

MAP ANALYSIS OF CULTURAL HERITAGE VALUES IN DESIGNED LANDSCAPES: A CASE STUDY ON ČERVENÝ HRÁDEK, CZECH REPUBLIC

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Abstract

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A repository of cultural history, a landscape documents past civilizations and can be viewed as a specific type of heritage. UNESCO distinguishes three types of cultural landscape, of which a clearly defined landscape designed and created by man is the most easily identifiable. Such a landscape embraces gardens and parklands constructed for aesthetic reasons with monumental buildings and ensembles. Old maps, aerial photographs, and GIS technology enabled us to study historic land cover and to trace its changes up to the present. Designed landscapes are highly valuable, and their identification and protection is an important aspect of cultural monument protection. Detailed archival research and knowledge of historical development form the basis of the analyses. Historical cultural artifacts, designed landscape composition, and dendrological history were defined using ArcGIS software. We present a case study on Červený Hrádek, which is located near the towns of Jirkov and Chomutov and adjacent to lignite mines in the Most basin. This location represents a high risk of endangerment to valuable cultural history. Therefore, the identification of Červený Hrádek's significant historical artifacts and their careful management are highly recommended.

Keywords: cultural heritage, landscape park, heritage protection, management, old maps, identification of valuable historic artifacts, Červený Hrádek near Jirkov

INTRODUCTION

A landscape-based approach for the European continent presents landscapes as a possible new paradigm for a developmental model that would harmoniously integrate social, economic, and environmental factors in space and time. A landscape is a repository of cultural values and documents past civilizations. Thus, a landscape can be viewed as a specific type of heritage (Agnoletti, 2014; Kučera *et al.*, 2008). UNESCO distinguishes three types of cultural landscape, of which a clearly defined landscape designed and created by man is the most easily identifiable. Such a landscape embraces gardens and parklands constructed for aesthetic reasons with monumental buildings and ensembles (Rössler, 2006). Not all designed landscapes are protected by UNESCO. However, they receive varying degrees of protection on the

national level. In the Czech Republic, designed landscapes and landscape gardens are protected as (national) cultural monuments together with castles, manor houses, and follies. Large designed landscapes could constitute Landscape Conservation Areas. Despite their legal protection, designed landscapes often suffer from a lack of management or inappropriate activity and land use.

The study of the appearance of historical landscapes and historical landscape structures is common in European landscape research. Open or easier access to old maps, aerial photographs, and GIS technology enable researchers to study historical land cover and to trace its changes up to the present. Many studies have been performed on the former Habsburg Empire that analyze land cover changes based on old military maps (e.g., Skaloš *et al.*, 2011; Kanianska *et al.*, 2014; Petrovski, Mészáros,

2010) or stable cadastral maps (e.g., Stejskalová *et al.*, 2013; Havlíček, Chrudina, 2013; Skaloš *et al.*, 2012). Stable land cover patches could signal the presence of historical landscape structures (Hendrych *et al.*, 2010).

The identification of landscape values is the key to landscape heritage protection and the appropriate management of the historical cultural landscape. Many approaches to the identification of valuable cultural landscapes have been developed according to the character of the studied landscape. Stable landscape structures have been assessed as valuable (Verešová, Supuka, 2013; Sklenička *et al.*, 2009). Landscape transects have been used to identify valuable cultural landscapes in Slovakia (Slámová, 2013; Chrástina, Lukáč, 2012). Designed landscapes are highly valuable and their identification and protection are important aspects of cultural monument protection. The problem consists of two parts: first, the identification of designed landscapes within the common cultural landscape of a region and second, the identification of the valuable aspects of the designed landscapes themselves. Methods to identify designed landscapes were developed by Kulišťáková *et al.* (2014). Designed landscapes, including their inner structure and compositional values, are identified on maps, and old maps are compared with current maps and ortophotomaps. A list of valuable components is proposed, e.g., castles, follies, tree alleys, and pheasantries. The key components and artifacts include landscape composition, visual and mental connections in the designed landscape, and important points and lines (Kulišťáková *et al.*, 2014; Kulišťáková, 2013; Kulišťáková, Sedláček, 2013). Designed landscapes, parks and gardens are not only cultural but also natural monuments, and old trees and groves represent the primary matrix of landscape gardens and designed landscapes. Old trees and groves also possess cultural value as indicators of former cultivation and the introduction of new species and could be used as landmarks of park composition (Pejchal, 2011; Pejchal, Šimek, 2012). Where other relevant historical material is lacking, old trees and groves could indicate former landscape composition (Nutt *et al.*, 2013).

In the Czech Republic, there are a substantial number of historical parks and gardens, many of which are well documented by historical materials. First, the entire area of the Czech Republic is covered by a detailed series of old maps. Additionally, designed landscapes and landscape parks are often documented by other archival materials, i.e., written and iconographical sources as well as individual old maps. These areas of exceptional value were carefully documented by their founders and owners. During the previous decade, several case studies were performed based on detailed archival research and the valuable aspects of some landscape parks were carefully documented (Šantrůčková, 2014; Lipský *et al.*, 2011; Ivanega *et al.*, 2013; Krummholz, 2012; Pavlátová, Ehrlich, 2004). Most

