated.

Regarding the Roman phase on Sipar, it stands in stark contrast to the neighbouring *villa* in Tiola-Katoro and Zambratija. Here only production/stocking facilities are present, along with a quantity of amphorae. Whether this reflects a genuine difference in the function of the site, or is only a feature of site preservation, remains to be seen.

In the Byzantine era Sipar belonged to an elaborate system of small and large fortresses built along the eastern Adriatic coast in order to secure seafaring to northern Italy and Istria (Marušić 1986). Although the site is severely deteriorated, we have gathered some evidence of the existence of the rampart around the settlement, in contrast to the previous interpretation of J. Marušić. The exact course or details of the structure (towers, entrances, etc.) are no longer visible.

The medieval phase was not observed in the structural remains. Perhaps some minor modifications done in very coarse masonry, without traces of mortar, can be attributed to this period. Sea level rise should also be taken into consideration, and it is also possible that the younger phases of settlement retreated to the elevated, central part of the site. Settlement subsequent to the major destruction in 879 was not recorded. However, a more detailed analysis of gathered material may also clear up this problem.
12. CONCLUSION

The application of methods of landscape archaeology in the study area of Bujština, systematic field survey in particular, has enabled us to discuss a range of topics. In order to assess the effectiveness of survey methodology, as well as of the landscape approach in general, we have analysed the recovery success of the Umag Field Survey, applied several simple methods of spatial analysis, and discussed the results of the survey in a wider historical context.

As can be expected, there is a close link between the field methods applied and the quality of the recovered dataset. However, this link is also related to the nature of the surface archaeological record in terms of its preservation and the cultural practices of past societies. We have demonstrated that particular archaeological periods have different imprints on the landscape, so that different methodologies should be considered for particular research topics, rather than a global, uniform approach. For instance, the Roman period can be safely researched with a more extensive field technique than prehistory, as demonstrated by the quantitative analysis of survey results, but on the other hand it may be more demanding in terms of site-based data collection. In the case of the Bronze Age, it has proven very useful to supplement systematic field survey with an intensive feature survey of the hillfort sites, which are the key for understanding the complex landscape pattern.

The Umag Field Survey project has produced a range of new data which are interesting in their own terms. We wish to stress, however, several issues that are also relevant in terms of the specific contribution of the landscape approach.

In the context of the Bronze-Iron Ages we have attempted to reassess several traditional assumptions which all revolve around the proper understanding of the prehistoric settlement pattern, for instance the idea of the centrality of the hillfort sites and the related nucleation of settlement in them. The image that emerged using the Umag survey data is rather incomplete and is heavily biased toward the earlier phase of the so-called hillfort landscape (*sensu* Novaković 2001). We have interpreted the recorded data as reflecting the pivotal position of at least one hillfort (Kaštelir) in the overall organisation of human activities. This was possible due to the integration of a detailed systematic survey of the hillfort surroundings with a feature survey of the hillfort interior. However, there are many indications that the nucleation of settlement inside the Bujština hillforts is a later phenomenon (advanced Bronze-Iron Age). This has been demonstrated by the analysis of the sub-hillfort settlement, as defined in this thesis, which
seems to indicate gradual clustering of settlement in the direction of the hillfort. Therefore, a distinction should be made between a pivotal position in the settlement pattern, which we consider in the first place in spatial terms, and centrality as a complex trait of social organisation. In fact, for at least one hillfort, Glavica on the Markocija plateau, we hypothesise that it may have been a sporadically used focal point of a wider portion of scattered Bronze Age settlement. Furthermore, when considered in the wider perspective of other Istrian Bronze Age sites, the Umag survey data indicates that the hillfort phenomenon may be subsequent or at least parallel to the significant increase in the density of open-air settlement.

The Roman period has left a vast amount of archaeological traces in the Bujština landscape and lends itself ideally to the systematic survey approach. The dataset recovered has enabled demonstration of several simple methods of spatial analysis, which have been deployed in order to reach historical explanations. A communication route has been proposed in the surveyed area, based on the settlement pattern recorded by the survey. The spatial relationship of two basic types of Roman sites (small and big) has been interpreted in terms of hierarchical organisation, where the smaller sites represent facilities related to the bigger ones. The latter in some cases appear to be typical villa rusticae. We have also attempted to embark on the discussion of the average property size and possibilities of its assessment using field survey data. As in the case of prehistoric settlement of western Bujština, Roman data fits only loosely into the previous historical models. For instance, the presence of epigraphically attested large imperial and senatorial estates is not visible in the recovered settlement pattern in the Umag hinterland, which seems to correspond better to a set of medium-sized agricultural properties.

