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Spatial perception of the "*selva*" through a cognitive cartographic workshop

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Abstract

This research is part of the PRIN 2017 project "SYLVA – Rethink *selva*: Towards a new alliance between biology and artificiality, nature and society, wilderness and humanity", in which, the researchers of the unity of Genoa interpreted the concept of "*selva*" (literally "wild forest") through two different points of view: physical and metaphorical. In this paper we expose the results of a cognitive cartography workshop held in Serra Riccò (Metropolitan City of Genoa, North-Western Italy) where we investigated the perception of the "*selva*" by the locals, maintaining a territorial point of view. We asked the participants first to represent cartographically the places attributable to the "*selva*"; after that, they represented on their mental maps the improvements they would like to make in these places. The participatory workshop has been also useful for the local administration to find ideas about the management of the several rewilded woods in the municipal area. Recently, in fact, forest management has become increasingly linked not only to technical aspects, but also to the emotional aspects of the communities that benefit from them.

Keywords: Cognitive Cartography, Perceptive Geography, Mental Maps, Forest Management, Rewilding, Participatory Cartography

1. The meanings of "*selva*": from literature to environmentalism

The word "*selva*" – from the Latin "*silva*" or forest in English – is defined in Italian as "a vegetal association of spontaneous trees on a considerable extension of land, and the land occupied by this"[1]. It is a term that is widely and mainly used in the literary field that over the centuries has been joined and progressively replaced by the terms "*foresta*" – which comes from the Latin "*silva foris*" and was originally used to indicate the territory where the nobles had the exclusive right to hunt (Pampaloni, Brocada, 2022) – and "*bosco*": from the ancient German "*busk*". The first represents the wild vegetation without, or with highly sporadic, trace of human presence, or if there is it is highly sporadic; the second is used to mean complexes of trees in some way anthropized (such as

[1] https://www.treccani.it/vocabolario/selva/.

chestnut groves, coppice woods, etc.) but it can also take on a fairytale and magical connotation (Varotto, 2017).

"*Selva*" does not only indicate a natural physical space, but also – from Treccani encyclopaedia again – a "very dense and sometimes intricate and confused multitude of things or people", or even urban spaces where social decay, the absence of urban planning and illegal activities can spread (Primi, 2022). This meaning can be traced back to the sense of bewilderment that prevails in many literary characters as they cross the forest (a.g. in the "*Divina Commedia*", in the "*Orlando Furioso*" and in the "*Gerusalemme liberata*"). It is therefore a place of transition and escape that can be perceived negatively, as a dangerous, dark place with ferocious animals, which leads to bewilderment; or positively, when it becomes a refuge, a place of isolation that allows human beings to rediscover their link with nature by distancing himself from the urban confusion.

The relationship of humans with wild nature, not contaminated by human presence, has not always had a positive meaning. It is only towards the end of the Enlightenment period that nature in its pure state – or wilderness – began to be appreciated, frequented, and even associated with feelings close to sacredness, awakened by the contemplation of a nature that is grandiose and superior to human beings (Danowski and Viveiros De Castro, 2017). The myth of the wilderness only fell apart when the rigid spatial separations that persisted in the first half of the second millennium dissolved. This is partly due to the influence of notions such as that of "sublime", inherent in Romanticism, and partly in the American myth of wilderness, which US writers Ralph Waldo Emerson, Henry David Thoreau and George Perkins Marsh – precursors of contemporary environmentalism – have contributed to with their great classics such as, respectively: "*Nature*" (1836), "*Walden; or, life in the woods*" (1854) and "*Man and Nature: or, Physical Geography as modified by human action*" (1864). Before this time, nature was considered beyond the boundaries of civilisation and the term denoted desert landscapes, barren or wild, which aroused more the sense of despair, confusion and terror of falling under the power of the demonic, which aesthetic admiration and religiosity (Danowski and Viveiros De Castro, 2017). Emerson (1991, p. 11) is one of the firsts to consider wilderness as a place that is anything but dangerous: "In the woods we return to reason and faith. There I feel that nothing can happen to me in life, no misfortune, no calamity (provided you let me see), that nature cannot repair". Similarly, Thoreau believed that "there can be no dark melancholy for those who live in the midst of nature and their serene senses" (Sanavio, 2012, p. 193).