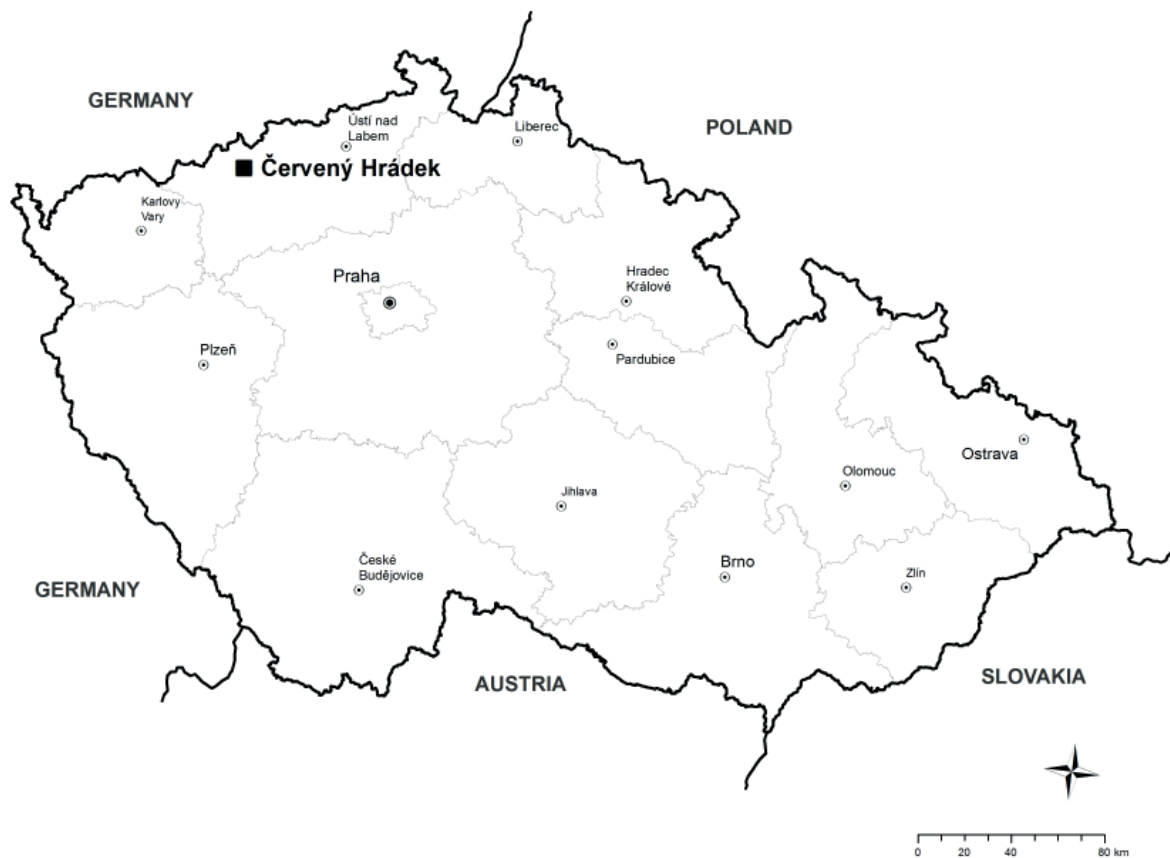
of the carefully studied designed landscapes and parks are in relatively good condition or are located in peripheral areas not endangered by intensive industrial and mining activities. However, the subject of the present case study, Červený Hrádek, is located near the towns of Jirkov and Chomutov and adjacent to lignite mines in the Most basin. This location represents a high risk of endangerment to important cultural artifacts. Therefore, the identification and appropriate management of these artifacts are highly recommended.

MATERIAL AND METHODS

Study Area

Červený Hrádek is one of the oldest landscape parks in Bohemia. Surprisingly, this park is not widely known. Červený Hrádek village is located north of Jirkov in northwestern Bohemia (Fig. 1). The park was constructed in a hilly landscape with interesting terrain forms at the edge of the Krušné hory (the Krušné Mountains) and the Mostecká pánev (the Most basin). The larger part of the park is located on the southeastern slopes of the Krušné hory, and the castle dominates the lower Most basin. The southern part of the study area has been particularly affected by human activities, such as housing construction, recreation and mining. This area belongs among the warmest and driest regions of Bohemia. The average annual temperature is 8 °C, and the average annual precipitation is 500 mm (Tolasz *et al.*, 2007).

The present castle in Červený Hrádek was constructed during the second half of the 17th century to replace the former medieval castle destroyed during the Thirty Years War (1618–1648) by the Hrzánové z Harasova family. The large, four-wing castle was situated at the top of a mild slope oriented toward the east. Below the castle were a Baroque garden with three terraces and a manor farm with vegetable and flower gardens. The main road from the village to the castle led through the Baroque terraced garden. The most important period of the Červený Hrádek gardens commenced in 1777, when Heinrich Franz von Rottenhan acquired the estate and started to landscape the entire cadastral municipality of Červený Hrádek. The Baroque terraces were preserved; however, their character was changed to a less formal appearance. The manor farm was replaced near the village, and the village itself was rebuilt, with new houses constructed for estate officials and craftsmen. In addition, a small poultry farm was constructed near the castle as an ornamental farm. Moreover, the forest north and west of the castle was transformed into a game park and the entire area was landscaped. New park meadows with solitary trees and forest paths were established, the alleys and forest edges were carefully cultivated, and several follies (such as a temple, a waterfall, and a little Switzerland) were constructed. Heinrich Franz Rottenhan died



1: The study area

in 1809, and his daughter Maria Gabrielle Buquoy (born Rottenhan) inherited not only the estate but also her father's keen interest in landscaping. Maria Gabrielle Buquoy initiated changes to the southern lower part of the cadastral municipality of Červený Hrádek around the Novomlýnský pond, adding a new waterfall with several follies (e.g., an English cottage, a fisherman's hut). New greenhouses were constructed near the castle, and the former Baroque terraces were transformed into a pleasure ground (Anonymous, 1914; Bečvář, 2014).

The last private owner was the Hohenlohe-Langenburg family. After 1945, nearly all of the inhabitants from this region were expelled to Germany, and the estate was nationalized. The unity of the castle and the park was destroyed. First, the castle became a home for children and students. Then, it was used as a hospital. In 1990s, when the city of Jirkov became the owner of the castle and a small part of the garden (i.e., the former Baroque terraces), the castle and terraces were renovated and a regional museum and congress center were opened in the castle. The northwestern part of the park, a former game park, became a state forest. With the exception of the temple and Gabrielle's mill, the follies were demolished and the park meadows remain overgrown. The lower southeastern section is in the worst state. Nearly all of the former park was transformed into recreational housing and

a campground with an open swimming pool. Because of the nearby lignite mine, the Bílina river was canalized, which caused significant changes to the terrain and the water regime (Binterová, 1997). Because of these changes and the destruction that occurred during the second half of the 20th century, Červený Hrádek, one of the oldest landscape parks in Bohemia, was nearly forgotten by lay people and experts. However, the park in Červený Hrádek remains an important part of the region's cultural heritage and landscape architecture and could be partially restored.

