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Inclusive coastal landscapes

green and blue infrastructure for the urban-land interface 2

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abstract

Regenerating with the green: a proposal for the coastal landscape of Senigallia

Elisa Conticelli, Simona Tondelli

Abstract

Urban regeneration of a coastal territory should consider the local coastal landscape as a key element for boosting local sustainable growth. Starting from this assumption the regeneration proposal for the coastal belt of Senigallia (Italy) puts a strong emphasis on landscape, which allows to understand the complexity of the coastline's natural and anthropic system in a holistic way.

Senigallia owes its touristic attractiveness to the beach, which is the main touristic reference for local, national and international tourism and the most important meeting place for summer activities and events. At the same time, it shows critical issues such as

Senigallia's maritime landscape (Image author: Ilaria Pasini)

the limited extension in relation with the touristic arrivals, paths fragmentation along the coast and episodes of urban decay. Tourism generates high pressures not only on the beach portions with high concentration of resorts and facilities, but also on those parts that are still predominately wild and less anthropized, undermining the distinctive elements of local landscape.

In this framework, natural areas valorisation and urban quality improvement are assumed as main objectives of the regeneration of the entire Senigallia's coastal strip. The proposal is based on strengthening the green infrastructure along the coast, allowing to improve the quality of the natural and the urban environments by giving continuity to the existing paths along the coast and by connecting the urbanized areas with the local natural systems.

Key Words

Coastal landscape, green infrastructures, urban regeneration

Rigenerare con il verde: una proposta per il paesaggio costiero di Senigallia

La rigenerazione urbana e ambientale di un territorio costiero deve leggere il paesaggio litoraneo come un elemento cardine per lo sviluppo dell'intera fascia costiera. Da ciò consegue il forte accento sulla componente paesaggistica posto dal progetto di riqualificazione della fascia costiera del comune di Senigallia, che permette di leggere in maniera unitaria il complesso sistema naturale e antropico del litorale, assunto a nuova "infrastruttura" cittadina, su cui imperniare processi di riqualificazione dell'intero territorio.

Senigallia deve la sua fama alla presenza della spiaggia, che rappresenta il fulcro dell'attrattiva turistica e il luogo d'incontro per eccellenza delle attività estive, nonostante la sua estensione limitata, la sua frammentazione ed il diffuso degrado urbano. Il turismo rappresenta anche un generatore di forti pressioni, soprattutto su quelle porzioni di litorale ancora scarsamente antropizzate che hanno visto la progressiva riduzione di elementi distintivi del paesaggio.

Pertanto, la valorizzazione degli ambiti naturalistici ed il miglioramento della qualità urbana vengono assunti a obiettivi fondanti il progetto di riqualificazione del sistema litoraneo di Senigallia. Essa si basa sul potenziamento dell'infrastruttura verde lungo il litorale che ha lo scopo di migliorare la qualità dell'ambiente urbano e naturale grazie al potenziamento di reti continue di percorsi in grado di ricucire luoghi prettamente naturalistici fra loro e con il tessuto urbano.

Parole Chiave

Paesaggio costiero, infrastrutture verdi, rigenerazione urbana

Regenerating with the green: a proposal for the coastal landscape of Senigallia

Elisa Conticelli, Simona Tondelli

Introduction

In the last century landscape concept has been experiencing a period of rapid and deep evolution which led to a significant change of the original paradigm. From an idea deeply related with the visual image of the territory and the nature (Cosgrove, 1985), the term has progressively included other meanings recognizing the historical and contemporary importance of community, culture, law, and custom in shaping human geographical existence (Olwig, 1996).

This progressive change occurred not only in the research arena but also in the European territorial policies. Since 1993 the European Union, with the Mediterranean Landscape Charter has considered the landscape as one of the key features of the territorial identity of each country (Voghera, La Riccia, 2016). The European Landscape Convention (Council of Europe, 2000) clearly sanctioned this cultural change by defining Landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (ELC, art. 1). This definition extends the concept of landscape to all territories, not only to those which are exceptional but also to those that are defined as ordinary or even degraded (ELC, art. 2). Each territory is constantly changing; therefore, landscape transformations are inevitable; their result could both enhancing or degrading landscape's original features. Consequently, regeneration and design have been considered as new actions for landscape management and valorization, that support the more traditional landscape policies, commonly based on protection and safeguard. Innovative approaches have further enriched this new perspective, by conceiving the landscape as the core element of territorial policies, and as an opportunity for undertaking a sustainable and resilient spatial development (Voghera, La Riccia, 2016).

