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Legacies of Change: the Shaping of Cultural Landscapes in a Marginal Mediterranean Mountain Range, the Garraf Massif, North-Eastern Spain

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Summary

Human conceptions of landscape have influenced the shaping of landscapes as much as landscape configurations have modelled human perceptions. In this article a new theoretical approach to long-term cumulative landscape change is tested on the Garraf Massif (Baix Llobregat, north-eastern Spain). Thanks to its ancient occupation, physical character and location near to the city of Barcelona, the area provides a good illustration of how human-induced landscape change has shaped new, and sometimes conflicting, landscape perceptions. These perceptions then play an equally active role in altering the previously 'inherited landscape' in a long-term cyclical process that can be studied through the combined use of historical, palaeoenvironmental and archaeological records.

Introduction

The shaping of cultural landscapes has been studied by adopting many theoretical approaches. Thus, the human factor has generally been acknowledged as being a primary agent of landscape change during the Holocene (Astill and Grant 1988; Walsh *et al.* 1995; Roberts 1998; Lewis 1999), while, conversely, natural processes in many instances have also been identified as determining socio-cultural changes (de Menocal 2001; Hodell *et al.* 2001; Wilkinson 1997). Numerous studies, however, have shown these processes to be twofold in nature, acknowledging the dual and reciprocal interaction between humans and the environment they inhabit synchronically and diachronically (Walsh 1999; Christie *et al.* 2004; Ayala and French 2005; Fletcher and Dunn 1999; Dunning *et al.* 1999). Recent approaches have also shown human perceptions to be a primary driving force in the shaping of past landscapes (Ingold 1993; Darvill 1997). Here, we are concerned with anthropogenic physical landscape changes and the role that people's landscape conceptions have played in the development of human-environment relations through time.

Landscape change is, at times, irreversible. Some human activities, such as intense herding or farming activities, quarrying or mining, can involve processes of major vegetation change, erosion or the loss of soil nutrients that are very difficult, if not impossible, to reverse (Roberts 1998; Thornes 1987; Roberts *et al.* 2001). These permanent physical 'scars' left on the landscape influence both future land uses and cultural landscape perceptions. In this sense, every generation incorporates in its own conception the use that previous generations made of the landscape. A cumulative landscape change approach is proposed in this article in an attempt at relating physical landscape modifications to changes in people's perceptions and vice versa in the shaping of cultural landscapes.

Marginal landscapes are thought to be the most valuable areas for the application of such an approach. They have known ecological, economic and socio-political constraints (Young and Simmonds 1999) that help to highlight the characterization of different socio-cultural perceptions and the use of these landscapes.

Mountainous areas have frequently been typified as marginal (Christie *et al.* 2004, 2; Walsh 2005, 289). Several ecological factors, such as their pronounced

steepness, low quality soils or constraining topography, have played an active role in the creation of such a characterization. Water supply can also be a major constraint when dealing with Mediterranean calcareous ranges. Marginal mountain landscapes house multiple human uses and perceptions (including illegal/legal, stable settlement/mobility, productive/unproductive) and so present an excellent stage on which to assess the different human conceptions of landscape and their role in the shaping of these areas. Furthermore, mountain environments are highly sensitive to human impact (especially erosive processes), as the results are very visible. A more exhaustive analysis of the means by which modified landscapes influence the creation of new landscape perceptions is therefore possible in these areas.

Below, a 'marginal' upland Spanish landscape is analysed from a long-term perspective to examine the benefits of applying a cumulative landscape change approach to our understanding of anthropogenic landscapes. We also investigate the capacity of the archaeological record to reflect differences in past landscape conceptions.

Geographical setting

The Garraf Massif (Baix Llobregat, north-eastern Spain) is a mountainous coastal region which has been designated a Natural Park. Centuries of uninterrupted human occupation together with frequent wild fires have transformed this Mediterranean calcareous and highly karstified massif into an eroded landscape in which dense shrub vegetation is found only in the lower valleys. Even though the Garraf Massif lies close to the densely populated city of Barcelona, visitors to the park are rare. This case study concentrated on a small upland zone of around 8 sq km at a height of *c*.600 m a.s.l. located within the Begues district (Fig. 1). Lack of water, highly precipitous slopes, and dramatic erosive processes characterize the extreme natural setting of the study area. This area was selected both for its present marginal character and its complex prehistoric and historic dynamics.