In the contemporary era, after decades of rampant urbanism, the inhabitants of European cities have begun to perceive the few remaining "natural" spaces as regenerating environments for the body and mind to be frequented in free time (Dentamaro et al., 2011; Hartig et al., 2011; Hofmann et al., 2012), especially following the Covid-19 pandemic (Baró et al., 2020). As Papotti observes (2020), when the domination of man appears ever more pervasive and ubiquitous, it is natural to reflect on the essence of what we have moved away from. This function of natural spaces in urban or peri-urban areas, however, does not always assume positive and beneficial aspects; in particular where wooded areas have grown spontaneously following the abandonment of rural activities and where public parks are often not maintained. In this case woods could become impenetrable forests where brambles and dense shrub vegetation allow only wild animals to enjoy the territory, as the paths, once crossed by shepherds and farmers, have been rewilded. So, nowadays, people refer either to positive aspects of forests, such as the pleasure of contact with nature and the possibilities of social interaction related to the use of open spaces near the city, or to negative aspects, such as hazards within urban parks, the perception of poor control over the environment and the reduction of personal "comfort" (Carrus et al., 2004).

2. Mental maps as a tool for investigating landscape perception

The so-called "mental maps"[2] – also knew as "cognitive maps" (Tolman, 1948) or "sketch maps[3]" (Hátlová and Hanus, 2020) – have become one of the most used methods by environmental psychology. This method is based on the analysis and collection of the graphic representations of places by the inhabitants and/or users. Initially mental maps were adopted only by psychologists and sociologists but starting from the Sixties and Seventies they began to appear in several research by geographers and urban planners concerning environment-behaviour studies (Gieseking, 2013; Heft, 2013). The first important works of this type were Anglo-Saxon (e.g., Lynch, 1960; Downs and Stea, 1973; Gould and White, 1974); some French research followed suit (e.g., Bailly, 1977; Frémont, 1980). In Italian geographic research, the semiotic perspective has developed, in recent decades, along several paths including geosemiotics, perceptive geography and critical cartography, approached by Farinelli (1992), Vallega (2008), Spotorno (2012) and Casti (2013). The research topics of geography with the use of cognitive maps or mental maps combined with questionnaires mainly concerned the perception of the landscape and urban spaces, often also with the involvement of children and adolescents, as in the case of research conducted in Paris and in various peripheral municipalities by Metton and Bertrand (1974).

The use of these tools allows therefore to investigate different aspects of the human-environment transaction through a view that includes not so much, or not only, the expert look but also, and above all, that of the inhabitants who daily experience the urban environment and its dynamics (Bonnes et al., 2010). Although the mental maps are not objective representations of reality[4], they are extremely effective tools to communicate and to summarize spatial data, and to analyze the relationship between individual behavior and knowledge of lived space (Lando, 2016; Primi, 2017); as observed by Downs and Stea (2011, p. 312): "human spatial behaviour is dependent on the individual's cognitive map of the spatial environment". So, they can be used in various disciplines including geography. Cognitive cartography is an important way for investigating the knowledge and perception of space not only individually but also collectively: some recent example of "participatory mapping" experienced in Italy are: the case of Valchiusella (Piemonte), aimed to integrating the evaluation of cultural ecosystem services into the assessment of wildfire risk through a role-playing game (Vigna, 2022); and also the case of Val Bisagno (Liguria), where laboratory participants worked collectively to produce a flood risk perception map (Primi and Dossche, 2020). In our case, it was chosen to make the participants work individually to avoid that they influenced each other, thus increasing the possibility of getting insights into the expansion of the the *selva*.

Furthermore, Frémont (1980) inserts mental maps in the four perceptual methodologies applied by geographers, together with surveys through interviews and questionnaires, to the analysis of literary works and images disseminated by mass media. Sometimes the concept – especially that of its main instrument, the mental map – could take on different meanings, depending on the interests of the researcher and could be confusing (Breux et al., 2010; Haas, 2004). The results strongly depend on the skills of the respondents: mental maps can be emotional and collect the feelings experienced by the author in relation to the places described; they can be a symbolic map or a map that schematizes the functions and services of a territory. In landscape research, as Rodriguez Gomez (2019, p. 393) points out, a cognitive map: "resembles a topographic map in the sense that it shows the texture and the elevation of a terrain, but its geography is given by the conjectural organization of concepts in an agent's mind". According to Jodelet and Haas (2014), mental maps can also be used to study the social memory of the territory. Moreover,

[2] Often translated with "*cartes mentales*" in French (André, 1989); "*carte mentali*" in Italian (Fiori, 1989).

[3] Term that Burini (2016) defines reductive compared to the form proposed by FAO: "participatory map".

[4] Even though this claim is valid for every kind of map.

they can facilitate communication from the point of view of the subjects involved in the research even when this process is made more complex by linguistic obstacles or by age.