In the Italian context the basic idea that landscape is preeminently linked to aesthetic-perceptive characters of a territory has progressively weakened as well (Zoppi, 2003; Clementi, 2002), by converging towards a new perspective, based on its dynamic character: landscape features evolve over time because of natural forces and of the action of human beings, who have always transformed their living environment to meet the changing needs of their society (Antrop, 2005). The new Italian Code of Cultural Heritage and of the Landscape (2004 and subsequent amendments) transposed the ELC by extending the landscape planning object to the whole territory, thus giving a key role to the landscape in current and future spatial planning (Peano, Voghera, 2010). Therefore, degraded urban environments may be regarded and dealt as a degraded landscape that needs to be recovered.

In this framework where 'everything is landscape', the relationship between rural and urban environments takes new prominence, and the new understanding of landscape "cannot focus on the country or on the city but must incorporate the mutual definition and relations of both" (Olwig, 1996: p. 645). An urban settlement and its surroundings can thus be reconsidered under a more holistic perspective, where the city is conceived as a complex landscape, an ultimate human effort for undertaking a complete transformation of a natural environment (Gregotti, 1966).

One possible approach is rediscovering (and reinventing) in a sense what has been already theorized during the XIX century with the Parkways and the Greenbelt concepts (Ignatieva et al., 2011), as well as with the garden city model. These models are based on interrelated open spaces employed in urban areas for offering to the population a variety of opportunities and experiences (Maruani, Amit-Cohen, 2007) related with a high quality urban life. Under this perspective the green is conceived and designed as a unitary urban structure embracing the entire city. The so called "park movement", which was born in the US in the VXIII century for ensuring good presence of green areas in the American cities, has become a landscape planning process developed both at urban and at territorial levels (Collina, 2015).

Moreover, the more general concept of greenways, comprising urban boulevards and parkways as well as green corridors connecting urban and rural territories (Searns, 1995), goes in the same direction: they were conceived as a response to the physical and psychological pressures of urbanization, going beyond recreation to address habitat needs of wildlife, hydrological system management, cultural heritage valorization, and other urban infrastructure goals (Searns, 1995).

This green-oriented perspective gains particular relevance in a maritime coastal landscape which may be considered as one of the most complex systems in the world (Bobbio, Lombardini, 2017). Along the coast marine and terrestrial ecosystems are varied and rich but are also complex and multifaceted environments, with the strong presence of anthropic settlements and degraded areas. In these landscapes the built environment represents a high level of impact on the ecosystem, altering the landscape and interfering with natural processes, sometimes irreversibly (Maruani, Amit-Cohen, 2007). Adopting a green-sensitive urban planning by implementing green infrastructures and open spaces may be an effective approach for maintaining the intrinsic "naturalness" of coastal landscapes and for allowing continuous functioning of the ecosystems.

Starting from these assumptions, this paper illustrates a hypothesis for the redevelopment of the famous coastal landscape of Senigallia (Italy). This landscape emerges as a result from complex and conflicting relationships between natural and artificial elements characterizing the coastal strip of this maritime city, which is still suffering the need for new and more holistic regenerative policies, embracing the entire coastal territory. The regenerative proposal is therefore animated by a vision able to interpret both the natural and anthropic systems as a new, unique urban "infrastructure" in charge of restructuring and revitalizing the surrounding territory. Besides, the project enhances existing green and natural elements, which characterize the original coastal landscape

and are still partially present along the promenades. Under this perspective a new urban planning and design approach has been adopted, where green corridors, natural elements and systems become the new urban infrastructure linking together urban and natural environments, both protecting and increasing biodiversity and rebalancing urban fabrics and natural areas.