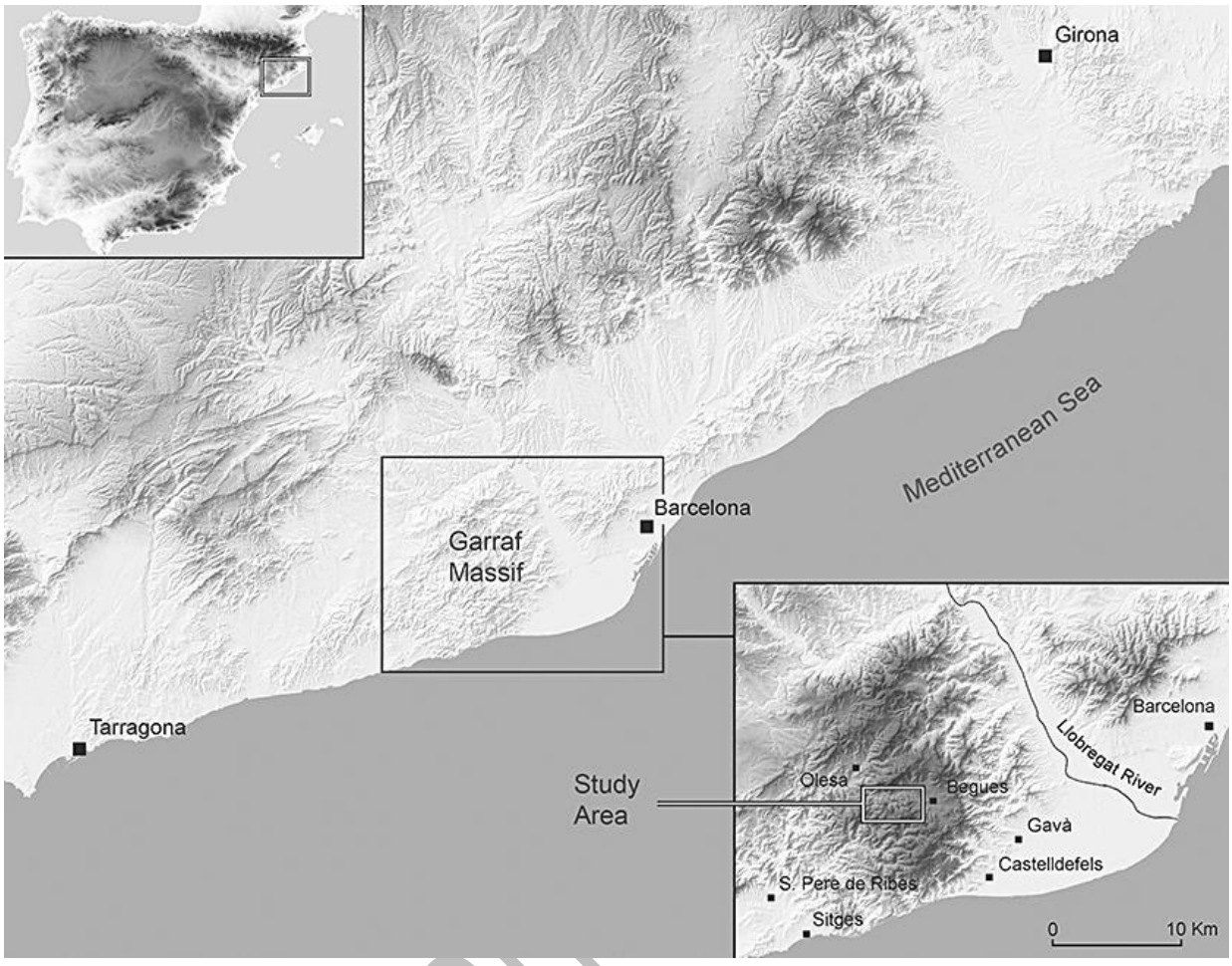

Figure 1.
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Map showing the location of the Catalan coast within Spain, the Garraf Massif and the study area.

Methods and techniques

Prior to our investigation no archaeological fieldwork had been undertaken in the selected study area. Locating structures in the landscape was therefore of prime importance in order to get a preliminary account of past human activities and land use patterns.

The use of aerial photography and historic cartography has been extensive in the location of pathways and visible structures. Aerial orthophotography from the 1950s to the present day was essential in planning the fieldwork. Orthophotography analysis was also employed to assess the extent of the major physical changes produced in the area from the 1960s onwards. Maps dating from the end of the eighteenth century to the present were also consulted.

An extensive field survey was carried out in the study area by a team of professional archaeologists. The aim of this exercise was to analyse the structures that had been previously located in aerial photographs and maps, as well as to record new ones. As a result, 44 different archaeological structures (farmhouses, corrals, shelters, cisterns, enclosures, stock routes, etc.) were identified. Intensive

surveying combined with artefact recovery was not feasible owing to extreme soil erosion on the mountain ridges and the presence of very dense Mediterranean *macchia* in the valleys. Consultation of Catalonia's sites and monuments record provided an up-to-date image of the archaeology in the study area surroundings.

GIS and database systems were employed to integrate information collected from aerial photography, cartography, and the field survey. GIS was also invaluable in informing us about our interpretative hypothesis. By tracing least-cost routes between sites it was possible to predict the location of ancient, but long since disappeared, pathways linking visible archaeological sites (Orengo and Ejarque 2008, 82–3; Orengo *et al.* 2008, 93–4).

Once the structures had been located, we attempted to date them. Historical documentation, together with old maps, provided the most precise relative dating available to us (mostly *antequem*). Typological affinities also provided a means of ascribing date to the surveyed structures. Toponymic analysis was used to relate names appearing on dated historical documents to the structures recorded in the field.

In order to chart changing human perceptions of the landscape of the study area, the use of written documentation provided important insights into the social and cultural phenomena underpinning landscape conceptions. Present and past human perceptions cannot be restricted to an 8 sq km area since the meaning ascribed to landscapes is built upon broader symbolic scales (Darvill 1997). For this reason, historical and archaeological data available at the regional scale were also considered.

Equally, a number of environmental changes have occurred at the regional scale. In this sense, palynological (Riera 2003; Riera *et al.* 2004), charcoal (Ros 1985; 1992), and faunal (Edo *et al.* 1986) studies carried out within the Garraf Massif and related areas were selected in order to obtain an approximate image of the environmental evolution and human impact on the study area through time.