To obtain a good result in the fieldwork, or in the organization of a cognitive cartography workshop, it is considered fundamental to guarantee to all those involved in the research uniform conditions for the design of the mental map (times, environmental conditions, equipment supplied, instructions). Each mental map must be accompanied by a synthetic summary of the socio-personal information. This will be fundamental in the successive analysis phase to evaluate the results of the territorial representation according to social group, age, gender and so on.

3. The mental maps workshop in Serra Riccò (Metropolitan City of Genoa, North-Western Italy)

In our research we decided to apply the use of mental maps to understand how the local community of a municipality in the metropolitan area of Genoa perceive the "*selva*".

With the term "*selva*" we aimed to refer both to woods – maintained or not – which often tend to advance uncontrollably into urban areas, and to abandoned and degraded agricultural areas and pastures that are progressively invaded by bushes, shrubs and woods. At the same time, the meaning attributable to "*selva*" can be varied and contradictory: a place that protects and in which one takes refuge or a place that scares and repels.

Some recent research has focused on the perception of green areas in urban and peri-urban areas (Carrus et al., 2004; Betta et al., 2009) or more generally of the forest (Paci and Cozzi, 2000; Pastorella et al., 2016), using other methodologies. In fact, what forests represent for citizens, the emotional values that they associate with the forest, the perception of the landscape and its changes, are issues of empirical surveys supporting studies of various types (sociological, economic, urban planning, ecological, etc.). With different methodological approaches in relation to their objective, they address the issue of the perception of forests and the values that forests are attributed by local communities (Betta et al., 2009). It is therefore necessary to understand what the needs are, the levels of naturalistic knowledge and also certain psychological aspects of the people living in a given territory (Paci and Cozzi, 2000).

With the support of the Municipality[5] and "Borghi Sparsi" Community Cooperative, the researchers organized a workshop for the citizens of Serra Riccò[6] aimed to analyse the spatial perception of the "*selva*" amongst the population through the production of mental maps. The workshop took place at the Edoardo Firpo Library on two separate days (24th September and 15th October 2021). At the beginning of the meeting, the researchers introduced the research project "SYLVA" and its meaning, with the screening of some landscape photographs (Figure 1) – of abandoned or degraded pastures and woods – of the municipal area.

[5] A Convention is active with the Municipality to collaborate on the project "Innovative paths and recovery of the landscape and of the local economy".

[6] The Municipality of Serra Riccò has an area of 16.2 kmq and has 7,591 inhabitants (ISTAT, 01/01/2022). It is part of the upper Val Polcevera and borders with Genoa. This valley has always been a peripheral area of the city of Genoa, from which it has always depended politically and economically, despite its importance and for the contribution of agricultural products to the city. This relationship has gradually changed over time: in the second half of the twentieth century, during the Genoese industrial development, agricultural activities have gradually almost disappeared to leave space, in the lower part of the valley to sheds and industrial or handicraft establishments and, in the hills, to the spontaneous vegetation that has led to an increase of the wooded areas. At the same time a process of rurbanization and urban sprawl generated by the expansion of Genoa, has reached the municipalities of the Valley, sometimes connecting villages previously separated from each other (Brocada and Primi, 2021).

Figure 1. A typical hut abandoned in the woods of Serra Riccò. Photo by L. Brocada (2021).

Subsequently, the participants were given white sheets in A3 and A4 format, black pens and red pens: the black ones were used for the first phase of the activity which consisted of drawing the territory of Serra Riccò with particular reference to the areas that are perceived as "*selva*"; the red pens were used in the second phase, to represent the elements or areas that the participants would have liked to improve in their own territory or by transforming the negatively understood *selva* into a positively understood *selva*. The map was also combined with a synthetic form to collect the main socio-personal data anonymously. A total of 32 persons participated in the two meetings (4 in the age group under 18; 3 in the 18-35 age group; 5 in the age group 36-50; 15 in the age group 15-65 and 5 persons over 65). The most popular qualification is the high school diploma (14 cases), followed by the middle school diploma (8). Regarding the professional status, 7 employees, 6 retirees, 5 students, 4 workers and freelancers, 2 traders and housewives, 1 teacher and 1 unemployed person participated. Of the respondents, 26 reside in the municipality of Serra Riccò and 16 live in the main hamlet of Pedemonte; the remaining participants are resident in Genoa or in neighbouring municipalities (Figure 2).