Materials and Data Mining

The data files for the Červený Hrádek park resemble those for other important parks and gardens in Bohemia. A substantial amount of gray literature was found (Tab. I). Many unpublished papers, maps and pictures are stored in archives and museums (Tab. II).

Methods

Several methods of evaluating valuable historical artifacts in landscape have been proposed. They differ in terms of the selected criteria and the datasets that are used (Sklenička *et al.*, 2009; Black *et al.*, 1998; Van Eetvelde and Antrop, 2009; Capelo *et al.*, 2011; Slámová *et al.*, 2013). The valuable historical artifacts of designed landscapes evaluation that

I: Most important gray literature on the park in Červený Hrádek

Author(s)	Name	Source/Publisher	Year
ANONYMOUS	Červený Hrádek (Rothenhaus) u Jirkova	Světobzor, 3(49):396,398	1869
BEČVÁŘ, M.	Rodina Hohenlohe – Langenburg na Červeném hrádku. Hohenlohové v Čechách, na Moravě a v Rakousku	Chomutov: Tiskárna Akord	2011
BERNAU, F.	Rothenhaus	Erzgebirgszeitung, 12(1, 2): 9–11, 31–35	1891
BERNAU, F.	Schloß Rothenhaus	Comotovia. Allgemeines illustriertes Jahr- und familien Buch für Deutschböhmen, 3: 12–29	1877
DAVID, V.	Immortellenkränze den Manen. Einer der eldesten und hochherzigsten Frauen aus dem hohen Adel im Parke zu Rothenhaus	Prag: Selbstverlag	1863
DUNDRA, J. A.	Wýgimky z historie hradů českých	Časopis českého museum, 13(1): 69–83	1839
HELLERING, C. <i>et al.</i>	Heimatkunde des politischen Bezirkes Komotau, die Gerichtsbezirke Komotau, Görkau und Sebastiansberg umfassend	Komotau: Deutschen Bezirkslehrervereines Komotau	1898
IRZING, F.	Formen unserer Landschaft, in: Heimatkunde des Bezirkes Komotau. 1. Band: Natur. 1. Heft: Landschaft	Komotau: Deutscher Bezirkslehrerverein Komotau	1927
JIRÁSEK, A., BERNAU, B.	Čechy X. Krušné hory a Poohří	Praha: J. Otto	1896
LANGENAUER, C.	Verzeichniss der in den Hochgräflich von Trauttmansdorff-Weinsberg'schen Gartenanlagen, Gewächshäusern & Baumschulen zu Rothenhaus bei Görkau in Böhmen kultivirten Kalt- & Warmhaus-Pflanzen, Perennien, Rosen, Dahlien und Gehölze vom Herbst 1863 und für das Jahr 1864	Brüx: Ferdinand v. Schönfelds Witwe & Comp.	1864
MARTÍNEK, J.	Latinský popis Červeného Hrádku s okolím	Příroda, památky, život, 40(4): 27–32	2008
MEIßNER, A. G.	Historisch-malerische Darstellungen aus Böhmen	Prag: J. G. Calve	1798
NAŇKOVÁ, V.	Červený Hrádek	Chomutov: Vlastivědné muzeum v Chomutově	1974
PENSLER, R.	Geschichte der Stadt Görkau und des Schlosses Rothenhaus	Görkau: Anton Hujer	1928
RUBLIČ, J.	Kláštrec, Červený Hrádek, Jezeří	Československé zahradnické listy, 22(30): 237–238	1925
SEIDLER, F.	Beschreibung der land-, forst- und industriellen Verhältnisse der Herrschaft Rothenhaus	Prag: Gottlieb Haase Söhne	1859
SCHALLER, J.	Topographie des Königreichs Böhmen VII. Saazer Kreis	Prag–Wien: Schönfeldschen Handlung	1787
SOMMER, J. G.	Das Königreich Böhmen XIV. Saazer Kreis	Prag: Friedrich Ehrlich	1846
ŠAFRÁNEK, J.	Povídání o červenohrádeckých lesích	Červený Hrádek: nákl. vl.	2005
TÁBOR, I.	Historické doklady o introdukci dřevin do zámeckého zahradnictví v Červeném Hrádku u Chomutova	In. Symposium 60 let zahradnického výzkumu v Československu. Praha: Výzkumný a šlechtitelský ústav okrasného zahradnictví v Průhonicích, 113–123	1987
WARTUS, F.	Schloß Rothenhaus	Erzgebirgszeitung, 59(7): 81–86	1938

we propose is based on a historical geographical approach. Detailed archival research and knowledge of historical development form the basis of the analyses. Valuable historical artifacts, composition, and dendrological values were defined using ArcGIS software. The data obtained from archives, gray literature, geographical material, and field research were digitalized in a geographical database.

The analysis was performed for areas of one cadastral municipality or less. We distinguished several important periods in the park's design based on historical studies, and a time- and scale-appropriate old map was located for each period. A maximum of three types of designed area/patch were distinguished in the park according to the intensity of the landscaping activities:

- a composed landscape-determining core space,

II: Archival sources for the park in Červený Hrádek

Archive	Collection	Archive files
State Regional Archives Litoměřice	Velkostatek (Estate) Červený Hrádek	Kart. 22; Dom. 10b
		Kart. 24; Dom. 11/11, Dom. 11/3, Dom. 11/4, Dom. 11/5, Dom. 11/7
		Kart. 76; Peněžní hlavní kniha důchodního úřadu panství Červený Hrádek, 1785, 1786, 1787
		Kart. 77; Peněžní hlavní kniha důchodního úřadu panství Červený Hrádek, 1788, 1789, 1790
		Desky 6, Inv. 112/V/L/97; Mappa über die Rothenhauser Revier, Johann Joseph Mann, 1751
		Desky 8, Inv. 113/V/L/98; Geometrischer Grundriß von der Rothenhauser Revier samt denen anstosenden Feldern und Wiesen wie folget, 2. pol. 18. stol.
		Desky 12, Sig. 669; Zámecký park se zahradami, s.d. (1. pol. 20. stol.)
		Desky 1; Situations Plan vom Schloß Rottenhaus und seiner nächsten Umgebung, 1834
		Desky 1; Plan der Gegend von Rottenhaus, Martin Hausknecht, 1820
		Desky 1; Velký plán zámku a okolí, s.d., typ Ehrenwerth
		Desky 4; Plan zur Erbauung einer neuen Wildhüter und Mautners in der Park-Anlagen zu Rothenhaus, K. Hopper, 1873
		Desky 4; Plan zum Ausbau eines Gewächshauses in Wohnungen im hochfürstliche Parke zu Rothenhaus, Josef (Sutfer?), Jirkov, 1900
		Desky 14; Grundriss von Rottenhaus und seinen Park-Anlagen, Karl Knaß, 1844
		Desky 14; Plan der Gegend des gräfl. Buquoischen Schlosses Rottenhaus in Saaßer Kreis, Wachtl Georg, 1822
	Rodinný archiv (Family) Červený Hrádek (Hohenlohe-Langenburg)	Desky 14; Obstdarre im Rothenhäuser Park, J. P. Ritschl, s.d.
		Desky 14; Plan zur Herstellung eines Fischbehälters in Rohenhaus, Böhm, 1841 (?)
		Desky 6, Sig. 529; Karte vom projektiren Thiergarten in Rothenhaus, Kastl, 19. stol.
State Regional Archives Litoměřice, department Děčín	Lesní závod (Forest) Červený Hrádek	Family photos Hohenlohe-Langenburg, počátek 20. stol.
		Kart. 20, Inv. 221; Porostní mapy, 1:10 000, 1. 1. 1960, Zámecké polesí
State Regional Archives Třeboň	Rodinný archiv (Family) Buquoy	Kart. 20, Inv. 227; Porostní mapy, 1:10 000, 1. 1. 1970, Zámecké polesí
		Kart. 224, Inv. 1082, Sig. 260.10; Gabriela hr. Buquoyová (1809–1841). Deníky, Herbářový památník, 1824–1830
		Kart. 224, Inv. 1091, Sig. 262.10; Isabela hr. Trautmannsdorfová – Buquoyová (+1812). Deníky, Korespondence, 1825–1831
		Inv. 1372, Sig. 281.8, Ev. 68; Rottenhanský zámek Červený Hrádek, litografie
State District Archives Kadaň	Historický archiv (Historical archive) Nové Hradky	Inv. 551, Ev. 1585; Jiří Jan hrabě Buquoy. 89 kreseb a skic
		Kart. 609, Sig. 2935f; Soupisy rostlin Červený Hrádek (2 ks)
	Archiv města (Town) Jirkova	Inv. 1070, Mapa 10; Plánek pozemků v prostoru mezi městem a Červeným Hrádkem, 1724 (?)
		Inv. 1073, Mapa 13; Mapa městských lesů, potoka Lužce a kamencového dolu, 1736, J. J. F. Mann
	Sbírka map a plánů (Map Collection)	Waldbesitz der Domaine Rothenhaus, 1927, 1:34560, Sachs
	Sbírka fotografií a negativů (Picture Collection)	Old postcards and photographs

Archive	Collection	Archive files
National Archives	Sbírka map a plánů (Map Collection)	Inv. 712; Situations – Plan des grafl. Buquischen Schlosses Rottenhaus im gewesenen Saatzer Kreise
		Inv. 1441, Sig. B VIII 7/1-2; Geometrischer Gründ Riess des Strittichen Görkaüer Hütten Gezirckhs, J. J. Knittel, 1723
		Inv. 1623, Sig. B XIV 21; Mapka okolí silnic a cest u Chomutova, 1660
	Státní památková správa (National Monument Heritage)	Inv. 229, Sig. 30, Kart. 109; Červený Hrádek u Chomutova
Museum in Chomutov	Picture and Map Collection	Inv. O29, O30, O31, O32, O34, O42, O43, O44, O45, O46; Gustav Schulz, 1853, 1854, 10 akvarelů
		Inv. O33; Červený Hrádek, kresba, papír
		Inv. O164; Červený Hrádek, akvarel, papír
		Inv. O165; Červený Hrádek, 1797, F. K. Wolf, A. Pucherna
		Inv. O636; Červený Hrádek, F. K. Wolf
		Inv. NDa312; Červený Hrádek, kresba, autor neznámý
		Inv. NDa1788; Kopie plánu vodovodní přípojky „Obří hlava“, 1:500, 1940, E. Zappe
		Inv. NDa1790; Kopie katastrální mapy – Červený Hrádek, 1:5000, 1944
National Heritage Institute	Regional Office Ústí nad Labem	Old photographs and postcards
	Directorate-General	Old photographs
	Castle Rožmberk	RO00737, RO00738; Krajina se zámek Červený hrádek u Chomutova, Wachsmann Bedřich, Prag 1856
	Castle Dačice	D-06575; Červený Hrádek - pohled na hlavní a boční frontu zámku, Pohlig J. W., Teplitz, Rau & Sohn
	Castle Horšovský Týn	Inv. HT 3; Červený Hrádek, Karel Postl, 1812
	Castle Hořovice	HO864a, HO888a; Grafika Červený Hrádek HO07002/035, HO07004/006, HO07004/082, HO07005/041; Pohlednice Červený Hrádek
	Castle Krásný Dvůr	KD03410, KD03411, KD03412; Gabrielin mlýn, Wachsmann 1855 KD01141; Gabrielin mlýn, F. Wachsmann 1855 KD01236; Lesnatá krajina s potokem a Gabrieliným mlýnem, M. Wehli KD01145; Pohled na zámek Červený Hrádek, ca 1850 KD01181; Hraběnka Isabela Trautmansdorfová, rozená Buquoy s plány zámku, J. Mathauser 1877
Royal Canonry of the Premonstratensians at Strahov	Library	GS15973, GS16042, GS16043, GS16044, GS18869, GS18889, GS18891, GS32754, GS8352, GS8354; Old graphics

- a composed landscape-developing core space,
- a follow-up space of valuable landscape.