Phasing the landscape

Phases are used in archaeological interpretation to divide long-term processes. This ensures a more accessible approach and provides a better understanding of change in the archaeological record. Phases span time frames within which one category selected from the existing record remains unchanged. In our research, the defining category employed to subdivide the phases chronologically was that of landscape perceptions held by the area's inhabitants.

Precedents (Neolithic–late Roman)

No settlements were found in the case study area despite the fact that neighbouring areas had been inhabited since the Early Neolithic. The importance of sheep and goat herding activities has been reported at the Can Sadurní cave for the Neolithic through to the Roman period (Edo *et al.* 1986, 35). Regional palynological records (Riera 2003) and local and regional charcoal analyses from

caves (Ros 1985; 1992; Allué 2002) tell of a process of forest degradation affecting the Garraf Massif throughout this broad period. Human activity (agricultural and livestock grazing) has been acknowledged as an important driving force in this process (Riera 2003; 2005; Riera and Esteban 1994).

In support of this hypothesis, discussion has centred on the cultural and chronological ascription of large drystone enclosures found on some of the Garraf's ridges. They have generally been regarded as medieval stock enclosures (Miret and Miret 1981; Miret 1999, 47). However, ceramics from the seventh century BC have been excavated at one of them, suggesting the possible earlier development and use of these structures (Cebrià*et al.* 2003, 315–16). Two enclosures are significant for our research: Puig de la Mola (2.29 ha) and Marge del Moro (3.9 ha) (Fig. 2). Even though no excavations have been carried out on them, preliminary surveys at Puig de la Mola have revealed Iberian ceramics (Miret and Miret 1981, 190–1). If the proposed earlier development of these enclosures is accepted, then we are looking at the existence of important livestock economies in the study area and its surroundings during the Iberian period (sixth–first centuries BC). By this time, Iberian settlements are well documented across the Garraf Massif (Miret 2003).

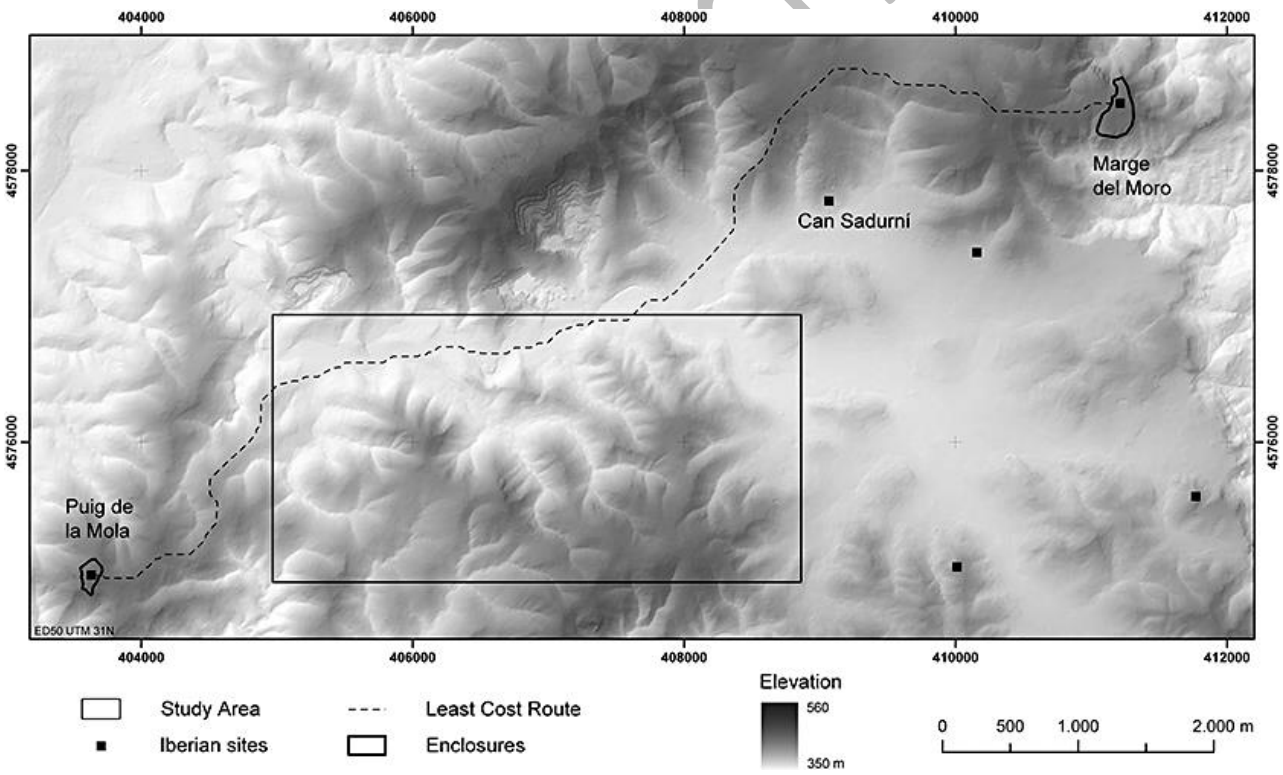

Figure 2.
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Map of the study area showing the location of the documented Iberian sites, the drystone enclosures and the least cost route between them.