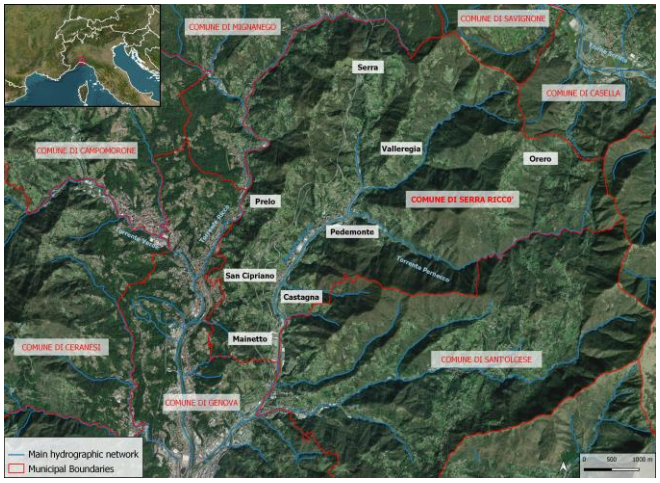

Figure 2. The territory of Serra Riccò, with its hamlets, and a few neighbouring municipalities. Source: QGIS Elaboration by L. Brocada, ESRI Satellite background.

To facilitate the qualitative-quantitative analysis, each individual mental map was examined by reporting in a spreadsheet a series of aspects relating to: type of representation (Figure 3), area represented, number and type of natural elements, anthropogenic settlements and road infrastructures, presence of crops or pastures, presence of animals, type of *selva* deducible from the drawing and changes and interventions desired to modify, preserve or use the forest (Table 1)

Formal aspects of the drawing	Type of representation (plan, perspective, mixed)
Space represented	Location represented and size of the area
Natural elements	Number and type
Anthropogenic elements	Settlements, roads, paths and trails
Primary activities	Crops and pastures, domestic and wild animals
Type of *selva*	Impenetrable, marginal, interstitial/fragmented, expanding
Interventions and desired changes	

Table 1. Aspects found in mental maps. Source: Authors' elaboration.

Figure 3. An example of a plan, perspective and mixed mental map produced during the workshop. Source: workshop organized by the Authors.

4. Analysis of mental maps and results obtained

With respect to the type of representation used, the mental maps are equally distributed among 10 maps with a plan representation, 11 with a predominantly perspective representation and 11 with a mixed representation (orthogonal/perspective/schematic). The scale of representation is mostly very large, as is typical of those who live in and have thorough knowledge of the territory. The orientation is frequently different from the standard one with North in the upper part of the sheet. Only in 7 cases is the entire municipality represented, in 5 maps the Val Secca (the main one of the Municipality) is represented, in the other cases, only a fraction or a few localities are represented. The inhabited centre represented by the greatest number of participants is Pedemonte (8) (Figure 4).

In addition to the woods present in each map and sometimes drawn in a stereotyped manner, sometimes more realistically, the representation of the Secca torrent occurs in half of the cases (16), followed by the Rio Pernecco and other minor tributaries. In fact, as Quaini (2015) observes, rivers are often not simply defined by their flow rate and by the width of the banks but represent flows of historical memories and axes of the mental maps of the inhabitants. In sporadic cases there is a representation of hills and mountains, despite the fact that the configuration of the territory is particularly steep. In 10 cases, no other natural elements appear besides the *selva*. Among the elements of anthropogenic origin, the inhabited centres recur in 27 maps: in 10 cases only one is indicated (with prevalence of the locality of Pedemonte). In the remaining cases up to 9 inhabited centres and hamlets are counted, confirming that in many of the participants there is a good knowledge of a territory that is in fact characterised by the scattered settlement (Brocada and Primi, 2021). The communication routes are shown in 31 mental maps, indicating the main and secondary roads, the provincial road and the A7 highway (Genoa-Milan) as well as paths and bridges; 8 persons drew crops (specifically vegetable gardens, orchards and vineyards) and pastures; domestic animals appear in 4 cases and wild animals in 6 cases, among which wild boars prevail which now in Liguria, as well as in other Italian regions, are increasingly also present in urban areas (Pampaloni and Brocada, 2022).

Figure 4. Three examples of map depicting the municipal seat fraction: Pedemonte.
Source: workshop organized by the Authors.

On the basis of the mental maps, we sought to classify the representation of *selva* into 4 main types, introducing a further subjective point of view which in this case is that of the researchers; moreover, it was taken into account that different types of wooded and vegetated areas can be represented in the same drawing. The *selva* has been defined as impenetrable (11 cases), where it is represented with great density of graphic signs; as marginal (8 cases), when it appears in the frame of the inhabited centre or of the locality represented in the centre of the map; as interstitial and fragmented (17), where its representation is limited to small discontinuous spacing; in 6 cases, based on the comments inserted on the map or in the legend, it was possible to classify *selva* as expanding.