Challenges and concerns for coastal landscapes: the case of Senigallia

Coastal landscapes represent territories where the interactions between human and natural elements are closer and more impactful. In Europe, such landscapes have seen their natural elements and ecosystems significantly altered by centuries of human exploitation, due to: intensification of agriculture, loss of traditional and local knowledge, as well as pressure of urban developments, related to housing, transport infrastructure, economic and tourist activities. In recent years, these territories have been particularly suffering the effects of climate change (Hadley, 2009), such as the increasing sea level, coastal erosion exceptional storm surges and flooding, as well as the alteration of coastal habitats. Moreover, most of the world's cultural heritage is concentrated in coastal areas, thus making these territories more fragile in terms of protection of natural and cultural resources.

These processes have progressively led to a loss of biodiversity, climate change impacts, minor quality of life and wellbeing, therefore it is essential to preserve the identity of these landscapes by recognizing their stable set of tangible and intangible components, which are the fundamental bases of the system (Bobbio, Lombardini, 2017), and then to adopt a territorial planning and design approach that considers all these elements through an integrated planning framework (Vallega 2003).

The coastal landscape of Senigallia, a small city located in the Marche Region, just overlooking the Adriatic Sea, has been experiencing these processes and effects typical of coastal territories. Its territory is a Mediterranean coastal landscape which is characterized by the presence of valuable cultural and natural assets and is experiencing negative trends and effects typical of coastal territories.

For several decades the coastal strip of Senigallia has been strongly exploited by a rapid and urban development and a disruptive tourism sector. Indeed, tourism is the most profitable local economic activity of the city, mainly developed along the coast but also spread in the surrounding countryside. In fact, since the inception of the first bath resorts during the XIX century, Senigallia has progressively abandoned its trading past to become a seaside town, thus transforming the original urban pattern according with this new economic vocation.

During the last years, Senigallia has developed several planning initiatives aimed at enhancing natural and cultural heritage of the local territory with an eye for the role of green as important asset for the city and element for establishing new connections along the coast and with the surrounding hills.

To this aim in 2009 the city developed a Green Structural Plan, conceived as an innovative tool for leading an ordered, cohesive and sustainable development of the city, capable of keeping together anthropic environments with ecological elements already present along the coast (Conticelli et al., 2009). Indeed, green urban plans are usually considered as strategic plans for developing and implementing an articulated and composite green infrastructure aimed at: mitigating anthropic and land use impacts on the urban environment; increasing the value of the agricultural land; ensuring a proper use of natural resources and improving the socio-economic development (Collina, 2015).

According with this new green-sensitive planning approach, a regeneration proposal for the entire coastal landscape of the city has been developed. This proposal is based on the previous recognition of different coastal landscapes with proper natural and historic features and values, and consequently on the proposition of regeneration approaches which act differently for what concerns the degraded elements and the contexts affected. Green represents a key infrastructure that characterizes the entire project. It ensures continuity with its presence all along the coast, progressively changing its characters according with the different coastal landscapes in order to highlights specific cultural and natural values recognizable along the coast. Moreover, the proposed green infrastructure permits to connect the coast to the rural inner part of the territory, thus increasing the landscape biodiversity and variety and enhancing livability and quality of the urban environment by encouraging a widespread (and compatible) use of open spaces.

Senigallia's coastal landscapes

Senigallia's seafront shows several distinctive features which are typical of other coastal areas along the Adriatic Sea. As a matter of fact, the city is confined and compressed between the sea and an infrastructural bundle formed by the road system and the railway, serving coastal settlements along the entire Italian peninsula. This infrastructural barrier is broken in some points by the hydrological network running from the internal rural areas to the sea and passing through highly artificialized stretches that have already lost any ecological function for decades.

Along Senigallia's seafront four main local coastal landscapes may be identified. They differ in morphological features, touristic vocation and degree of anthropization (fig.1).

The first coastal landscape (CL1) is characterized by a strong touristic vocation based on seaside tourism and historical and cultural heritage, and high levels of services and facilities. It corresponds to the Marconi promenade, located between the Misa river and the Rotonda, a marine platform with a rounded building on it, which was built in 1933 and became the symbol of the new city's touristic identity.

