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Improvements and methodological innovations in the application of the Historic Landscape Characterisation methodology to industrial heritage landscapes

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Abstract
Industrial heritage landscapes today are phenomena of extraordinary complexity, the study of which has been addressed belatedly by the scientific community in general, and to date no methodological trend has given priority to its study and management. There do exist, however, recent methodological approaches, such as Historic Landscape Characterisation, which, in recent years, have addressed the problems and opportunities presented by a wide diversity of landscapes, as is the case of the industrial landscape of Blaenavon. The aim of this article is to critically evaluate the validity of this methodology in terms of responding to the needs that these landscapes present with regard to their study, enhancement and intervention from a heritage and cultural perspective. This study concludes that, while this methodology is a valuable contribution to knowledge of the historical character of these landscapes, the importance of addressing their specific nature makes necessary the development of more solid, methodologically sophisticated approaches that respond to some of the theoretical and methodological weaknesses of this methodology. In this regard, this article advances in the definition of improvements and methodological innovations that attempt to address, among other issues, the complexity of these landscapes in terms of their establishment in the territory, the diversity of spatial and temporal scales in which they participate, their dynamic, highly anthropised character, and their uniqueness as landscapes that have been radically transformed by past industrial activity and which possess enormous cultural and heritage value.

Keywords Industrial landscape, Industrial heritage, Landscape character, Historic Landscape Characterisation, Methodological innovation

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Introduction

In recent decades, industrial heritage has become increasingly important as a cultural asset. The legacy left by human's production and extraction activities during the industrial revolution, not only on the territory, but also on society and culture, constitutes an emergent heritage that to date has not been sufficiently assessed and studied (Álvarez 2008; Benito et al. 2016; Läuferts and Mavunganidze 2009; Lopez and Bergomi 2022; Sobrino and Sanz 2019; Van der Merwe and Rogerson 2013; Merwe and Rogerson 2018; Van der Merwe and Timothy 2023).

Factories, mines, infrastructures, housing, installations, machinery, etc., constructed and shaped over the course of our industrial past and established in a given territory, define a heritage the study of and intervention in which cannot be carried out in isolation, but rather within its own territorial, historical, social, cultural and perceptive context. This refers to a landscape dimension of industrial activity. The concept of industrial landscape is, according to this logic, used to refer, in an overall, holistic sense, to those landscapes that are the result of an industrial culture. It contemplates the legacy that industrial activity and its related processes have left on the territory, on industrial buildings and constructions, but also on society and culture, playing an important role in the formation of their identity traits.

These landscapes currently constitute a phenomenon of extraordinary complexity and diversity, the study of which has been addressed belatedly by the scientific community in general. As a result, many of the landscapes generated during the industrial revolution, once they cease to function in the manner for which they were created, become subject to severe processes of deterioration and degradation (Alba 2016; Trachana 2011), despite their high cultural and heritage value as testimonies to the culture of a people and repositories of collective memory.

The fragility and vulnerability of these landscapes, often misunderstood and with very little presence in terms of current landscape assessment, makes necessary the development of a new approach to these landscapes that contemplates their study and intervention by means of a contemporary, scientific reading that integrates the numerous factors that affect them, i.e. territorial, heritage, cultural, environmental, economic, productive, social, etc. The manner in which to approach these actions and what frameworks or methodologies should be used, however, is still unclear (Loures 2008), and research that addresses their study in depth or interventions that have tried to recover these landscapes are scarce, to say the least. In this regard, more and more researchers and professionals in the field of heritage and landscape are recognising the need to study, enhance, protect and plan a future for these landscapes (Alba 2011; Álvarez 2008; Loures and Panagopoulos 2007; Loures et al. 2011; Sobrino and Sanz 2019). The implementation of these actions, however, requires the definition of regulatory, legal and planning frameworks as well as theoretical and methodological approaches that take into account the specific nature of these landscapes and tackle the numerous challenges that these landscapes, unlike others, present in terms of their study, analysis and management.

With regard to theoretical and methodological aspects, these would appear to be lacking in development in terms of being able to address in depth the study and intervention of these landscapes (Alba and Romero 2022). On analysis of the set of trends and methodological approaches to landscape studies that emerged on an international level from the second half of the 20th century to the present day, we can observe the existence of a wide diversity of models that are not always fully coherent (Mata 2008), and among which predominate those that approach landscape from a very partial standpoint that is only valid for predominantly natural or rural landscapes (Alba 2019; Peries et al. 2021). For this reason, in the absence of any methodological trend that prioritises the industrial landscape, the majority of these methodologies refer to spaces that have scarcely been transformed by human action.

More recent methodological approaches, however, such as the British methodologies Landscape Character Assessment and Historic Landscape Characterisation, known by the acronyms LCA and HLC, respectively, represent theoretical, conceptual and methodological advances in the study of landscape. Unlike other scientific methodologies that focus almost exclusively on natural or rural landscapes, these have, in recent years, been tackling the problems and opportunities presented by a great diversity of landscapes (Zoido 2010) in an effort to improve on previous exceptionalist, restricted approaches to landscape study.

This article focuses on the study of these methodologies, with special emphasis on the HLC methodological approach, which was designed to complement the LCA methodology in the study and management of those aspects of landscape character that are the result of past cultural processes. It is currently one of the most important methodologies in terms of understanding and managing historic landscape in the UK.

Objectives

The main aim of this research is to critically evaluate the validity and adequacy of the HLC methodology to the needs that the industrial landscape presents in its study, enhancement and intervention from a heritage and

cultural perspective. To achieve this objective, the following partial objectives are proposed:

- Study the HLC methodology in order to gain in-depth knowledge of its methodological approaches, principles and application to the analysis and interpretation of the landscape historic character in a holistic and comprehensive manner.
- Analyze the results of the application of the HLC methodology to the study and management of the industrial landscape of Blaenavon, in south eastern Wales, with the aim of reflecting on the implementation of this methodology for the characterization and management of the industrial landscape, focusing on its potential, but also on its weaknesses.
- Advance in the design of a series of guidelines, improvements and methodological innovations in the application of the HLC methodology that takes into account the specificity nature and unique identity of the industrial landscape with respect to other typologies of cultural landscapes and respond to the needs that these landscapes present in terms of their study, enhancement and management.