The latest analyses, particularly interesting as they allowed participants to express memories, wishes, reflections and requests to be addressed to the public administration, concerned the interventions that the participants in the workshop proposed to improve certain aspects of the *selva* (represented with the red pen). The most shared theme was the generic one of cleaning of the forest – referred to 17 times – and of the paths (covered by invasive vegetation and brambles), 19 times. Closely related to "cleaning of the forest" are the thinning and selective cutting of diseased trees (5), as well as the transformation of the uncultivated forest into productive woods (timber, fruit and undergrowth products, 14 times). Regarding the spaces undergoing spontaneous reforestation, where once it was usually cultivated on terraces (Figure 5), most of the participants proposed rearranging the dry-stone walls (5) and reintroducing horticultural (9) or fruit crops (6). In addition to this, 3 maps propose to involve the population more through incentives for the maintenance of green areas; in particular: loan for use for the management of abandoned private land – individually or collectively – and more freedom in the removal of material from riverbeds and from forests (wood and stones).

With respect to the paths (Figure 6), a shared desire became evident to restore the ancient mule tracks (known as "*creuze*" in the Ligurian language), adding informative/didactic panels (5) and introducing paths for physical activity (3), possibly also inclusive for the disabled (1). Finally, the theme of land consumption was also touched upon, with respect to which two participants proposed to stop new constructions and to redevelop the existing abandoned ones. Instead, no proposals emerged regarding the management of ungulates.

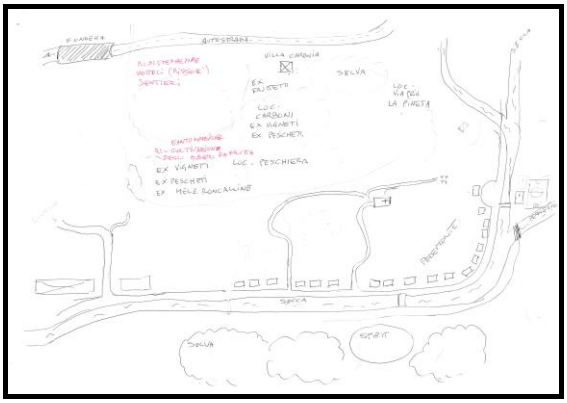

Figure 5. An example of a map localizing old cultivation. Source: workshop organized by the Authors.

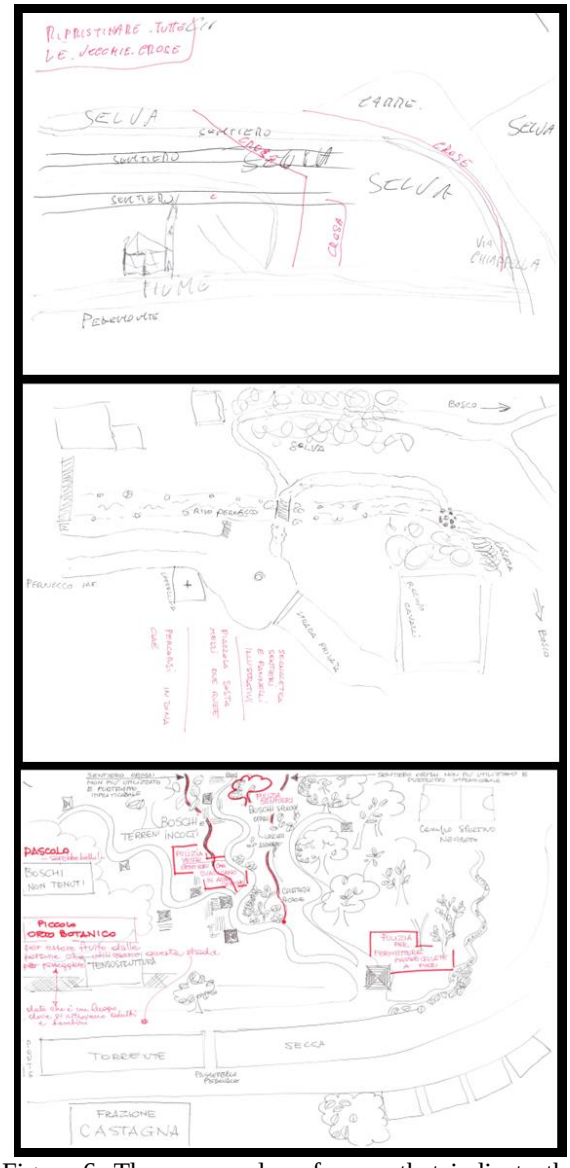

Figure 6. Three examples of maps that indicate the necessity of requalifying paths and "*creuze*". Source: workshop organized by the Authors.