This part of the seaside hosts also the famous Velvet Beach, which is appreciated by tourists for its golden delicate sand and for the clear sea. The historic city centre with its beautiful buildings and public spaces borders the promenade, further increasing the cultural and tourist importance of this coastal stretch. Consequently, the presence of the most important touristic attractions generates high pressures on the local environment,

especially during the summer.

The second coastal landscape (CL2) is characterized by a touristic and residential vocation where touristic accommodations and services are spread and mixed with residential areas. This landscape comprises the peripheral areas along the coast, just behind the Marconi promenade, and near the coastal part of Cesanella and Marzocca suburbs. Here, residential areas are inserted within a dense urban fabric full of hotels, representing a barrier for reaching the beach. Anthropic pressure on the beach is significant also because of the strong presence of seaside resorts dedicated to local tourism.

The third coastal landscape (CL3) has a naturalistic and touristic vocation. This landscape is characterized by a narrow strip of suburban settlements located on the edge of Senigallia, Marzocca and Cesanella urban centres, just in front of the promenade, and bordered by arable land towards the internal areas of the territory. Here the prevailing land use is residential while the presence of touristic facilities and services is quite low. Wide parts of the beach are left free from any activity, thus keeping the anthropic pressure restrained and allowing to preserve residual dunes, which are typical elements of the local Mediterranean scrub landscape.

The fourth coastal landscape (CL4) is recognizable outside the urban settlements of Marzocca and Senigallia, along the Da Vinci promenade, and near the Cesano river's mouth. This landscape shows an environmental and naturalistic vocation where shore safeguard prevails on seaside tourism promotion. Indeed, touristic facilities are almost absent thus fostering a gradual renaturalization of the beach and of the surrounding areas. Discouraging a massive seaside tourism has preserved the original natural features but has allowed a certain neglect.

The redevelopment and regeneration of the coastal strip lies on the recognition of these different landscapes thus proposing dedicated valorization strategies aimed at highlighting the coastal landscape's peculiar characteristics, and at diversifying urban land uses, to provide a more structured and diversified tourist offer which should be respectful of local natural and cultural capital.

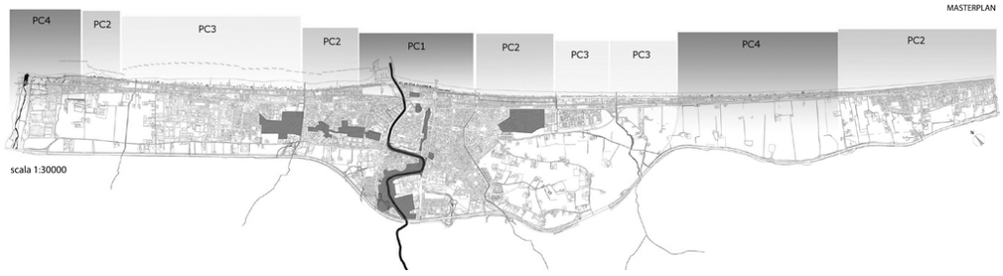

Fig. 1 – Different coastal landscapes along the Senigallia coast

The regeneration project sets also the goal of designing a connected city, where open and green spaces, cultural assets and natural elements are interconnected in a unique system that enhance local peculiarities of Senigallia's coastal territory by establishing and strengthening the links between the urban environment, the surrounding rural areas and the coast.

Therefore, the design proposal aims to provide continuity to the entire coastal landscape by keeping the different landscapes linked together and physically connected through a continuous network of pedestrian and cycle paths, which however are differentiated in each section through the accurate selection of green elements and species, among the ones typical of this part of Mediterranean coast. Indeed, the multiple presence of these four coastal landscapes inspires different green solutions, characterizing and stressing peculiar vocations and natural presences, fostering an intuitive orientation and context recognition of tourists and citizens, while preserving a common thread and continuity of city's urban spaces and coastal environments.