Special attention has been paid to typical issues in landscape archaeology, such as the relationship between the natural environment and the cultural pattern, and the interpretation of the off-site assemblages. Systematic survey of karstic dolinas was included in the research design of the 2008 season and has provided some valuable insights, although the surveyed sample is too small for discussing any specific spatial patterns. Off-site assemblages were recorded with varying success in the 2007 and 2008 seasons, but the dataset still enabled certain conclusions about the possible cultural patterns that have produced the off-site artefact distributions. For instance, based on the overall composition of the off-site assemblage recorded in the 2008 season we have argued that manuring may not be the appropriate explanation of the recovered pattern. Probably the off-site assemblage is to a large part comprised of deteriorated small sites and material used for paving paths.

The diversity and the interpretative potential of the Umag survey results eliminate the need for further arguments in favour of the landscape approach. Apologies of that kind are frequent in the field
survey literature anyway. It may be more constructive to concentrate on the problems encountered in the application of the landscape research in our case study.

The standard problem of field survey projects is data quality (Cherry 1983: 379: “Ambiguity is a common feature of most sets of survey data”). Basically it can be regarded as a series of compromises between:

- the envisaged scientific outcomes of the project
- the choice of the study area with its particular archaeological record
- the choice of field methodology
- the responsibilities with regard to heritage management and protection

The Umag survey has also shown acute problems in this respect. The analysis of the Roman period is severely hampered because of the scarcity of the collected artefacts, so that intensive data collection from Roman sites has to be made in the future. The geophysical prospection made in 2009 is, in fact, a good start in this direction. The prehistoric period is even more problematic and perhaps it should be carefully considered whether any significant improvement in the data quality is attainable by even further increase of survey intensity, or whether a different methodology should be applied.

An important question is whether the Umag survey succeeded in producing a coherent account of the development of the western Bujština landscape. Aside from the small size of the studied area (the project is still in its beginnings), it seems that the problem is in the field survey approach as well. Genuine diachronic patterns that can be expected regarding the known history of the area did not emerge, and the finds tend to cluster into three periods, Bronze-Iron Age, Roman, and post-medieval. It seems that different types of social organisation leave different imprints on the soil and that the idea that it is possible to reveal the “total archaeology” of an area with an ideal field survey method is an illusion. In fact, field survey should be regarded as a particular method of the landscape approach. A good example is the medieval period, which is very poorly represented in the Umag survey dataset, even if the relative prosperity of the Umag commune and surrounding settlements is well-attested from historical sources. However, the “missed” medieval countryside may be discerned by an analysis of field systems that are visible on recent maps and areal imagery of the Umag hinterlands. This type of study would provide a markedly different account of the evolution of the Bujština landscape.

Furthermore, field survey is also very problematic in terms of the specific requirements with regard to the visibility and composition of the surface archaeological record. In most cases systematic survey is useful only for the study of ploughsoil assemblages, and is thus directly related to modern agricultural preferences. This problem has emerged in the context of the Roman period in the surveyed area in the
Umag hinterland. The area is covered in *terra rossa*, intensively cultivated today, and may provide only a very specific detail of the wider Bujština region. It is most likely that the Romans also preferred the flat *terra rossa* plain, but this cannot be fully assessed without further research in other parts of Bujština.

In the end we can conclude that the Umag survey project has provided a good platform for testing the landscape approach. Once more we would like to point to the illusion of the possibility of “total” landscape archaeology. Field survey is a specific method which can yield the best results in combination with other, complementary approaches. J. Bintliff refers to this notion as “cumulative credibility”, more specifically as the combination of field survey, excavation, and the historical approach (Bintliff 2000, 214). The Umag survey also demonstrates that a degree of eclecticism may provide a healthy counterbalance to sometimes excessively systematic field methodologies.