5. Reflections on the use of mental maps as a research tool

Through the analysis of the mental maps of *selva* in the territory of Serra Riccò we attempted to highlight the elements and the configuration of the territory, the meanings and values attributed to them, but also the needs and desires of the interviewees. With respect to the effectiveness of this geographical survey tool, some strengths and weaknesses were revealed. Regarding the positive aspects, the ability of mental cartography to allow respondents to express proposals, ideas and criticisms from members of the local community, associating them with specific places, can be emphasized; a factor that places this methodology ahead of the traditional questionnaire despite the fact that there are computer programs such as "*Maptionnaire*" that are used to carry out questionnaires by geolocating the answers (Dossche et al., 2022).

Another favourable factor is the greater freedom to express concepts and reasoning compared to closed-ended questionnaires or semi-structured interviews[7]. At the same time, the freedom offered by a blank sheet on which to represent the territory and its problems can lead to dispersive results and extremely inhomogeneous interpretations, as it has been noted with respect to the scale of representation and point of view. The use of certain amateur cartographic symbologies and the emphasis on certain elements of the territory rather than on others undoubtedly offers geosemiotic food for thought. In fact, as Vallega (2008) observes, the signs that denote places have two functions: to excite, leading us to construct mental images of the places to which we attribute aesthetic, religious and cultural values and to communicate, as the representation enriches the knowledge of the places and above all inserts them into a vision/conception of the world. A further unfavourable technical factor of the methodology is the costly organisation of workshop meetings such as the one organized in

[7] It is interesting to note, however, that the results of this survey are very similar to those obtained in our other work in this area, where the methodology involved interviews and questionnaires (Brocada, Primi, 2021).

this case study, compared to the actual quantity – and sometimes quality – of sources found (only 32 participants in two days).

In conclusion, the laboratory has been useful for the local administration and for Borghi Sparsi Community Cooperative to find "localized ideas" (Figure 7) for managing the rewilding process in the municipal area and to reconstruct the localization of some old cultivations, and it has confirmed a high interest from locals for rediscovering – through innovative ways – the typical rural landscape lost during the twentieth century.

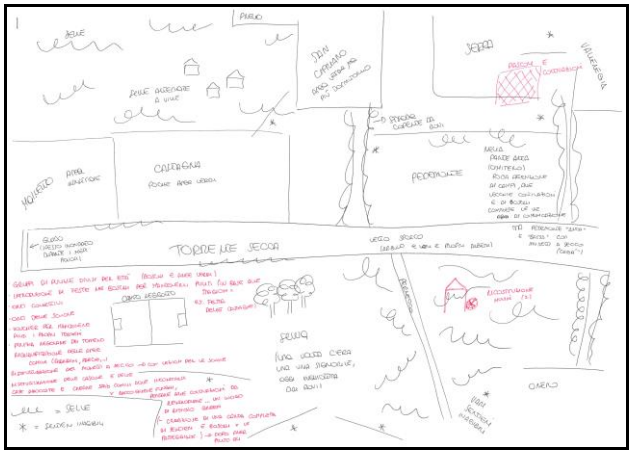

Figure 7. An example of a map with several innovative social proposals from locals.
Source: Workshop organized by the Authors.

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- Even if the paper was devised together by the Authors, L. Brocada wrote paragraphs 1, 3, 4, 5; A. Primi wrote paragraph 2.
- The first author would like to commemorate the co-author Antonella Primi, who died prematurely before finishing the work.
- The research was presented at the international conference "IV Journées d'étude du *Réseau Cartotête* – The social dimensions of cognitive mapping", Genoa, 28-29th October 2021.