Three projects are discussed below as representatives of specific regeneration approaches and solutions foreseen for three different coastal landscapes (Saiani, 2011). The first design proposal is conceived for an area with a strong tourist and historical - cultural vocation, represented by the Marconi promenade (CL1), the second one is focused on an area with a tourist - naturalistic vocation, with a punctual distribution of services (CL3), while the third one faces the delicate challenge of enhancing an area with strong environmental and naturalistic vocation (CL4).

CL1: Regeneration of the Marconi promenade

The Marconi promenade represent the historical coastal connection between the river Misa and the Rotonda, where the first beach resorts were settled, thus giving a new touristic imprinting to the city. To regenerate this landscape means to give a response to several diversified needs, such as to foster the strong tourist and historical-cultural tourist vocation but also to encourage the introduction of green and more natural elements in a such highly artificialized area.

The design proposal (fig. 2) focuses on a new arrangement of the roadway, which becomes forbidden to vehicular traffic, with the only exception of a dedicated lane for emergency vehicles and for tourist temporary access to the Hotels. Pedestrian and cycle paths are paved with two different materials, respectively wood and stone, aimed at fostering an ordered and safe coexistence of these two means of transport, that are frequently conflicting along the promenade during the summer.

Beside the design of the promenade's paths, green becomes an element for enhancing local landscapes' identity. Therefore, the project proposes to plant a row of domestic pines along the street side nearest the seafront, giving a rhythm to the path, opening the view towards the sea and shading the entire promenade. On the opposite side, *ginkgo biloba cultivars*, with a preference for small-crowned male specimens, are foreseen. Their elegant forms highlight the historical and architectural value of the ancient buildings overlooking the seaside. The changing features of these species during the year have also the power to confer movement and pace to this part of promenade.

The continuity of the wooden path is sometimes interrupted by cuts where green emergencies are inserted to give rhythm to the entire route. Species of rustic *psammofile graminaceous* are proposed in the light of their resistance to foot traffic and to adverse

weather conditions, typical of the marine environment.

To open the view towards the sea, which is currently obstructed by the continuum of buildings and structures of the seaside resorts, the project proposes a reorganization of beach accesses and resorts' layout, with the aim to open more the view towards the sea. Moreover, homogenized architectural features and materials of the resorts' buildings and structures are proposed, to confer an ordered and pleasant perspective to the entire promenade. Temporary buildings are redesigned by using wooden and glass modules, which ensure more lightness and permeability to the eye and a more natural environment on the beach. Modules composition is left free, with the only obligation to leave the access to the beach free to the view.

The Marconi promenade ends in Piazzale della Libertà, a huge square just in front of the Rotonda. Currently it is a wide, empty space paved with asphalt. The project proposes to transform this anonymous space in a new and more appealing place dedicated to leisure and entertainment activities, where people can enjoy meeting each other, where natural features coming from the nearest beach and the green promenade are mixed with more urban spaces and uses. To this aim, this new urban space is characterized by the design of a small hill which slopes gently towards the beach recalling the dune morphology, and green emergencies and wooden pavements, ensuring continuity with the green infrastructure foreseen for the promenade and with the city centre. The presence of a new urban centrality thus ensures a direct connection between the beach and the city