A composed landscape-determining core space refers to the areas of the most intensive landscaping activity, or the oldest areas. The appearance of these patches has been significantly altered by man. A composed landscape-developing core space refers to areas of less intensive landscaping activity. These patches present a more natural appearance but have been recreated by man (i.e., too natural to be nature). A follow-up space of valuable landscape refers to natural areas with scattered designed points (e.g., follies) and lines (e.g., pathways). The shape of each patch in the studied period was drawn on the prepared old map. Based on these partial old maps,

the best shape of each patch was drawn on a final map. The best shape refers to the shape that the patch assumed in a period during which it was well maintained. The final map contains not only these patches as benchmarks of the landscape park but also other important elements of the composition (e.g., axes, vistas, follies) (Tab. III, Fig. 3).

More detailed analysis was focused on the important trees and pathways changes that were performed in the central part of the park. The primary reason for this more detailed focus was that important trees are concentrated in the central part. The outer parts are managed like a forest or are disturbed. Thus, large old trees are not preserved there. In addition, pathway changes

III: Legend of the map of cultural heritage as an example of identified values

Type	Legend items	Map type
Patches of the composed landscape	Composed landscape-determining core space	Map of the entire park
	Composed landscape-developing core space	Map of the entire park
	Follow-up space of valuable landscape	Map of the entire park
	Borders of composed landscape area	Map of the entire park
Legal protection of values	Borders of the cultural monument	Map of the entire park
Disturbed patches	Nearly totally disturbed area	Map of the entire park
Axes	Existing visual connection	Map of the entire park
	Non-existing visual connection	Map of the entire park
	Veduta view	Map of the entire park
Tree lines	Existing alley	Map of the entire park
Pathways	Present pathway	Map of the central area
	Former pathway	Map of the central area
Vistas and follies	Existing viewing point	Map of the entire park
	Non-existing viewing point	Map of the entire park
	Existing building	Both maps
	Non-existing building	Both maps
	Important tree	Both maps (only trees important for the composition appear on the map of the entire park)

were the most significant in the central area. Two levels of pathways were distinguished: the former pathways from the beginning of the 20th century and the present preserved pathways, which remain in use. Tree evaluation was performed by Pejchal and Šimek (2012) and Pejchal (2011). The important trees were distinguished by rarity of species, shape, height, age, trunk perimeter, landscaping value, composition value, and ecological value. All of the information was included in the map (Tab. III, Fig. 4) and accompanied by a written report.

RESULTS

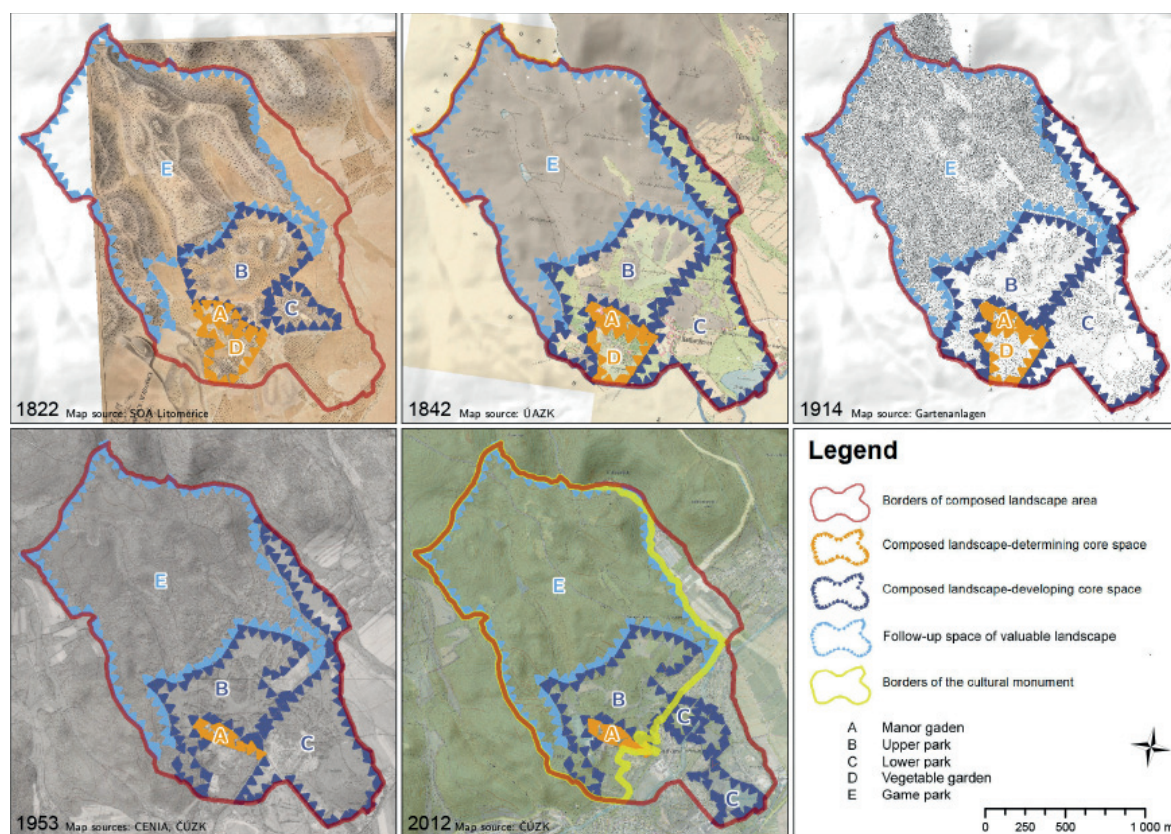
Five stages of park development were distinguished based on archival research and verified by the terrain survey in Červený Hrádek. These stages are as follows:

- Baroque garden and early landscape park established prior to the death of Heinrich Franz von Rottenhan in 1809; the representative map is Plan der Gegend des gräfl. Buquoischen Schlosses Rottenhaus in Saazer Kreis by Georg Wachtl from 1822.
- Landscape park finished by Maria Gabrielle Buquoy; the representative map is a stable cadastral map made in 1842.
- Landscape park in its best state, enhanced by rare species; the representative map was published in a park description (Die Gartenanlagen Österreich – Ungarns in Wort und Bild) in 1914.
- Early stage of degradation in 1950s; the representative maps are aerial photographs from 1953 and a state map (1:5000).

- Present state; the representative maps are an ortophotomap from 2012 and the current state map (1:5000).