The final objective of this research is that its findings be used to address the challenges facing the study and assessment of and intervention in these industrial heritage landscapes in terms of their consideration as a resource, a historical-cultural testimony and an environmental factor of growing importance in terms of the quality of life of citizens. By doing this, the aim is to contribute to the resolution of the problems of both the scarcity and/or embryonic state of research into industrial heritage as a cultural landscape, and the obsolescence of many of the instruments and methodologies that are currently applied in the study and management of the same, which are limited to traditional parameters.

Methodology

As a working methodology, it is proposed in a first phase to address the study some key questions about landscape study and the European approach to this, which focuses on the landscape character developed by the European Landscape Convention (hereinafter ELC). To this end, we will proceed to analyze the concept of landscape promoted by the ELC, focusing on the broader and more integrative conceptualization that it contemplates and that refers to the importance of the character of the landscape.

In a second phase, the study of LCA and HLC methods based on landscape character will be delved into, the latter in more detail, examining their origins, principles and development in both theoretical and practical terms.

In a third phase, it is proposed to analyze the application of the HLC methodological approach to the Blaenavon industrial landscape, which constitutes one of the most significant examples of the application of the HLC methodology in a landscape generated by industrial decay. This study will be developed trying to investigate how this methodology has been applied to this specific case, reflecting on a series of relevant issues relating to the implementation of this methodology as part of the practice of characterization and management of an industrial heritage landscape and identify both its achievements and as well as some of its shortcomings. To address this study, we will first analyze the industrial landscape of Blaenavon in order to learn more about its configuration as a landscape of great heritage and cultural value. Below we propose to analyze the application of the HLC methodology to this industrial landscape based on the consultation of a series of reports prepared in the period 2004–2005 in connection with the development of a landscape characterisation programme funded by Cadw, as well as other studies similar previous landscape characterization projects that provided a rich and valuable source of information from different perspectives for the development of the Blaenavon Historic Landscape Characterization project. Based on these studies, the results of the identification and characterization of the different landscape units and the recommendations for their conservation and management will be analyzed.

In a fourth phase, based on the results of the above analysis, the proposal will offer a critical assessment of the validity of HLC in terms of addressing the complexity of industrial landscape in depth and offer a response to the specific needs relating to its study and management.

In a final phase, the proposal will offer, based on those theoretical and methodological weaknesses previously identified, a series of improvements and methodological innovations that advance in the design of guidelines that lead to an improvement in the HLC methodology in terms of its application to the study, enhancement and intervention in those industrial heritage landscapes in a manner that takes into account their specificity nature and unique identity.

Approaches

European Landscape Convention

In 2004, an international treaty enacted four years earlier by the Council of Europe and known as the European Landscape Convention, came into force (Council of Europe 2000). This convention attempted to renew the concept of landscape by promoting a conceptualisation that was both original and innovative in terms of consideration and intent. Article 1 defines landscape as: “an area, as perceived by people, whose character is

the result of the action and interaction of natural and/or human factors" (Council of Europe 2000: 2). The ELC neither distinguishes between landscapes nor classifies them, but rather attempts to develop a broader, more inclusive conceptualisation (Mata 2004; Zoido 2000, 2012) that not only applies to more outstanding or exceptional landscapes, but also to everyday, ordinary landscapes (Dewarrat et al. 2003), including those generated by industrial decay.

The ELC itself has supported the rapid dissemination of methodologies based on landscape character (Fairclough and Herring 2016). Although the ELC was published in 2000, its origins date back to the 1990s, at the same time as the LCA and HLC methodologies were beginning to take hold in the UK. The ELC was one of the first documents outside the UK to highlight the concept of landscape character, and did so both in its formal definition of landscape and in the action it requires of its signatories, this being "to analyse their characteristics and the forces and pressures transforming them" (Council of Europe 2000: 4). This is one of the most influential factors in landscape characterisation in Europe.

Landscape character

Over the last three decades the concept of "landscape character" has become an approach on which a number of methods for the study, assessment and management of landscape have been defined, and not only in Europe, but also in other parts of the world. Landscape character refers to that which characterises a landscape in terms of that which constitutes it, makes it unmistakable, or different from others, and not necessarily more valuable than the rest (Mata 2014; Swanwick 2002a, 2004; Tudor 2014). The ELC indicates that the character "is the result of the action and interaction of natural and/or human factors" (Council of Europe 2000: 2). According to Swanwick (2002b: 9): "Landscape character is defined as a distinct and recognisable pattern of elements that occur consistently in particular type of landscape. Particular combinations of geology, landform, soils, vegetation, land use, field patterns and human settlement create character. Character makes each part of the landscape distinct, and gives each its particular sense of place. Whether we value certain landscapes for their distinctiveness, or for other reasons, is a separate question".

While landscape-based approaches began to gain some traction in the 1980s (Countryside Commission 1987, 1993), becoming almost fully established by the turn of the century (Swanwick and Land Use Consultants, 2002), with the ELC, as mentioned above, as the driving force behind them, the origins of these date back to the 19th and 20th centuries, when they emerged as a consequence of the concern at the time for the protection and preservation of particularly threatened landscapes (Fairclough et al. 2018).

Landscape Character Assessment

The LCA methodology has its origins in landscape experiences that were oriented towards territorial management, planning and development carried out by public agencies in different countries and regions such as the United Kingdom, France, Holland, Switzerland and Italy. The methodology's approach emerged in the 1990s, and was centred on the notion of landscape character as a central concept with regard to both the study and assessment of landscape and intervention in the same.

This methodology, which is geared towards determining the character of the landscape, is also concerned with understanding its dynamics and forecasting its possible evolution. It is applied at different territorial scales, ranging from national to local (Riesco et al. 2008; Wascher 2005), and constitutes an iterative and highly flexible method that can be adapted to the particular conditions of each landscape. LCA is not a closed, delimited procedure, but rather one that is subject to on-going development in an effort to improve its methodology by means of new initiatives relating to both characterisation and the implementation of its results in different planning and management instruments.

Since its creation, this methodological procedure has gone on to achieve widespread acceptance in the international context. Its use has spread to different parts of the world and it is currently the most extensively applied methodology in Europe (Zoido 2010). It has been put into practice in numerous studies or initiatives in different countries, including the Countryside Character Initiative of England (Swanwick 2002b), World Map of Present-Day Landscape (Milanova et al. 1993), Austrian Cultural Landscape Mapping (Fink et al. 1989), Traditional Landscapes of Flanders (Antrop 1997), Inventaire régional des paysages de Basse-Normandie (Brunet and Girarden, 2001), Landscape Characterisation in Portugal (Pinto-Correia et al. 2003) or the Atlas de los Paisajes de España (Mata and Sanz 2003), among others. The adaptation of these initiatives to the postulates of the ELC methodology goes a long way towards explaining its remarkable success.