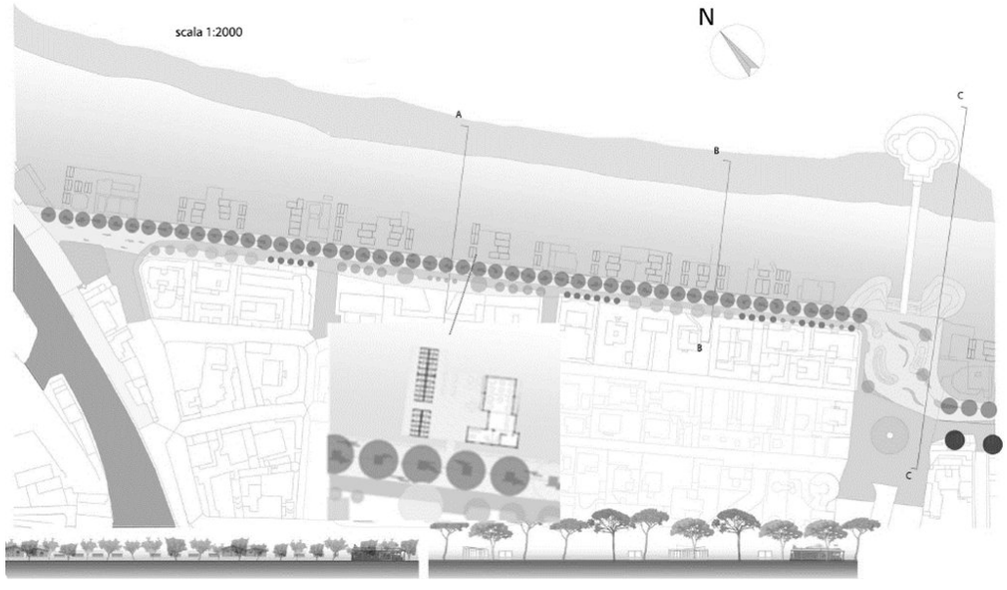

Fig. 2 – Design proposal for the Marconi promenade

CL3: Regeneration of the Mameli promenade

The first 2 kilometers of beach along the Mameli promenade to the Fosso della Giustizia is almost completely sandy and has already a widespread area covered by dunes with

modest height and scattered *psammifile* species on the top.

Therefore, the regeneration proposal (fig. 3) aims to preserve the stable dunes and to re-naturalize the embryonic ones, contributing both to the restoration of the natural environment and to protect the coast from erosion. The idea of strengthening the natural character of the local landscape by fostering the dunes permanence and recreation is also devoted to encourage a more diversified tourism and to enhance and to raise awareness on the natural capital of the local landscape, recognizing and protecting local vegetation species.

For this purpose, the project foresees the establishment of windbreak barriers made of local materials (woven reed mats, woven wicker, etc.) to be fixed on a frame made of chestnut poles and iron wire, arranged in a chessboard and exposed perpendicularly to the prevailing winds. The porosity of the fence is around 40-50%, with empty and full spaces greater than 5 cm, with height and density of the plot that decreases moving away from the line of the marine wing. The disposition of the barriers along the beach is arranged by taking into account the direction of the prevailing winds while the shape of the area delimitated by the natural barriers is inspired by the shells. Within this area, dunes will be recreated and different species of *psammophile* will be planted.

The project proposes to replace the few existing seaside resorts with new temporary structures, conceived to be less impactful to the view and more usable from tourists. The idea is to settle modular buildings where basic services for bathers are hosted (showers, toilets, bars, etc.) ensuring a free but controlled use of the beach, thus discouraging possible careless behaviors and vandalisms. The proposed structures are made of three separate modules that can be assembled or left independently from each other. As for their modularity, they can be easily merged by following different layouts and needs.