The proximity of the enclosures to Iberian occupation sites, together with their link to transit routes (documented in medieval times as transhumance routes), suggests simultaneous and complementary use. GIS least-cost route analysis between the Puig de la Mola and Marge del Moro enclosures was carried out to

determine whether the study area might have been involved in these pastoral dynamics. The resulting route did not just cross the study area but coincided with medieval and modern livestock transit routes (Fig. 2). Accordingly, it would seem that this area might well have been heavily traversed and integrated within a regional and local herding management at this early stage (sixth–first centuries BC).

First phase, sixth–tenth centuries AD

This phase saw a major landscape transformation of the whole central Catalonian coast. The increasing use of fires to open up forested areas for livestock grazing resulted in significant erosion to the mountain ridges of the Garraf Massif (Riera 2000, 99–101; 2003, 308; 2005), while the impact of sheep and goat herding on erosive processes has already been stressed (Thornes 1987; Shiel 1999). These general erosive processes played a key role in the shaping of the Catalonian coast through secondary sedimentary accumulation (Riera and Palet 1993; Palet 1997, 48–9). Human activities and subsequent erosive processes contributed to the formation of a different landscape in the Garraf Massif. This was a landscape in which the hills were gradually worn away and soil accumulated in the valleys. Such processes were important for the future perception and use of the Garraf Massif upland areas.

Before the tenth century various populated centres are documented around the study area. A Muslim document from 898 gives evidence of a battle between Muslim and Christian troops *en route* to Barcelona at a place known as *Bigash*. According to Miret (2000, 60) and Campmany (2000, 196), this Muslim toponym refers to modern-day Begues. The Muslim castle of Alcalá was also documented before the year 911 in Sant Boi del Llobregat. These two Muslim centres were connected by a path crossing our study area which was later known as the 'Barcelona Way' (Fig. 3) and which is historically documented in the thirteenth century (Miret 2000, 60).

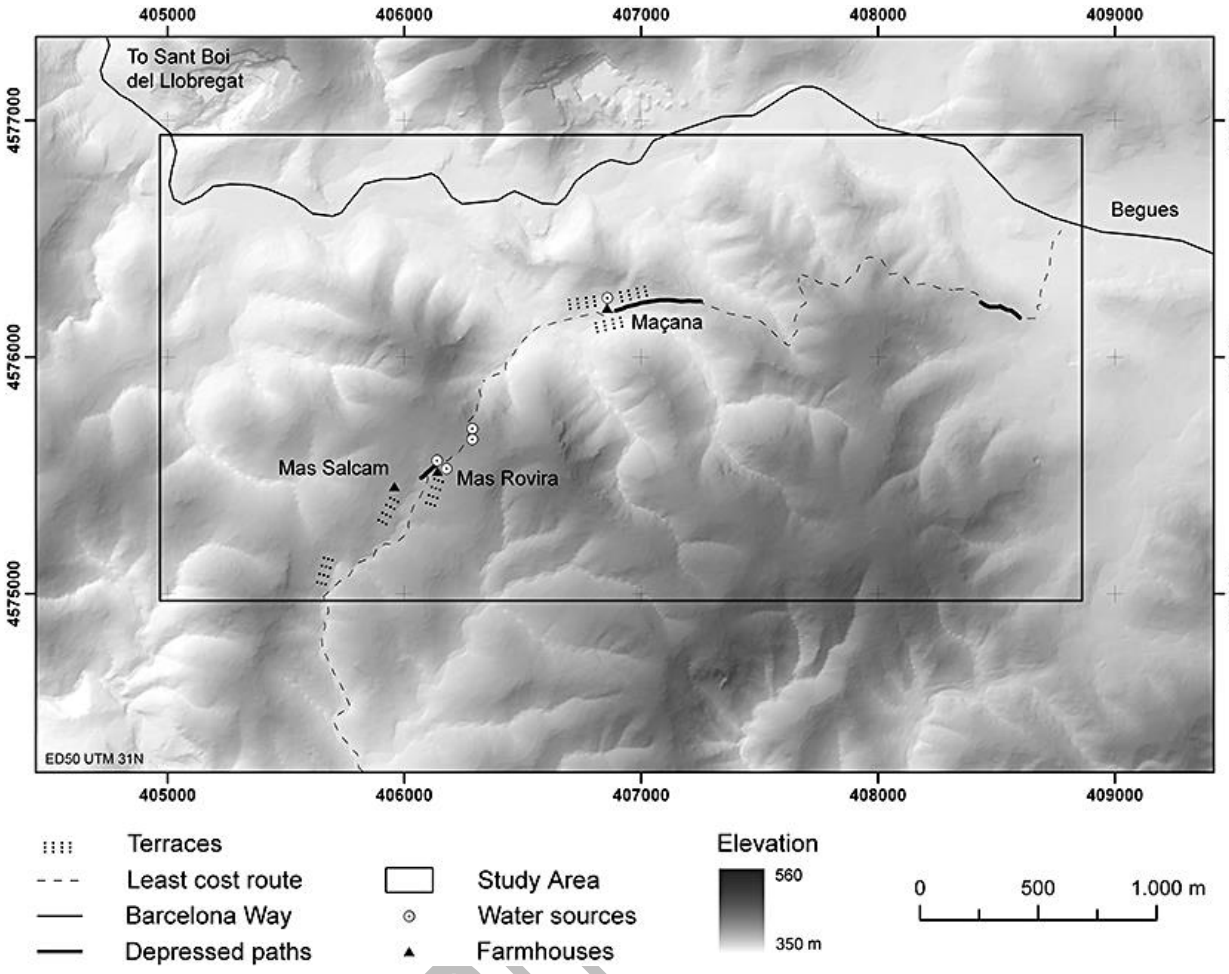

Figure 3.
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Map showing the recorded structures belonging to the second phase.