Historic Landscape Characterisation

Pre-existing methodological approaches and the origins of HLC

The HLC methodology originated in England during the 1990s, and while it was employed as a means of characterising and managing landscapes through a more holistic understanding of their historic character, it both originated and diverged from the lengthy tradition of British archaeology and landscape history. Pre-existing

methodological approaches developed during the 19th and greater part of the 20th century were often limited to protecting and preserving especially endangered landscapes (Fairclough et al. 2018), and were based on historical and archaeological landscape interpretations that were only available for very limited areas possessing historical or archaeological significance, more conventional approaches being, in the main, limited to small-scale operations. Thus, while at the time both landscape archaeology and landscape history research had already existed for several decades (Bowden and McOmish 2011), their approaches to heritage recording and preservation were rather conventional and soon revealed a number of shortcomings linked to the study and management of landscape and heritage. These focussed primarily on specific monuments and/or sites that were, for the most part, treated in isolation and out of context. As such, these methodologies fell short of a broader view of heritage that would include the concept of landscape and offer an effective means of visualising "historic character" in a way that would allow its historic features to be satisfactorily studied and/or managed.

This problem was clearly evidenced in Britain during the post-war period from 1945 to 1970, when the need to study the growing archaeological evidence uncovered during reconstruction meant that archaeologists and academics were overwhelmed by the volume and complexity of work facing them. The clearing of large areas of ruined buildings revealed the existence of stratified layers that had accumulated over almost 2000 years. Limited resources, however, meant that many of the decisions taken ended up either destroying or ignoring medieval and post-medieval remains. In addition, from the late 1960s onwards, the boom in motorway construction highlighted shortcomings in archaeological operations, in this case relating to rural landscapes (Turner 2018).

During the 1950 and 1960 s, social pressure to reclaim the material remains of the past led to developments within the archaeological profession. The growth in fieldwork during this period increased not only the amount of available archaeological data but also the number of finds, the management of which often implied some element of intellectual, social or economic conflict (Turner 2018). From the 1970s onwards the demand for a new holistic approach to the landscape increased. Thus, archaeological work that throughout the 19th century was dominated by the basic principles of geological stratigraphy, since the 1970s had its own science of stratigraphy. The methodological contributions that were developed in Britain in the 1960 and 1970 s in the field of stratigraphic excavation, summarized and disseminated by Barker (1977) and, especially by Harris (1975, 1979), allowed the development the first systematic programs related to archaeological practice in urban contexts. The invention and development by Harris (1979) of the matrix or stratigraphic diagram was a decisive methodological advance and one of the most relevant in contemporary stratigraphic archaeology (Carandini 1991) by offering the possibility of representing the relationships of the stratigraphic units. over time, locating the surfaces and deposits of physical remains of the past into a sequence in relative time. These stratigraphic advances soon spread throughout the European continent thanks to the development of joint work with countries such as Italy. Likewise, the application of Harris' stratigraphic sequences to the field of architecture, suggested by him, although not developed, applied to the analysis of historical buildings and monuments facilitated the understanding of the diachronic evolution of these buildings and their historical changes.

However, in the late 1980s and early 1990s the realisation by archaeologists of, on the one hand, the possibility of protecting individual monuments from being tampered with, though not so the historic landscape, which was not only poorly understood but also susceptible to destruction through both partial and large-scale changes, and, on the other hand, the significant role that historical processes play in the definition of the actual character of the landscape, raised the need for addressing the improvement and/or development of new tools for the study, protection and management of all historic landscapes, rather than just those of greater value. In this sense, the application of stratigraphic archaeology was more recently extended to complex large-scale contexts such as the study of the historical landscape, facilitating its holistic understanding.

As well, from the late 1980s on, English Heritage, now called Historic England, as the entity charged with advising on the care of UK heritage, sought practical ways of extending its influence beyond monuments, buildings and heritage sites, its objective being to examine historic landscapes that had often been overlooked in the UK's development and planning processes (Herring 1998).

In the early 1990s, English Heritage coordinated a series of experimental research projects in various parts of the country in an effort to test a number of emerging methodologies that would not only address this issue (Fairclough et al. 1999), but also respond to both the country's need for landscape characterisation that bears in mind the historical and cultural aspects of its landscapes and to the lack of a landscape dimension in the management of its archaeological and heritage resources (Fairclough and Rippon 2002; Rippon 2004).

Initially, after considering various solutions to this problem, it was felt that the LCA methodology offered the best way forward (Fairclough et al. 1999). In the end it was archaeologists, however, who were instrumental in the development of HLC, and who realised that the

historical dimension of the landscape had been underestimated in previous applications of LCA methodology (Countryside Commission 1996).

In an attempt to find ways of applying the LCA methodology with appropriate historical depth, a first pilot study was carried out in 1993 on Bodmin Moor, in southwest England (Cornwall County Council 1996; Fairclough and Herring 2016; Herring 1998, 2013), as part of a broader LCA project co-ordinated by the English Heritage and the Countryside Commission (Cobhams et al., 1993; Land Use Consultants 1994). This pilot study showed both the potential and the difficulty of this combined approach, as it required landscape characterisation based on specialist knowledge at a scale that reflected the cultural and historical aspects of the landscape with an appropriate level of detail, and which differed significantly from the scales adopted by LCA.

The various projects sponsored by English Heritage led to the development of the HLC methodological approach that differed from LCA as a way of presenting, analysing and interpreting the historic character of the landscape in a more holistic, comprehensive manner (Aldred and Fairclough 2003; Clark et al. 2004; Fairclough 2002; Fairclough et al. 1999; Herring 2013). Thus, the HLC methodological approach arose. This was designed to complement the LCA methodology in aspects pertaining to the analysis and management of those historical elements that define the character of a landscape. This methodology allows landscape to be interpreted in the current context from a historical perspective, via the changes that have occurred to it over time or during certain periods (Turner 2006a), providing analysis and management of the same in an effort to safeguard its future (Fairclough and Herring 2016; Herring 2009).