The development of five partial park areas was studied in accordance with the distinguished stages. However, not all of the areas were present in all periods (Fig. 2). In Červený Hrádek, two areas of the composed landscape-determining core space (the manor garden and the vegetable garden), two areas of composed landscape-developing core space (the upper park and the lower park), and one follow-up space of valuable landscape (the game park) were identified. The final map displays the ideal shape of each area as it was distinguished on the partial maps, particularly on the map from 1914. Present compositional values and damage were included on this map (Fig. 3). The most valuable dendrological areas were the manor garden and the upper park. Therefore, the dendrological map concentrates on these two areas (Fig. 4). Each partial area was briefly characterized, and suggestions for the management and protection of cultural values were presented.

The core area of the entire park is the manor garden. It is the oldest and most representative part of the castle's surroundings. Formerly, this area was occupied by the Baroque terrace garden, which was landscaped in the late 18th century and transformed into a pleasure ground. Many exotic plants were cultivated in this area, which was decorated with numerous garden features, such as banks, pergolas, statues, and a small orangery. During the second half of the 20th century, when the castle was used as a hospital, the management of this area was less intensive. Shrubs and trees began to invade and overgrow the open meadows. However, the



2: Development of the designed areas in Červený Hrádek park

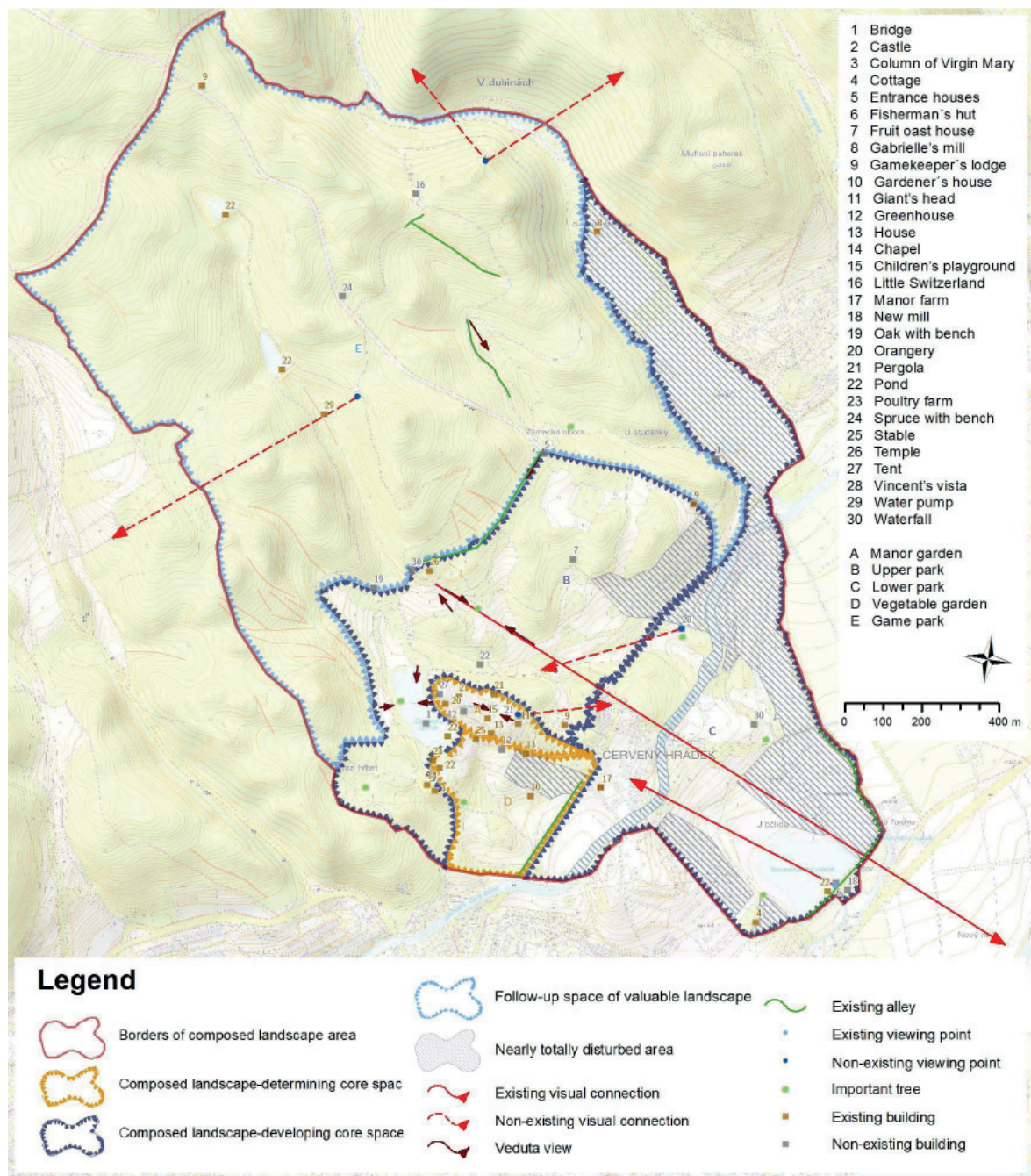
manor garden was never completely abandoned, and during the late 1990s and the 2000s, the castle, the orangery, and the remaining statues were repaired, and the abundant trees and shrubs were cut down. In the future, this area requires more intensive care concentrated on the preservation and reintroduction of rare and exotic plant species. The children's playground and the rough modern wooden pergola should be moved from the meadow directly in front of the castle to a concealed location.

Directly beside the manor garden was the vegetable garden, where vegetables, flowers, and a tree nursery were cultivated. This area was regularly divided into square beds for the practical reason of easy cultivation. A greenhouse and a house for the gardener were constructed there. The vegetable garden was cultivated until the 1940s, after which it was abandoned. Beginning in the late 1970s, new family houses were constructed in the vegetable garden, and now, nearly the entire area has been transformed into family houses and gardens. New housing construction is planned for the remaining areas.