At this time, the study area has to be understood in terms of these routes that ran between, and linked up, populations. There are no stable settlements documented in the landscape; it is the movement between places and the length of time spent on the road which give the landscape a human dimension. This pattern is consistent with regional archaeological data from the Garraf Massif, where sparse occupation is recorded during the Muslim period (eighth–ninth centuries) (Miret 2003). However, historical accounts provide invaluable insights into the social perception of this territory. At this time, the Garraf Massif was the frontier between Muslim and Christian populations. This frontier was not clearly established but rather constantly shifting (Campmany 2000) and the massif was regarded as no man's land. In this troubled zone, conflict acted as a constraint on stable settlement and the safest activities were, in all likelihood, those that involved movement; hence, the importance attached to livestock herding in this area, an activity that is recorded in the pollen record during this phase (Riera 2003). In this sense, it is interesting to note from Pyrenean ethnographic accounts (Ros 2004, 33) that transhumance activities seem to have benefited in wartime and during unstable periods.

Second phase, tenth–fifteenth centuries AD

During the tenth century Christians dominated the Garraf Massif, leading to an important reorganization of the Garraf lands (Campmany 2000, 193). Christian authorities and nobility promoted the occupation of this newly conquered land through the so-called *aprisionadors* movement, granting economic and social advantages to colonizing farmers. As a consequence, stable, dispersed farmhouses with their associated corrals and cultivated areas developed within the Begues district.

This process is documented archaeologically in the study area. Field survey records a drystone structure in the Rovirós gully. Typologically, it corresponds in plan to a tenth century farmhouse, described by Sanahuja (2001, 42) and further documented by examples from Riu's work at Mas de la Creu de Pedra (2001, 30).

The 1390–6 *capbreu*[1] records the existence of an already abandoned farmhouse known as Mas Rovira (Fig. 3). The original farmhouse could have given its name to the Rovirós gully and it might be related to the structure documented there through field-walking. In 1341 and the years that followed, the Black Death led to a marked demographic crisis in the area (Solans and Bondia 2001, 20–1), as is shown by the 1358 *fogatge*,[2] which records only three households within the Begues district (Pons 1964, 111). These events may be related to the disappearance of Mas Rovira and the construction, towards the end of the century, of new farmhouses such as Mas Salcam and la Maçana, both of which are first documented in the 1390–6 *capbreu*. These were both archaeologically documented through field survey: Mas Salcam is a typical livestock setting with corrals, while la Maçana survived longer, undergoing an eighteenth century rebuilding of the original fourteenth century structure. Toponymic evidence links these field-documented structures to the historical *capbreus*.

The location of these farmhouses was carefully chosen, linked to the natural pathways connecting the inhabited settlements. Predictive pathway modelling was used to draw the least-cost route between those settlements closest to the surveyed area. All documented farmhouses were closely linked to the predicted route. The field survey, whose aim it was to locate these routes, gave positive results with traces of these paths being found in the form of three depressed stretches (Fig. 3). It is difficult, however, to be precise as to which came first, the pathways or the farmhouses. What is undeniable is the close relationship that existed between them; as Ingold states, 'there can be no places without paths [. . .] and no paths without places' (1993, 167).

Sparse dispersed farmhouses constituted the general settlement pattern at this time in the massif as they would also in future phases. Farmhouses tended to be located in low-lying areas where the soil had accumulated from previous erosive phases and water availability was higher. Mountainsides were cultivated as a result of agricultural terracing, but livestock herding was clearly dominant. These long-term inhabited areas had limited resources and each farmhouse was therefore located in a different valley. Paths linking these settlements were densely lined with structures for communal use such as pathways, water cisterns, pools

and enclosures. This web of communication structured the landscape, just as it structured the way in which people perceived it.

Third phase, sixteenth–nineteenth centuries AD

During this phase the greater wealth of the historical sources, together with an increase in the archaeological remains within the study area, provides a better and more complete understanding of people's perceptions. For this reason, for the first time it has been possible to discern different, and even conflicting, conceptions of the same landscape.

The 1486 Guadalupe Edict abolished the nobility's abusive privileges over the peasant class. The new situation promoted small-scale private initiatives and, as a result, farmhouses in the surveyed area multiplied. The number of farmhouses in the Begues district rose from just five in the fifteenth century to 32 in the sixteenth century (Sanahuja 2001, 42). The study area was not exempt from this process and two of these new farmhouses (Can Térmens and Casals), as well as several isolated corrals, are documented (Fig. 4).