HLC development and principles

Development of the HLC methodology took place quite rapidly in the early 1990s due to the requirement proposed by English Heritage for an approach to landscape characterisation from a historical perspective (Aldred and Fairclough 2003; Clark et al. 2004; Fairclough 1999; Fairclough and Macinnes 2003; Fairclough et al. 1999; Herring 1998, 2009; Rippon 2012; Rippon and Turner 1993; Swanwick 2002a).

This methodology - the definition of which was influenced by the initial development of LCA - while it had different origins and objectives, also shared with LCA some methodological aspects and some of the principles of traditional approaches to archaeology and landscape history developed in the 1980 and 1990 s, and subscribed to the key principles of ELC, while following a different path (Fairclough and Herring 2016; Fairclough and Macinnes, 2003). The most significant difference lies in how the character of a landscape is identified and mapped. This differs not only in the fact that all identified areas have a historic character of one type or another that HLC defines on the basis of a specific and limited number of categories (Herring 1998; Turner 2018), while LCA allows each area to be defined on the basis of a combination of characteristics that makes it unique, but also in the size of the identified landscape areas. In LCA, these tend to be large in size, as they often relate to topography and land cover, while in HLC they tend to be quite small and decidedly local in character. Also, while LCA tends to focus on the study of the contemporary landscape, HLC's priority is to present an interpretation of historical processes of landscape change, whether older or more recent. A final difference is that HLC does not normally develop a landscape assessment, but rather a characterisation. That is to say, it does not provide a value judgement on the different landscape areas identified and characterised.

This methodology is quite flexible, and allows characterisations to be tailored to each landscape in an effort to respond to different contexts and to include a variety of different perspectives. So, while initially focused predominantly on rural landscapes (Fairclough and Wigley 2006; Fairclough et al. 2002), the methodology was soon extended to other urban and metropolitan contexts (Dobson 2012; Quigley 2010; Quigley and Shaw 2010; Thomas 2006). It can also be applied to landscapes that show long-term stability (Turner 2007), such as those of ancient origin, as well as those of more recent creation (Dingwall and Gaffney 2007).

Initially based on the creation of databases maintained by local authority archaeologists, this methodology has continued to develop, without undergoing major changes in its underlying principles or ambitions, significant improvements that include new approaches and techniques relating to the increased use of Geographic Information Systems (GIS), the use of more advanced interpretative approaches and more complex classifications.

The success in recent years of this pioneering methodology in British landscape studies has been remarkable, and its application by archaeologists and historians has been carried out in order to offer information on landscape management, planning and research throughout the UK (Clark et al. 2004; Fairclough et al. 2002; Highways Agency 2006; Finch 2007; Turner 2006b, 2007; Swanwick and Fairclough 2018) as well as in other countries in Europe (Bolòs 2010; Bolòs et al. 2016; Crow and Turner 2009; Crow et al. 2011; Lambrick et al. 2013; Nogué and Sala 2018; RCE 2017; Sarlöv et al., 2018; Turner and Crow 2010; Turner and Fairclough 2007; Turner et al. 2018), in Turkey (Atik and Karadeniz, 2018; Crow and Turner 2009; Demir 2016; Erdoğan et al. 2020; Sengur and Nurlu 2021), and even as far countries as

Tanzania (Käyhkö et al. 2018), South Africa (Escott and Kiepiel 2010; Quayle et al. 2011), South Korea (Kim and Pauleit 2007), México (Rojas et al. 2012), the United States (Dingwall and Gaffney 2007), Canada (Prosper 2018) or New Zealand (Brabyn 2009; Brown and Brabyn 2012; Stephenson 2010; Swaffield et al. 2018), Australia (Lennon 2018), among others.

Case study: Blaenavon industrial landscape

The industrial landscape of Blaenavon is one of the most significant examples of the application of the HLC methodology in a landscape generated by industrial decay. Its study will allow us to reflect on a series of relevant issues relating to the implementation of this methodology as part of the practice of characterisation and management of an industrial heritage landscape.

Blaenavon industrial landscape

Located at the eastern end of the South Wales Coalfield, some forty kilometres north-west of Cardiff, this landscape takes its name from the town of Blaenavon, the principal settlement in this heritage setting. It features a number of significant individual monuments of special architectural, historic and heritage interest in a rich landscape that evokes an industrial past linked to iron and coal production.

While industrial activity in the area can be traced back to around 1675 and included small-scale mining, it was not until 1789 that the blast furnace complex, Blaenavon Ironworks (Fig. 1), was built, at the time the second largest smelter in Wales and one of the most important in the world. In 1812 a new forge was built to the north of Blaenavon and iron ore and coal mining was taken to a larger scale, replacing surface mining with deep shaft mining.

This activity included the construction of workers' housing, coal mines, limestone quarries, ironworks, brickworks, waterways and new railway connections that replaced primitive paths, giving rise to a dense network of railways for the supply of raw materials and the transport of products to the coast, and which featured the most advanced technology of the time. This meant that in a short space of time the landscape was rapidly transformed into a characteristically industrial landscape.

In 1860 the company founded a new steelworks, but the subsequent invention, in 1878, of a bulk steelmaking process caused the scale of production to expand, and the town of Blaenavon grew as industrial activity developed. Its buildings reflect the distinctive, thriving culture that had developed in the iron and coal mining areas of the South Wales valleys with educational facilities, social facilities, chapels, pubs, shops, etc.

The decline in steel production at the turn of the century allowed for the growth of coal production for export, which reached its peak in 1913. This decline in production activity, however, resulted in the cessation of steel production in 1938 and the closure of the last coal mine, Big Pit (Fig. 2), which was in operation until 1980.

The result of this industrial past is the configuration of a landscape of great heritage and cultural value, and it remains one of the world's best surviving examples for the study and understanding of the social, economic and technological process of industrialisation through iron and coal production in the late 18th and 19th centuries (Knight 2016).

For the most part, this landscape is now protected by legal measures and is actively conserved and interpreted. The archaeological heritage of Blaenavon has received several international awards throughout history and, in

Fig. 1 Ironworks, Blaenavon, Wales (United Kingdom)
Source: Own elaboration

Fig. 2 Big Pit, Blaenavon, Wales (United Kingdom)
Source: Own elaboration

December, 2000, was listed by UNESCO (United Nations Educational, Scientific and Cultural Organization) as a World Heritage Site under the designation "Blaenavon Industrial Landscape".