Together with the manor garden, the upper park is the best-preserved section of the Červený Hrádek park. The park was originally constructed in the landscape style of the 1770s. Thus, it is one of the oldest landscape parks in Bohemia. The upper park was completed in the 1850s and subsequently carefully managed until the 1940s. The upper park

consisted of park meadows and woods accompanied by follies (i.e., a temple, entrance houses, and a chapel), ponds, and solitary or grouped trees. There are several circle plateaus with tree rings that could be used for hunting. Today, the upper park is divided into three parts. The first part, which is directly behind the castle with a pond and a chapel, is freely accessible. Less intensively managed, it has slowly become overgrown. This part should be managed more intensively, i.e., the proper care of old (i.e., veteran) trees, the cutting down of overly abundant trees and shrubs, the opening of iconic/veduta views, the construction of new pathways on the traces of former pathways, including bridges over the pond, and the renovation of the chapel. The second part is a fenced game park that visitors are allowed to enter. This part is managed by the Forests of the Czech Republic. In this area, the largest problem is the loss of open space and vistas. Not only have meadows been overgrown by invasive trees and shrubs but also new plantings of European mountain ash (*Sorbus aucuparia* L.) have occurred along pathways and interrupted the vistas. The third, smallest part of the upper park was completely destroyed by the construction of family houses and is not part of the current park.

In contrast, the lower park has been seriously damaged, and only scattered areas are preserved. This part was established by Maria Gabrielle Buquoy during the first half of the 19th century

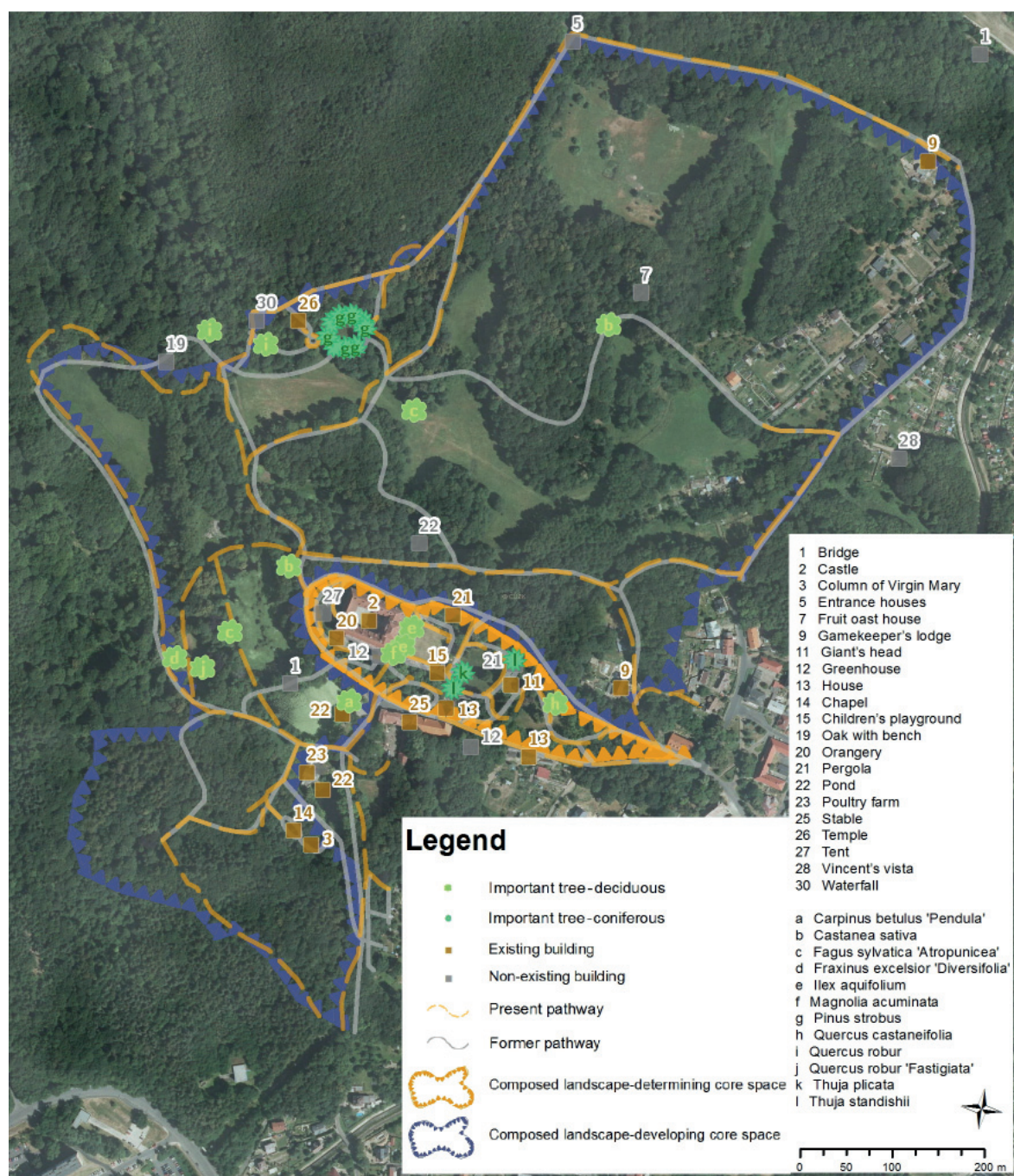


3: Map of cultural heritage and historical cultural artifacts in Červený Hrádek park
map source: State Map 1:5000, © ČÚZK

and consisted of groves and small meadows with follies (e.g., a cottage, a waterfall, a fisherman's hut, banks, and viewing points) as well as fields, pastures, houses, and factories. Červený Hrádek village was incorporated into the lower park, and the nearby town of Jirkov borders on the village. A population increase in Jirkov during the second half of the 20th century caused a significant increase in the town's built-up area. A substantial portion of the park was transformed into leisure dwellings with small vegetable gardens. A campground with a swimming pool was constructed, and another section was

converted into a modern intensive tree nursery. The bed of the Bílina river was artificially remodeled because of the nearby lignite mines. These changes resulted in the complete loss of the original composition, and many follies were destroyed. Only the cottage, Novomlýnský pond, and the remains of the waterfall still exist and should be protected.