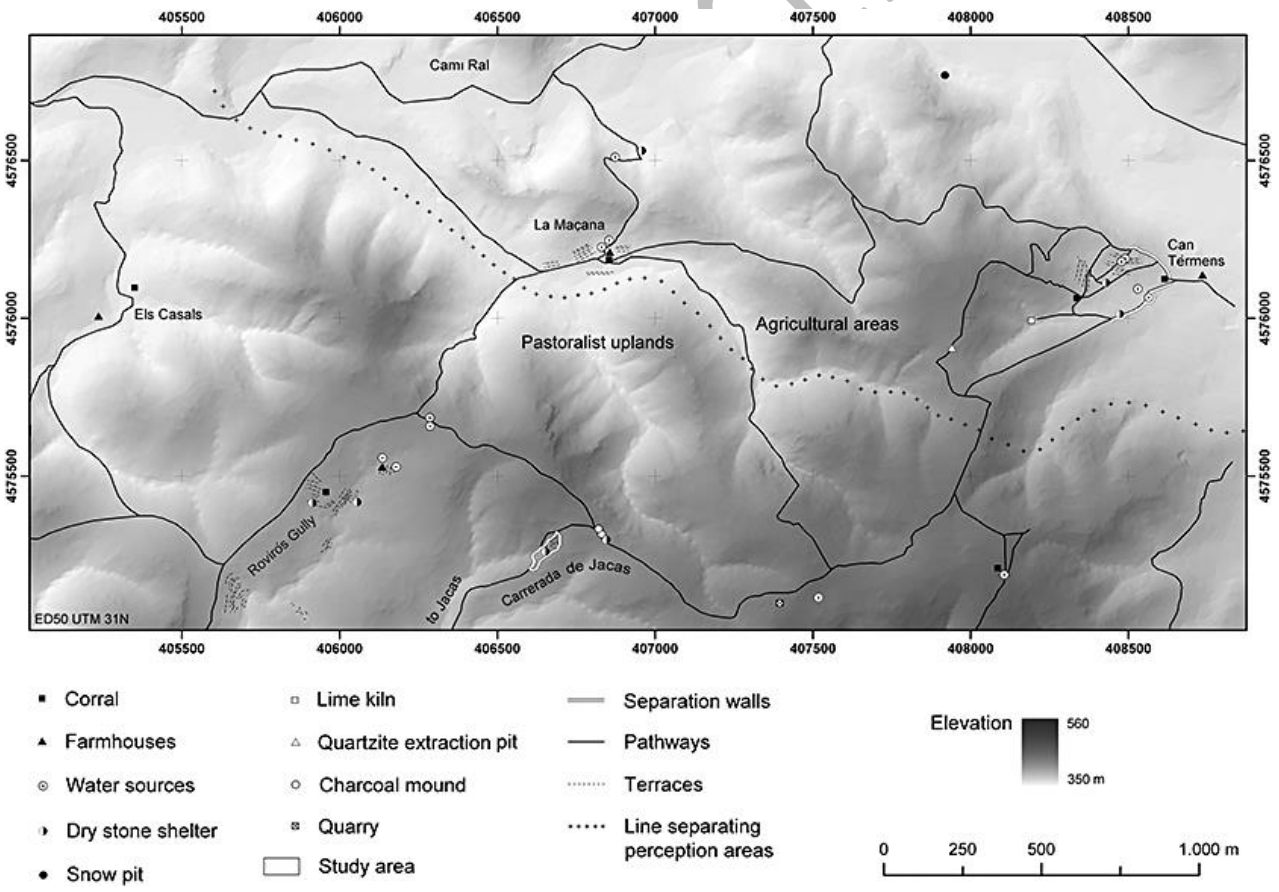

Figure 4.
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Map showing the recorded structures belonging to the third phase and the different perception areas.

In addition, historical records and archaeological fieldwork point to the exploitation of a wide range of natural resources within the study area. These activities can be related to various structures located through field survey, and include lime kilns, snow pits, stone quarries, quartzite extraction pits and charcoal mounds (Fig. 4). All these activities, together with traditional agricultural and stockbreeding practices, dramatically altered the landscape to a point from which there was no possibility of recovery. Forested areas were most affected by this process, as is shown by Francisco Zamora's questionnaire of 1789 which relates that the inhabitants of Begues 'don't take care of forests; in fact, they destroy them as soon as they can' (Codina *et al.* 1992, 83).

According to documentary and archaeological evidence, agriculture was mostly undertaken as part of a farmhouse's self-sufficiency programme within this mountainous area. A good example of this is to be found in the documented terraces of la Maçana farmhouse (Fig. 4). However, it was during the second half of the eighteenth century that wine production in Catalonia reached its peak. Many mountainous areas that had traditionally been dedicated to herding and forest management were terraced and turned over to vineyard production, as is recorded in documentary sources both in the Begues district and the study area (Solans and Bondia 2001).

Livestock herding continued to be the most important activity in this area. In 1737, Can Térmens dedicated 88 per cent of its lands to livestock-related activities (Bondia and Solans 1994). During this phase, historical accounts also record the appearance in the study area of new farmhouses and new transit routes, including the *Carrerada*[3]*de Jacas* for livestock. As a consequence, places such as the Rovirós gully were relegated to a secondary position as regards the local movement of resources.

The hiring of shepherds became common practice for farmhouse owners. However, seasonality and the instability of livestock herding activities usually forced these shepherds to complement their income with a wide range of other activities (Codina 1993, 49). Among these, activities involving transportation along transit routes and the exploitation of the mountain environments were commonly undertaken, as they could be combined with herding practices. This might explain the strong relationship that grew up between herding and banditry and which is well documented in Catalonia during the sixteenth and seventeenth centuries. There is documentary evidence that the Garraf Massif shepherds relied on banditry during periods in which work was scarce. Bandits tended to stake out pathways and strategic upland areas and, consequently, the *Camí Ral* (Royal Path)[4] was a favourite spot for their activities (Codina 1993, 47–8) (Fig. 4).