Blaenavon Historic Landscape Characterisation

Below is an analysis of the methodology and results of the application of HLC to the industrial landscape of Blaenavon taken in abridged form from the report entitled Historic Landscape Characterisation: Blaenafon / Blaenafon. Part 1 and 2: landscape characterisation and management (Roberts and Jones 2005) undertaken by Glamorgan-Gwent Archaeological Trust (GGAT) in connection with the development of a landscape characterisation programme funded by Cadw, the historic environment service of the Welsh Government and part of the Tourism and Culture group. The aim of this programme was to define and map the different areas that constitute this landscape and that possess a consistent historic character that is useful for management purposes and compatible with the LANDMAP database. This study was carried out over the period 2004–2005 and allowed for the identification, description and characterisation of 21 Historic Landscape Character Areas (HLCAs) for which guidelines for their conservation and management were established (Figs. 3 and 4).

The development of this report within this landscape characterisation programme benefitted from the previous experience gained from the implementation of a similar study of the Cwm Clydach Historic landscape (Roberts 2004) and by several previous studies carried out jointly by Countryside Council for Wales and the local authorities in this area based on GIS / LANDMAP studies. These projects were carried out for Monmouthshire in 2000 and three years later for Torfaen and Blaenau Gwent (Roberts 2003). It also benefited from the two volumes of the non-statutory Register of Landscapes of Special Historic Interest in Wales published from 1998 to 2001 (Cadw et al. 1998, 2001).

These prior studies provided a rich and valuable source of information from different perspectives for the development of the Blaenavon Historic Landscape Characterisation project, and this, in turn, sought to enrich the traditional approach to landscape study by emphasising the depth of time and historical process, showing how the different landscape areas identified reflect distinct patterns and rates of change depending on their particular history.

A preliminary phase of research work involved consulting the Sites and Monuments Record and searching for relevant reports and other secondary sources in Cadw's Listings and Scheduled Ancient Monuments in Wales, the National Monuments Record of The Royal Commission on the Ancient and Historical Monuments of Wales and the Central Registry for Aerial Photography in Wales. Cartographic information was also obtained from the Gwent Record Office, the National Monuments Record, The Royal Commission on the Ancient and Historical Monuments of Wales and the National Library.

With the information obtained, a preliminary sketch of the HLCAs identified was made at a scale of 1:25,000 and 1:50,000. The traces of industrial activity in this

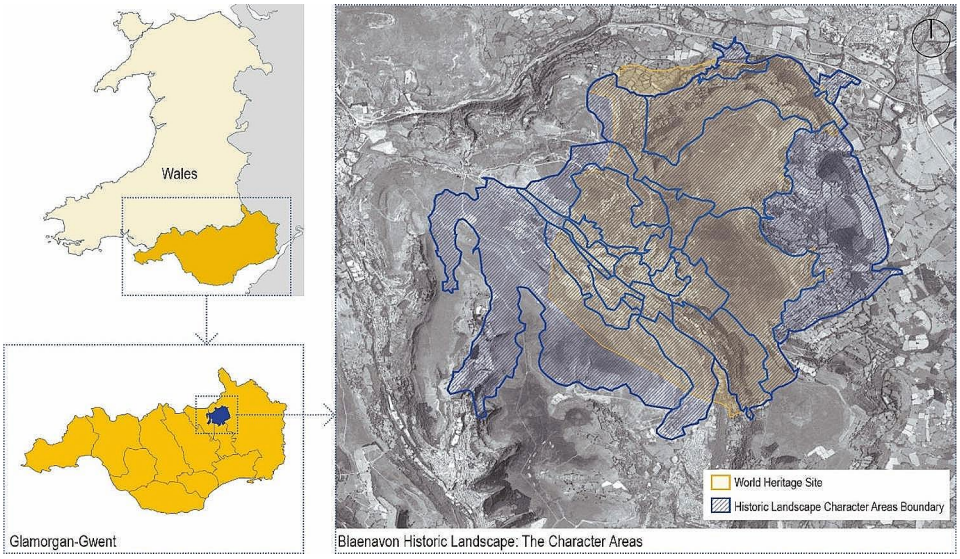

Fig. 3 Blaenavon historic landscape: The character areas
Source: Own elaboration

landscape, defined by the limits of the different areas of exploitation, mineral processing and other settlements, as well as transport lines (rail, tram and road), among others, were taken into account. This information was then transferred digitally using the GIS-based MapInfo tool. Registration tables were created with the main sites and monuments identified and the digitisation of the different HLCAs initially identified was carried out as accurately as possible. Finally, a process of revision of the identification and characterisation of these areas was carried out using information obtained from fieldwork, aerial photographs and other sources such as suggestions provided by members of the Blaenavon Industrial Landscape Historic Environment Working Group, and the various digital maps and record tables were updated with this revised information.

As a result of this work, 21 HLCAs were identified, of which four were related to urban industrial areas, two were areas linked to industrial transport, two referred to industrial iron processing areas and at least five areas were identified as relating to extractive activities. For each of these areas, a written record containing their principal characteristics was produced and complemented by a photographic catalogue. All this information was used to prepare the final report, which also included a series of recommendations for the conservation and proactive, long-term management of each of the areas identified and characterised.

Results and discussion

The study of the HLC methodology applied to the specific case of Blaenavon has demonstrated that it is a valuable methodology for the identification, characterisation and management of industrial heritage landscape. It provides a broad perspective that transcends the consideration of an isolated 'archaeological site' as well as an initial basic understanding of its historical character and a landscape approach that is necessary if we are to understand how these landscapes were created in the past and how their future can be managed.

However, the specific nature and identity of these landscapes with respect to other typologies of cultural landscape means that this methodology should be adapted to their specific needs and address in greater depth, by means of more theoretically solid and methodologically sophisticated approaches, the nuances that characterise these landscapes in relation to their establishment in the territory, their development and transformation over time, their uniqueness as landscapes highly transformed by past industrial activity, their consideration as landscapes of great cultural and heritage value and repositories of collective memory, as well as the risks and threats they currently face.