References

1. André Y., "Les cartes mentales", in André Y., Bailly A., Ferras R., Guérin J-P. and Gumuchian H. (Eds.), *Représenter l'espace. L'imaginaire spatal à l'école*, Paris, Anthropos, 1989, p. 158.
2. Bailly A.S., *La Perception de l'espace urbain. Les concepts, les méthodes d'étude, leur utilisation dans la recherche urbanistique*, Paris, CRU, 1977.
3. Baró F., Camacho D.A., Del Pulgar C.P., Triguero-Mas M. and Anguelovski I., "School greening: Right or privilege? Examining urban nature within and around primary schools through an equity lens", *Landscape and Urban Planning*, 208, 104019, 2021, pp. 1-19.
4. Betta A., Cantiani M.G., De Meo I. and Maino F., "La percezione del bosco da parte delle comunità locali: un caso di studio nel Comune di Trento", *Forest@-Journal of Silviculture and Forest Ecology*, 6, 5, 2009, pp. 320-332.
5. Bonnes M., Bilotta E., Carrus G. and Bonaiuto M., "Spazio, luoghi e identità locali nelle tendenze recenti della psicologia ambientale", *Geotema*, 37, 2010, pp. 15-21.
6. Breux S., Reuchamps M. and Loiseau H., "Apports et potentialités de l'utilisation de la carte mentale en science politique", *Transeo*, 2-3, 2010, pp. 1-20.
7. Brocada L. and Primi A., "Percorsi innovativi nelle poliferie genovesi. Il caso della Cooperativa Borghi sparsi di Serra Riccò", in Dini F., Martellozzo F., Randelli F. and Romei P. (Eds.), *Oltre la Globalizzazione. Feedback, Memorie Geografiche*, 19, 2021, pp. 623-631.
8. Burini F., *Cartografia partecipativa. Mapping per la governance ambientale e urbana*, Milan, FrancoAngeli, 2016.
9. Carrus G., Passafaro P. and Bonnes M., "Ambientalismo, autoritarismo ed etnocentrismo: una scala di atteggiamento verso il verde urbano", *Bollettino di Psicologia Applicata*, 242, 2004, pp. 3-12.
10. Casti E., *Cartografia critica. Dal topos alla chora*, Milan, Guerini, 2013.
11. Claval P., "Epistemology and the history of geographical thought", *Progress in Human*

Geography, 4, 3, 1980, pp. 371-384.
12. Danowski D. and Viveiros De Castro E., *Esiste un mondo a venire? Saggio sulle paure della fine*, Milan, Figure nottetempo, 2017.
13. Dentamaro I., Lafortezza R., Colangelo G., Carrus G. and Sanesi G., "Valutazione del potenziale rigenerativo di tipologie distinte di spazi verdi urbani e periurbani", *Forest@ Journal of Silviculture and Forest Ecology*, 8, 2011, pp. 162-178.
14. Dossche R., Primi A. and Valle A., "Landscape Services and Their Impact on the Well-Being of Local Actors Through Participatory Mapping. A Case-Study in the Inner Areas of Northern Apennines, Piedmont", in Borgogno-Mondino E. and Zamperlin P. (Eds.), *Geomatics for Green and Digital Transition*, ASITA 2022. Communications in Computer and Information Science, vol. 1651, Cham, Springer, 2022.
15. Downs R.M. and Stea D., *Image and Environment: Cognitive Mapping and Spatial Behavior*, Chicago, Aldine Press, 1973.
16. Downs R.M. and Stea D., "Cognitive Maps and Spatial Behaviour: Process and Products", in Dodge M., Kitchin R. and Perkins C. (Eds.), *The Map Reader: Theories of Mapping Practice and Cartographic Representation*, Hoboken, John Wiley & Sons, 2011, pp. 312-317.
17. Emerson R.W., *Teologia e natura*, (ed. it. Bori P.C.), Genoa-Milan, Marietti, 1991.
18. Farinelli F., *I segni del mondo. Immagine cartografica e discorso geografico in età moderna*, Florence, La Nuova Italia,1992.
19. Fiori M., "Percezione ambientale e carte mentali", in Valussi G. (Ed.), "Friuli-Venezia Giulia: regione problema. Aggiornamenti scientifici e didattici", *Proceedings XXXII Convegno nazionale AIIG* (Grado, 12-16 settembre 1988), 1989, pp. 190-205.
20. Frémont A., "L'espace vécu et la notion de region", *Travaux de l'Institut Géographique de Reims*, 41-42, 1980, pp. 47-58.
21. Gieseking J.J., "Where we go from here: the mental sketch mapping method and its analytic components", *Qualitative Inquiry*, 19, 9, 2013, pp. 712-724.
22. Gould P. and White R., *Mental maps*, London, Penguin Book, 1974.
23. Haas V., "Les cartes cognitives: un outil pour étudier la ville sous ses dimensions socio-historiques et affectives", *Bulletin de psychologie*, 57, 6, 2004, pp. 621-633.
24. Hartig T., van den Berg A.E., Hagerhall C.M., Tomalak M., Bauer N., Hansmann R., Ojala A., Syngollitou E., Carrus G., van Herzele A., Bell S., Camilleri Podesta M.T. and Waaseth G., "Health Benefits of Nature Experience: Psychological, Social and Cultural Processes", in Nilsson K., Sangster M., Gallis C., Hartig T., de Vries S., Seeland K., Schipperijn J. (Eds.), *Forests, trees and human health*, Springer, 2011, pp. 129-170.
25. Hátlová K. and Hanus M, "A systematic review into factors influencing sketch map quality", *ISPRS International Journal of Geo-Information*, 2020, 9, 4, 271.
26. Heft H., "Environment, cognition, and culture: Reconsidering the cognitive map", *Journal of Environmental Psychology*, 33, 2013, pp. 14-25.
27. Hofmann M., Westermann J. R., Kowarik I. and Van der Meer E., "Perceptions of parks and urban derelict land by landscape planners and residents", *Urban Forestry & Urban Greening*, 11, 3, 2012, pp. 303-312.
28. Jodelet D. and Haas V., "Memorie e rappresentazioni sociali", in Palmonari A., Emiliani F. (Eds.), *Psicologia delle rappresentazioni sociali. Teoria e applicazioni*, Bologna, Il Mulino, 2014, pp. 123-147.
29. Lando F., "La geografia della percezione. Origini e fondamenti epistemologici", *Rivista geografica italiana*, 123, 2, 2016, pp. 141-162.
30. Lynch K., *The image if the city*, Cambridge, MIT Press, 1960.
31. Metton A. and Bertrand M-J., "Les espaces vécus dans une grande agglomeration", *L'espace géographique*, 1974, pp. 137-146.
32. Paci M. and Cozzi F., "La percezione del bosco nella società contemporanea: risultati di un'indagine svolta nelle Province di Prato e Firenze", *L'Italia Forestale e Montana*, 2, 2000, pp. 97-110.
33. Pampaloni C. and Brocada L., "Urban wildlife: l'inselvatichimento dello spazio urbano", in Primi A., Brocada L. (Eds.), *Selve urbane: percorsi di ricerca*, Genoa, Genova University Press, 2022, pp. 17-30.
34. Papotti D., "Immaginari geografici e paesaggi letterari dell'Antropocene", in Giorda