Stable settlement was linked to farming centred on plains or fertile zones, while, by contrast, a strong relationship between livestock herding activities, mobility and marginality grew up in the highlands. The physical environment is key to understanding these two contrasting ways of life within the same landscape. The uninterrupted exploitation of the mountain areas in previous phases generated a considerable movement of soil from the high areas to the plains and valleys below.

This explains why agriculture concentrated in the lowlands and why grazing activities were predominant in the upland zones.

Once again we can see how cumulative patterns of land use resulted in changing landscape perceptions. Two different perceptions, shaped by the ancient landscape, shared this contiguous physical space: mobile vs. stable; pastoralist vs. agriculturalist; marginal vs. nuclear zones. These opposing concepts and perceptions fought to impose their own view of the landscape, resulting in the creation of a truly 'contested landscape' (Bender 1992; 1993), which is equally expressed archaeologically. Field survey documents drystone walls separating herding and agricultural spaces. These 'dividing walls' were found in those areas where the worlds of the pastoralist and agriculturalist, along with their respective activities, met and clashed. These walls served, on the one hand, to isolate livestock paths as they passed through what were mainly agricultural plains and, on the other, to protect terraced areas for agriculture in the predominantly pastoral uplands (Fig. 4). It is proposed here that these dividing walls separated not just different economic activities but different landscape perceptions.

Fourth phase, twentieth–twenty-first centuries AD

With the arrival of the phylloxera plague[5] at the end of the nineteenth century, most of the Begues vineyards were destroyed. This crisis dramatically influenced the general economic dynamics of the Garraf Massif. Although only marginally dependent on agricultural production, the study area was strongly affected by these events because it was integrated within the wider economic trends of the region. Today, the abandoned terraces retain the little remaining soil on the treeless mountain slopes, but their gradual degradation will, given time, lead to fresh, massive erosive processes (Fig. 5). Twentieth century economics has rendered traditional livestock herding practices redundant. Pastoralism, as it was known, is no longer present in the Garraf Massif. The study area has been largely abandoned and none of its structures are in use, except an aerial communications station, a sewage treatment plant and an equestrian sports centre occupying the old Térmens farmyard (Fig. 6). Centuries of human exploitation have resulted in a highly eroded upland landscape. Hill wash erosion is essentially complete with very little soil still *in situ*. The bedrock is exposed and becoming increasingly splintered and fragmented, making field-walking a difficult and hazardous exercise.

Figure 5.
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Abandoned terrace in the study area showing the degradation process which will induce future erosive processes.

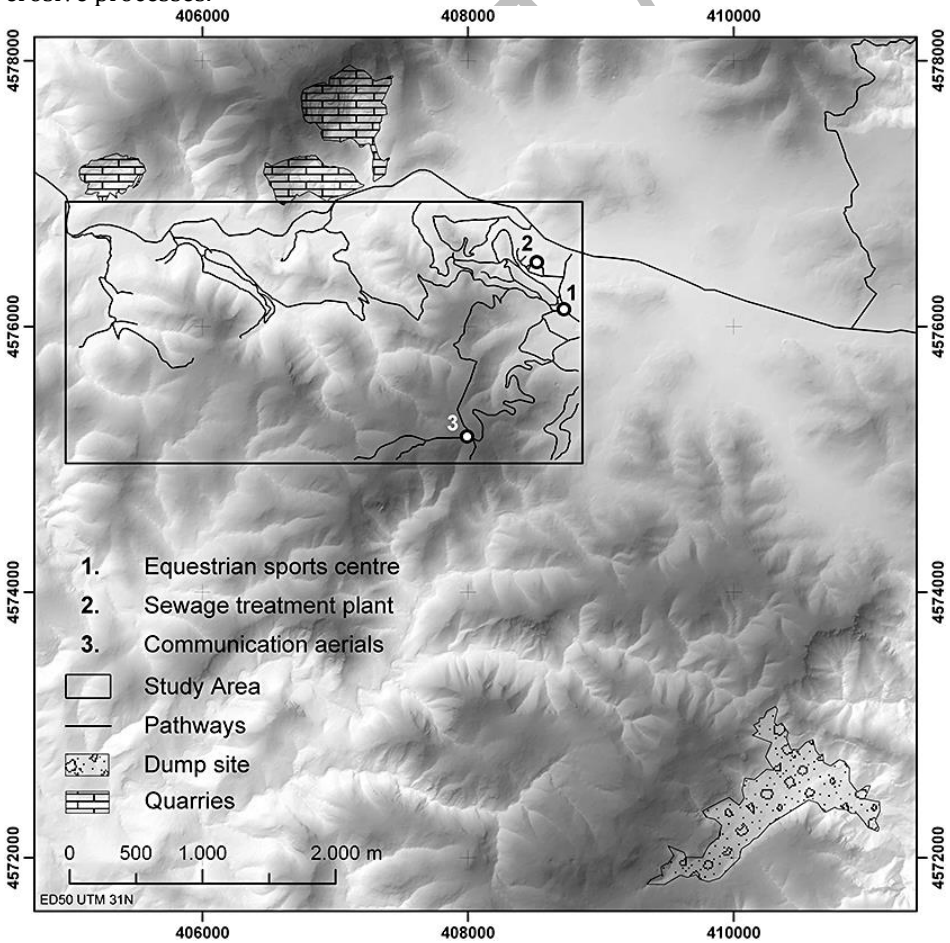

Figure 6.
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Map illustrating the study area's fourth phase.