Along these lines, the proposal is for a number of improvements and methodological innovations regarding the application of the HLC methodology to the industrial heritage landscape, the following aspects being suggested for review:

Landscape characterization

On examination of HLC databases it is possible to observe that these tend to represent a seemingly simple, uncontested historical interpretation of Blaenavon's industrial landscape that fails to reflect its subtleties and complexities. While this methodology aims to map and describe the diversity of this landscape by identifying

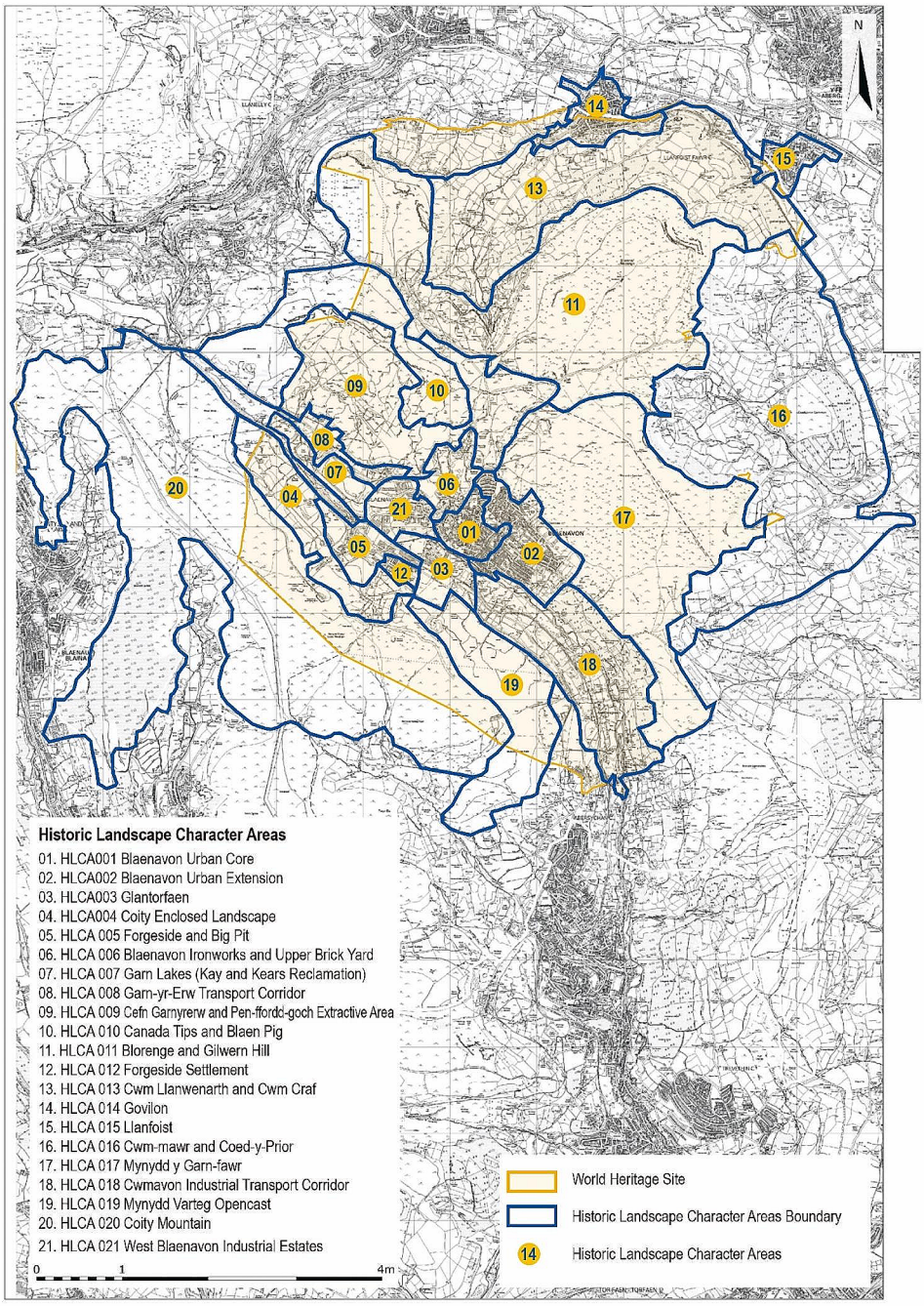

Fig. 4 Blaenavon historic landscape: The character areas
Source: Own elaboration

areas the character of which has been shaped by similar and recognisable historical processes (Turner 2018), including a variety of historical characteristics, the landscape models used are only capable of handling a relatively limited number of character types at any one time. So, while all HLC projects can identify a variable number of areas, these can only be associated with an established, limited number of character types. This gives rise to a series of problems relating to the study of the industrial heritage landscape, among them that which relates to those areas that include features belonging to different time periods that lend definition to their character. For these areas it remains unclear which type of character should be mapped, and it is common to assign a single predominant character which only allows for minor variations to be absorbed.

This limitation results in a loss of information that simplifies the complexity of this landscape and makes it

difficult to both research past trajectories in depth and manage and plan for potential future trajectories.

A possible solution to this simplification of the complex patterns that characterise industrial landscape could be to make a series of adjustments that would allow this methodology to be formalised in a more rigorous fashion and to aggregate different types of characters to the same area (Lambrick et al. 2013; Nurdam et al. 2020; Watson and Dixon 2018). Likewise, a further option would be the use of GIS databases supported by descriptive and interpretative text, thereby allowing a range of attributes to be recorded with the aim of linking different types of character to each area. This would allow a relatively detailed picture of the historic character of these landscapes to be constructed and their heritage dimension to be contextualised and would offer support for decision-making relating to the management and planning of the same.

Interdisciplinarity

Topics such as "landscape" or "heritage", possibly due to their nature of being open to a variety of interpretations, require interdisciplinary action, which implies the interrelation of two or more discrete approaches, as interdisciplinarity is an intangible element that resides both between and across disciplines.

On analysis of the information obtained from the characterisation of each of the HLCAs in the Blaenavon industrial landscape, we can see that it is limited to a historical perception that does not go beyond the expert knowledge possessed by the writer of the report, ignoring other knowledge such as that originating from other disciplines, oral histories, old photographs or other sources. This makes it difficult to combine or complement the characterisation with other approaches. The complexity of industrial heritage landscape makes it imperative that its study address, in a global and integrated manner, a multiplicity of dimensions (territorial, environmental, historical, social, cultural, economic, productive, perceptive, etc.).

In this sense, it would be advisable to review the HLC methodology with the aim of incorporating other agents into its development, for example, specialists from other disciplines (urban planners, geographers, architects, sociologists, ecologists, artists, etc.), former workers, residents, visitors, local scholars or other people interested in the study of these landscapes. With regard to interdisciplinarity, the truth is that the levels of interdisciplinary collaboration and interaction incorporated into HLC are negligible, as this has long been restricted to one discipline alone, but also because of the difficulty of working in a team comprising a multiplicity of disciplines. In this regard, lack of experience, the existence of overly inward-looking disciplinary and methodological traditions, or corporate interests defended by the respective professional associations have all played their role in making interdisciplinary dialogue problematic.