C. (Ed.), *Geografia e Antropocene, Uomo, ambiente, educazione*, Rome, Carocci Editore, 2020, pp. 105-119.
35. Pastorella F., Santoni S., Notaro S. and Paletto A., "La percezione sociale del paesaggio forestale in Trentino-Alto Adige: casi di studio a confronto", *Forest@-Journal of Silviculture and Forest Ecology*, 13, 1, 2016, pp. 73-89.
36. Primi A., "The Map as an Instrument for the Analysis, Synthesis and Narration of Migration", in Rania N. and Migliorini L. (Eds.), *Intercultural Relations and Migration Processes*, New York, Nova, 2017, pp. 209-231.
37. Primi A., "Dal labirinto urbano alla selva metaforica attraverso l'ethnoscape. Metodologia e fonti per il centro storico di Genova", in Primi A. and Brocada L., *Selve urbane: percorsi di ricerca*, Genoa, Genova University Press, 2022, pp. 165-184.
38. Primi A. and Dossche R., "Mappatura partecipata e analisi della percezione del rischio alluvionale (Val Bisagno, Genova)", *Bollettino dell'Associazione Italiana di Cartografía*, 169, 2020, pp. 128-144.
39. Quaini M., *Paesaggi storico-geografici*, Genoa, Il melangolo, 2015.
40. Rodriguez Gómez S., "Cartographies of the mind: Generalization and relevance in cognitive landscapes", *Sign Systems Studies*, 47, 3-4, 2019, pp. 382-399.
41. Spotorno M., *La carta è più interessante del territorio? Antinomie geografiche*, Genoa, Genova University Press, 2012.
42. Thoreau H.D., *Walden. Vita nei boschi*, Sanavio P. (Ed.), Milan, BUR grandi classici, 2012.
43. Tolman E.C., "Cognitive maps in rats and men", *Psychological Review*, 55, 4, 1948, pp. 189-208.
44. Vallega A., *Fondamenti di Geosemiotica*, Memoria della Società Geografica Italiana, Rome, 2008.
45. Varotto M., *Montagne del Novecento. Il volto della modernità nelle Alpi e Prealpi venete*, Verona, Cierre edizioni, 2017.
46. Vigna I., "Participatory mapping for integrating ecosystem services valuation in fire risk assessment: a methodological proposal from an Italian alpine valley case study", *Proceedings Conferenza ASITA*, 2022, pp. 583-594.