Today, a series of activities regarded as marginal and unhealthy by modern society are being practised in the area surrounding the study zone. The quarries of Montau, which occupy an area of around 400,000 sq m, have left an indelible mark on the Begues landscape. The main Barcelona city landfill site, occupying an area of 630,000 sq m, is also in the Begues district. This gigantic site currently occupies an entire valley, with tons of rubbish being dumped daily. Reports warning against the location of a landfill site on a calcareous massif were ignored and water source pollution was soon detected (Custodio 1981).

These activities serve to underscore the modern preconception of the Garraf Massif. They promote the perception of this area and its surroundings as a marginal space from which the city of Barcelona obtains its building materials and in which it dumps its waste.

However, within modern Catalan society conflicting landscape perceptions of the Garraf Massif have once more become evident. In 1986 the Garraf Massif was declared a natural park and, since that date, many environmental projects have been set up to restore the area's ecological value and significance. In parallel, archaeologists and cultural heritage researchers hold a different conceptual view of this landscape, seeing the Garraf ranges more as a cultural than as a natural landscape. Archaeologists, together with ecologists and other scientists, are seeking to rehabilitate the landscape and are providing alternatives to the existing perceptions of the Garraf landscape, which tend to emphasize the image of a degraded and marginal space. Once again, this upland territory expresses itself as a contested landscape.

Conclusions

The relationship between human landscape perception and landscape change is a reciprocal though complex one. It depends on factors that go beyond mere quantification and the approach we propose here therefore is more of an interpretative tool than that of an explanatory model. However, a number of benefits can be derived from applying this ‘cumulative landscape change approach’ to the study area.

This article demonstrates that the combined use of documentary, palaeoenvironmental and field survey data can provide important insights into a landscape's physical modifications and people's perceptions of landscape, and the importance of this relationship in the shaping of the land. In this sense, natural erosive processes were seen to be greatly exacerbated by human action over time. In turn, future human perceptions were influenced by preceding landscape changes.

From the tenth century onwards, stable settlement and agricultural practices were, by preference, located in the fertile valley bottom, itself partly created through the

effects of earlier erosive processes. Thus, the inherited and modified landscape was incorporated into the perception of successive generations, and played an active role in the shaping of new landscapes. Obviously, human perceptions of our study area were not solely circumscribed by previous and existing physical landscape modifications; regional social and cultural processes also influenced the perception and use of this upland area. Thus, the rise and fall of stable settlement is intimately linked to the prevailing socio-political situation of the Garraf Massif. This is clearly seen during the Christian conquest (tenth century) and after the abolition of the nobility's privileges (fifteenth century) when the construction and spread of farmhouses were first recorded in the study area. In opposition to this, livestock herding activities were not so closely related to these political processes as they remained in continuous existence throughout all phases, except the last one.

During the third phase (sixteenth–nineteenth centuries), we see how opposing visions of landscape can result in the creation of contested landscapes. Prevailing landscape perceptions were reflected in the physical use of barriers and constraints which remain visible in the archaeology. During this phase, pastoral and agricultural landscape conceptions were physically separated by drystone walls, paths, and the distribution pattern of resources in this area. The archaeological survey was essential for locating and identifying this contested landscape although, evidently, not all types of contested landscapes could be documented in the field. For instance, no trace of just how bandits conceptualized the landscape can be extracted from our study.

During the last phase we see the contemporary idea of this landscape and it is this phase that best shows how the cumulative effects of landscape change have altered and fostered existing landscape perceptions. Centuries of uninterrupted human landscape modifications have created an extremely eroded landscape. The landscape of the Garraf Massif today is irreversibly exhausted. But even exhausted landscapes are still capable of creating contested perceptions. Three of these have been stressed here: the Garraf Massif as a marginal space in which pollution and destruction are legally endorsed; the Garraf Massif as a natural landscape to which biologists and environmentalists dedicate their time and expertise; and the Garraf Massif as a cultural landscape whose anthropogenic character we, as archaeologists, attempt to unravel.

To conclude, a cumulative landscape change approach provides a useful analytical framework in which the relationship between human landscape changes and the creation of new landscape perceptions is organic and is constantly reshaped through time. As societies change diachronically so do their landscapes and it is subsequent generations that have to deal with these altered inherited landscapes. Thus, every new generation adds the uses and disuses which previous generations made of the land to its own landscape perceptions. Hence, anthropogenic landscapes are better understood as ‘cultural legacies’ which physically encapsulate and preserve past human conceptions of space and place.

Acknowledgments

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Footnotes

- [1] Medieval cadastre in which the nobility recorded their obligations and properties by district.
- [2] Medieval census in which household numbers were recorded by district.
- [3] Carrerada is the Catalan name given to a livestock transit path.
- [4] Formerly known as the 'Barcelona Way'.
- [5] The phylloxera plague was introduced into Europe in the mid-nineteenth century, destroying most of the continent's vineyards.

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