However, there are now concrete cases in which application of this methodology has favoured the meeting and exchange of ideas between different disciplines and made it possible for different disciplinary points of view to converge in a more fruitful conversation (Fairclough et al. 2018). It would therefore be interesting to explore this avenue of research with the aim of including these advances in the study and management of industrial landscape.

Digital tools

The rapid development of digital technologies in recent decades has accelerated the evolution of HLC methodology and is even encouraging the development of new approaches that will transform the application and use of the same. However, there are a number of issues relating to how HLC uses this technology that need to be examined, among them the need to improve how landscape features are recorded without resulting in over-simplification of complex patterns.

On analysis of the use of digital tools such as LANDMAP or GIS in the case of Blaenavon, it is possible to observe that these tended to reduce the complexity of this landscape to two dimensions, concealing many of the subtleties of its character that refer to data of a more qualitative nature and to more subjective or experiential aspects (Austin 2007; Williamson 2007). An improvement of this methodology in this sense should contemplate a revision of its design in order to include all those aspects that define the character of a landscape without negating those of a historical nature and without falling into solipsistic, even narcissistic responses that would be even more reductionist (Harvey 2015). The fact is that the use of digital tools linked to landscape and heritage based on GIS should be carried out without simplifying the complexity of these landscapes.

The relevance of these tools lies precisely in how they facilitate the production of HLC datasets and the analysis, mapping, comparison and contrasting of various type of cartographic data, as well as in the role they play as vehicles that favour effective coordination between different disciplines and agents related to the study and integrated management of the landscape, including the citizens themselves. To this end, new tools originating from different landscape disciplines need to be incorporated into and/or adapted to the HLC methodology via these digital techniques in order that specialists from various disciplines may be brought together in a manner that fosters a holistic understanding of the landscape that transcends the vision of the individual map-maker (Dalglish and Leslie 2016). Furthermore, the involvement of residents, visitors and other stakeholders would

assist in the gathering of relevant information that would not only give rise to richer data sets (Primdahl and Kristensen 2016), but also help establish a dialogue between communities and local authorities in an effort to encourage debate and agreement on priorities relating to future landscape management and planning. In this sense, emerging digital techniques such as participatory GIS with mobile phones could provide intuitive and cost-effective ways to include contributions from a wide range of contributors (Fairclough et al. 2018), making the HLC methodology a more participatory, rather than solely expert-based, approach, which would make it a powerful tool for landscape study.

Spatial and temporal scale

On examination of the spatial scale used in the study of the industrial landscape of Blaenavon, it can be seen that a local scale (1:25,000–1:50,000) has been used, which ignores the diversity of spatial scales that this landscape offers, which include those of a more regional or sub-regional nature. It should not be forgotten that, while Blaenavon was the centre of iron and coal production in this region of South Wales, this activity was particularly intense in the nearby counties of Monmouthshire and Torfaen, so its development needs to be understood in a broader spatial context, at scales that allow this development to be studied over a wider area so that the landscape may be considered in relation to other nearby industrial locations with which it had ties.

The complexity of the spatial systems that define industrial landscapes makes it necessary to study these at different scales in an interrelated manner, from the most local scale to sub-regional or even regional scale (Stuart 2012). The HLC method is designed to approach the study of a landscape at a given scale and can therefore only use datasets that operate at that scale. Landscape and heritage management, however, operate simultaneously on many scales, and these are not always perfectly matched. In this sense, an improvement to this methodological approach should deepen the hierarchical systematisation of the analysis of these landscapes across their various scales, supporting the knowledge and management of these landscapes on the basis of their consideration as an on-going phenomenon.

With regard to the temporal scale, the application of the HLC methodology to the case of Blaenavon has tended towards a temporal simplification of this industrial landscape. Attributes have been assigned to particular surfaces based on time intervals that have been condensed into a single layer in which all periods are represented concurrently with the present moment, as if all the past resides in the present and the landscape is a seamless chronological whole. This has provided an initial basic understanding of the landscapes' history which can be considered as a starting point for their study, but which nevertheless needs to be developed in more detail in order to take into account the dynamic nature of these landscapes marked by rapidly changing technology and modifications in modes and systems of production in order to be fully understood and appreciated. Ignoring the historical and cultural dimension of the transformation of these landscapes may, in the end, constitute a risky approach from the point of view of management and/or conservation.

This raises the need for the definition of new tools and more sophisticated methods that are capable of characterising these landscapes in such a way that they take into account the convergence of periods of time, not necessarily finished or conclusive, that coexist in these landscapes, the coexistence of historical and contemporary dimensions, and that are based on the understanding of these landscapes as a dynamic reality that is in continuous and constant mutation.

Social participation

The highly anthropised nature of these industrial landscapes, their value as landscapes of the culture of work and their decisive contribution to defining the identity of generations of workers, the history of a people and the scientific and technological culture of a very recent period in the history of mankind, means that the incorporation of social agents into this methodology in its various phases would be advisable. HLC scarcely contemplates social participation in the process of studying and managing landscape, however, the truth being that, in its application to the case of Blaenavon, this factor has not been considered. In the evolution of this methodology up to the present day, several attempts have been made to broaden this social participation and engage a wider public in an effort to achieve one of the most elusive objectives set out in HLC, namely to involve stakeholders effectively in landscape and heritage planning and management (Moore et al. 2020; Turner et al. 2020). However, HLC in developing methods of social participation still lags far behind the development of other expert-driven aspects (Butler 2016).

While some examples exist of more elaborate attempts at public participation, they are not achieving their goal. In many cases the inclusion of social participation does little more than establish more transparent procedures in the designation of protected areas, or offer greater confidence in public consultation and/or decision-making processes, without amounting to fully democratic participation.

The reasons why HLC has not developed a more relevant participatory component are diverse. The fact that the landscape characterisation process is often carried out by experts in professional or academic environments

that facilitate completion of the task, and in shorter time frames, is an important factor. The key reason, however, is the difficulty of incorporating citizen participation processes at a scale beyond the local level, which is essential in terms of successful landscape characterisation. So while it is possible to engage people to speak out and defend "their landscapes" (their neighbourhood, their locality, etc.), when this needs to be carried out at a scale that encompasses an extensive territorial area, the task is more complex, in that it requires from society a more abstract assessment that may demand a particular set of expertise and may not always be related to imminent problems or threats that directly affect the interests of a local community (Swanwick and Fairclough 2018).