The final area is a game park, which was established by Heinrich Franz von Rottenhan at the end of the 18th century and, despite occasional closures, is still used as a game park. Today, roe deer and mouflon are bred there, and the game park



4: Map of dendrological and cultural artifacts in Červený Hrádek park
map source: Ortophotomap of the Czech Republic, © ČÚZK

is managed by the Forests of the Czech Republic. The game park is fenced. However, visitors are allowed to enter by three entrances during daytime. Management in this area should be concentrated not only on animal breeding but also on the protection of the cultural heritage. The old (i.e., veteran) trees do not receive sufficient care, are crowded, and have been incorporated into a common forest instead of being left as solitaires. The meadows should be open. However, young trees have been planted in them. Intensively landscaped sections of the game

park (e.g., the little Switzerland, viewing points) have been left unmanaged and are slowly decaying.

DISCUSSION

Many papers have addressed the topic of the cultural landscape and its values, while focusing on the rural landscape (Agnoletti, 2014; Stejskalová *et al.*, 2013; Skaloš *et al.*, 2012; Verešová and Supuka, 2013; Sklenička *et al.*, 2009; Capelo *et al.*, 2011; Kučera *et al.*, 2015) or the industrial landscape (Chrastina and Lukáč, 2012). Although such landscapes

cover an important share of the land surface, their cultural values are scattered and have been long underappreciated. However, this paper's study area, Červený Hrádek, represents a designed landscape (or a large landscape park; the entire cadastral municipality was landscaped) with a concentration of cultural values. Methods previously proposed for the identification of cultural values in rural or industrial landscape are usable. However, they are insufficient. Methods to identify designed landscapes and their compositional values, including buildings and follies, were proposed by Kulišťáková *et al.* (2014) and Kulišťáková (2013). The usefulness of these methods was demonstrated by landscape studies in Roztěž (Flekalová and Kulišťáková, 2014) and Nové Zámky (Kulišťáková and Sedláček, 2013). The methods are universal and could be applied to any designed landscape because they use only old and current map series, which encompass the entire Czech Republic (e.g., Müller's maps, military maps, stable cadastral maps, and old aerial photographs). However, for a more detailed study, such as this study on Červený Hrádek, many other resources could be investigated.

This Červený Hrádek case study attempts to apply map analysis in the manner proposed by Kulišťáková *et al.* (2014) and a detailed description of the landscape park, such as those of Ivanega *et al.* (2013), Krumholz (2012), and Pavlátová and Ehrlich (2004). For map analysis, not only universal map series (e.g., a stable cadastral map, aerial photographs and a 1:5000 state map from 1953, an ortophotomap from 2012, and a current 1:5000 state map) but also individual maps were used. These individual maps enabled us to present the entire history of the study area's landscaping on maps of the same scale. This method is limited by the availability of appropriate individual maps. In addition, not only map sources but also written and graphic sources were studied, which is time-consuming. Our approach is adequate for important parks and gardens for which there is a sufficient quantity of preserved archival sources, such as for the Červený Hrádek park.

Although the importance of the Červený Hrádek park was demonstrated by archival studies, the

park is not widely known, and its present condition is poor (as was documented by a terrain survey). Červený Hrádek is one of the oldest landscape parks in Bohemia and inspired many other well-known landscape parks, such as Krásný Dvůr (Šantrůčková, 2014). It was carefully maintained, and its importance was appreciated until the first half of the 20th century (Anonymous, 1914). However, after WWII, local ethnic Germans (including the castle's owners) had to leave their homes and were transferred to Germany. The castle and park were nationalized, and ownership of the area was divided among several entities with different needs. However, this situation was common for most large landscaped areas. Several castles became national heritage of the first category and were transformed into castle-museums, whereas many others became, for example, hospitals, schools, or hotels, and their parks slowly decayed. Not only did the castle in Červený Hrádek become a children's hostel and hospital, but the park suffered from irregular management and bordered a large lignite mine.

Lignite mining and industrialization caused immense landscape changes in northwestern Bohemia (Trpáková, 2013). The Červený Hrádek park was not directly affected by mining or industry. However, its pleasure area was selected for recreational and housing use. In result, nearly all of the park's southern region was covered by recreational dwellings, a campground, and a swimming pool and lost its park character. Areas that surrounded the former Červený Hrádek village were built up with family houses, and several dwellings were transformed into family houses during the 1980s and 1990s. The Bílina river was canalized and now flows in a new bed on a high embankment through the southern part of the park. These changes are irreversible and have damaged all aspects of the park: the composition, vegetation, and follies. The northern part of the park is managed as a game park and is in better condition, although it is overgrown. The changes in the northern part are reversible, and this part of the park could be revitalized. Revitalization has slowly begun around the castle building.

CONCLUSION

Methods to identify the cultural heritage values of designed landscapes and their visualization on a map series were proposed using the Červený Hrádek landscape park as an example. The development of the park area is presented on several historical maps. The final analysis was performed for the entire area on a state map (1:5000), on which the park's composition and buildings were drawn, and on an ortophotomap of the central area, on which important trees and pathway-network changes are presented. This method is based on detailed archival research and a terrain survey. Archive files regarding the Červený Hrádek park are collected in several archives and museums. The most important and richest collections are in the State Regional Archives in Litoměřice and the Museum in Chomutov. This detailed documentation enabled us to assess five stages of the park's development and to draw these stages on the time-appropriate maps. All information could be verified by terrain research because the park area is freely accessible.

Our research demonstrated that Červený Hrádek is one of the most important and oldest landscape parks in Bohemia but that its value is underestimated because of its poor condition. In the late 1990s, the castle and surrounding manor garden were restored and opened for tourists and cultural events.

The upper park and the game park remain nearly forgotten and are managed more like a forest and game reserve than a landscape park. The open space has slowly become overgrown. The veteran trees do not receive special care, and the follies are generally in poor condition or have been demolished. However, the upper park and the game park are in substantially better condition than the lower park and the vegetable garden, which were built up with family houses and recreational dwellings over a substantial portion of their area. Despite the serious deterioration, many cultural values were identified in the park. Preserved historical buildings and several follies remain, as well as old (i.e., veteran) and rare trees. The former vistas from the park across the surrounding landscape were destroyed. However, the vistas (i.e., veduta views) inside the park remain. Based on this identification of cultural values, several relatively simple management approaches are proposed to improve the state of the park.

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