So, the limited degree of social participation to date remains a methodological and theoretical weakness of HLC that still needs to be addressed (Austin 2007; Fairclough et al. 2018; Williamson 2007) by bringing together specialists and non-specialists and by emphasising the social dimension of the landscape concept in a way that leads to the participatory democracy that ELC requires for the definition and implementation of landscape policies. A higher level of public participation of a broader nature involving a diversity of social actors, including local businesses, associations, action groups, institutions, etc., mediated rather than controlled by professional experts, can bring about a paradigm shift in the study and management of the industrial heritage landscape.

A possible solution, perhaps, would be to adopt participatory approaches that are already commonly used in geography, urban planning and environmental psychology. There also exist a number of small-scale, local cases that offer good indications of where the participatory process in the study and management of the industrial landscape should be heading. Such is the experience of the Landscape Observatory of Catalonia, which, in its work both as an advisory body to the Catalan administration and in raising landscape awareness in society in general, has developed participatory and interdisciplinary methods of generating knowledge (Nogué and Sala 2018). The observatory's efforts in the elaboration of the Landscape Catalogues of Catalonia constitute a pioneering, experimental process in social participation (Nogué et al. 2010). These catalogues commit to a participatory process in all phases of their preparation, from the identification and characterisation of the various landscape units to the definition and specification of the landscape quality objectives and intervention proposals, and seek to maximise representation through a combination of techniques that includes interviews, workshops, web surveys, information sessions, opinion studies, discussion groups, etc. (Nogué and Sala 2006).

Landscape management and planning

A re-examination of the application of the HLC methodology to the Blaenavon case shows that it does not impose quality judgements about the landscape, but rather merely identifies, describes and interprets its historic character, without assessing it. In other words, it does not study its value or identify its significance. This aspect differentiates it from LCA, which does assess landscape character. This is because the HLC methodological approach, as a rule, does not look specifically at the preservation of the landscape, but focuses on its character, on understanding how it came to be what it is, in order to determine how it can be improved in the future, which is why it does not rush to make value judgements.

However, in the specific case of Blaenavon, it does establish a series of priorities aimed not only at management of the site, but also at its preservation, and it does so without making a prior assessment. In this sense, given the degree of deterioration and obsolescence in which many of the landscapes generated by industrial decay are found, the inclusion of an assessment phase, in a similar way to that envisaged in the LCA, could be interesting, as the historical and cultural values of many of these industrial landscapes are still not fully recognised in many regions and this is an essential issue in terms of their correct management, planning, legal protection, conservation and restoration.

So while HLC methodology offers valuable interpretations of historical processes and their consequences for landscape character, it provides limited information that is of use in planning processes. As such, there exists a need to develop more robust approaches and practical tools that inform, support and encourage better landscape management and planning, and while the development of these tasks must be based on historical characterisation of these landscapes, it is the prior identification of their cultural and historical values that will promote their incorporation into future scenarios for the purposes of planning and management (Dobson and Selman 2012). Likewise, given the speed at which these industrial heritage landscapes are transformed once the main function for which they were created has ceased, thereby establishing a process of deterioration and obsolescence that advances at a significant rate in a short space of time, an assessment of these landscapes that contemplates the identification of their weaknesses, risks, strengths and opportunities as well as an understanding of possible future scenarios of change will facilitate the management and planning of these landscapes by advocating positive change that takes into account their historic character and heritage aspects.

All information gathered from landscape characterisation, assessment and evaluation has the potential to assist landscape planners in developing holistic, informative

approaches to managing the transformation of these landscapes in an effort to promote the incorporation of their cultural and historic values into future scenarios (Ridding et al. 2020). It can offer information relating to the potential of these landscapes, warn of the risks of disruption to their beneficial or emblematic character and reveal the opportunities that these present if the character in question is reinforced as part of the development of a proposal, etc., thereby offering an effective platform for assessing desirable and undesirable scenarios of landscape transformation as well as the consequences of each resulting scenario in terms of the planning process. This information is therefore a valuable addition to the set of tools and data available to planners in terms of assessing options for the future of these industrial heritage landscapes. It can also alert both builders and developers to the likelihood of heritage constraints or specific requirements to be taken into consideration before a final decision is made.

Enrichment of this information could be achieved both through interdisciplinary collaboration that draws on data from different fields of knowledge and by promoting public participation in the planning process by offering contrasting views from a variety of interest groups. This would not only support more sensitive, context-specific planning and management strategies, but also encourage better-informed public participation in the landscape and heritage planning and management process, in line with the objectives of the ELC.

Conclusions

Industrial heritage landscape today is currently a phenomenon of extraordinary complexity and diversity, the study of which has been addressed belatedly by the scientific community in general. The various approaches that have been taken to the study of these landscapes from the perspective of different disciplines have barely managed to address their complexity and/or lack sufficient theoretical and methodological development. In fact, no methodological trend currently exists that focuses primarily on the identification, characterisation, evaluation and intervention of these landscapes (Alba and Romero 2022; Juaristi 2007). However, it is possible to identify methodological approaches that have represented a theoretical, conceptual and methodological advance in the study of landscape, and which in recent years have addressed the problems and opportunities presented by a great diversity of landscapes, including those generated by industrial decay. This is the case of the HLC methodology, the application of which to the specific case of the industrial landscape of Blaenavon has been analysed in this article.

The study of this landscape has shown HLC to be a valuable methodology for the characterisation and management of these landscapes and its development as an innovative tool continues. However, detailed analysis has led to the realisation that, while it provides an initial basic understanding of the historic character of these landscapes, and constitutes a starting point for further study, the importance of considering the specificity of an industrial heritage landscape requires not only efforts to ensure that the advances made in the design of this methodology are maintained, but also that the methodology itself can be adapted to new ideas and new requirements. In its application to these landscapes, then, it would be necessary to develop more solid, methodologically sophisticated approaches that respond to some of the theoretical and methodological weaknesses that have been identified in this article, and which relate, among other issues, to the need to address certain aspects related to their specific nature and identity in terms of the complexity of their establishment in the territory, the diversity of spatial and temporal scales in which they participate, their dynamic and highly anthropised character and their singularity as landscapes highly transformed by industrial activity in the past and possessing great cultural and heritage value.

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Availability of data and materials
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Declarations

Competing interests
The authors declare that they have no competing interests.

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