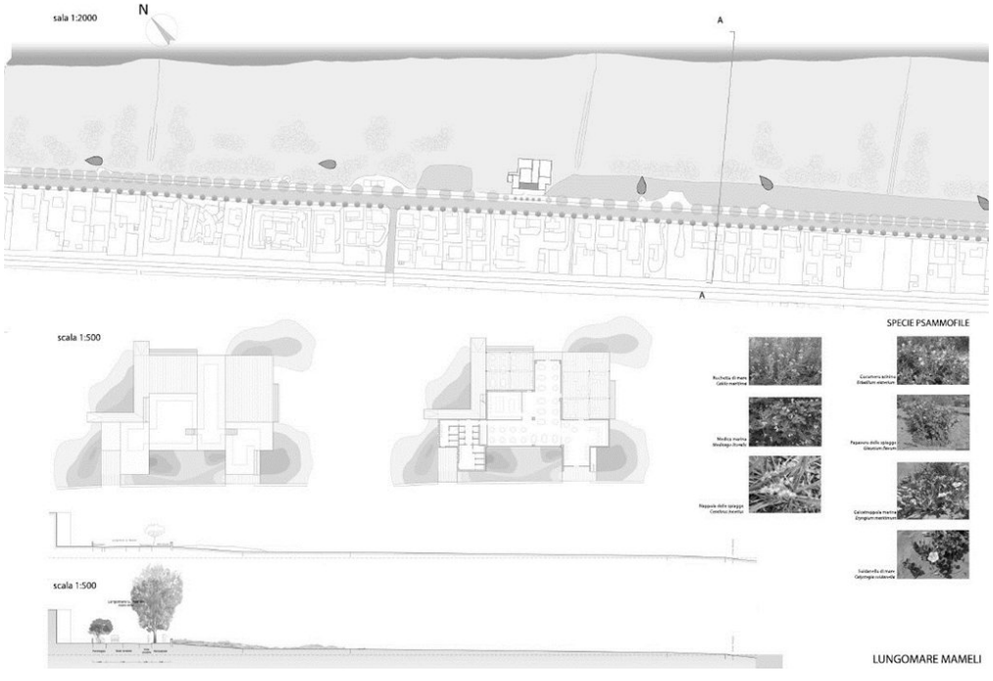

Fig. 3 – Design proposal for the Mameli Promenade

Their roof, partly covered by grass and partly covered with pavement, is left accessible from the outside. Therefore, these structures represent a sort of continuation of the promenade along the seafront, where to experience preferential views of the surrounding landscape and to find comfortable shelters in all seasons, thus also favoring the deseasonalization of the beach use.

Finally, in the ending part of the Mameli promenade near the port, the project proposes to rearrange the road section by using different pavements for pedestrian, cycle and driveway lanes and for parking areas. The road section is completed with a line of domestic pines (*pinus pinea*) on the street side near the seaside and with a line of Juda trees (*cercis siliquastrum*) on the other side, shading the existing parking lots.

CL4: The Cesano river's mouth Park

The coastal landscape located near the Cesano river's mouth is a wide underused area, made by greenfield and sprawled suburbs separated by the railway. Its features are typical of the "Third landscape" theorized by Gilles Clement (2005), resulting from renaturalization processes developed in almost total absence of any human control.

This residual coastal stretch could be the cradle of a new landscape, melting pot of diverse characters instilled by the presence of other nearby landscapes: the anthropized landscape of Senigallia's urban suburbs, the marine environment along the beach, the riparian landscape of the river mouth. These are the three main landcapes brushing this area and their features may be key elements for redesigning a new retrodunal landscape typical of the Cesano's mouth. Indeed, this area represents the ideal environment for developing a new "coastal garden" encouraging the return of the Mediterranean scrub.

To this end, the project proposes to give continuity between the two areas divided by the railway embankment through the creation of passages and tunnels ensuring more permeability for people and animal transit (fig. 4).

The new system aims at becoming a new coastal park for leisure activities respectful of the natural peculiarities. Inside the park, various areas characterized by different types of vegetation (afitoic beach, beach with *psammophilous* vegetation, embryonic dunes, stabilized dunes, shrubland backwaters and coastal jungle) are created throutgh the insertion of small islands, called accelerators of diversity. They are sort of gardens in which *psammophilous* vegetation with high floristic diversity is cultivated in a semi wild state. The mechanical transport action carried out by the wind could also guarantee the proliferation of different botanical species. The promotion of these renaturalization processes can be relevant not only for boosting biodiversity and for restoring the original natural capital but also for promoting educational and knowledge activities with schools and tourists to discover the maritime natural environment.

Where the promenade running along the coast converges in the park, there is an old dilapidated building. The project foresees to replace the old building with a new one, to be used as a refreshment point for those who stay in the park and arrive from the cycle paths. The new building is also equipped with a terrace and a viewpoint with a privi-

leged and elevated view of the area.

The new park is served by a large interchange parking lot, located at the edge of the urbanized areas, and equipped with strips of trees that degrade to and merge into the green of the Mediterranean scrub near the beach. The presence of this new parking area is strategic for its proximity to a shopping center, as the ending point of the network of cycle paths that run along the coastal strip and go back to the hilltop villages, and in the view of the future opening of a new railway station on the coastline as well.

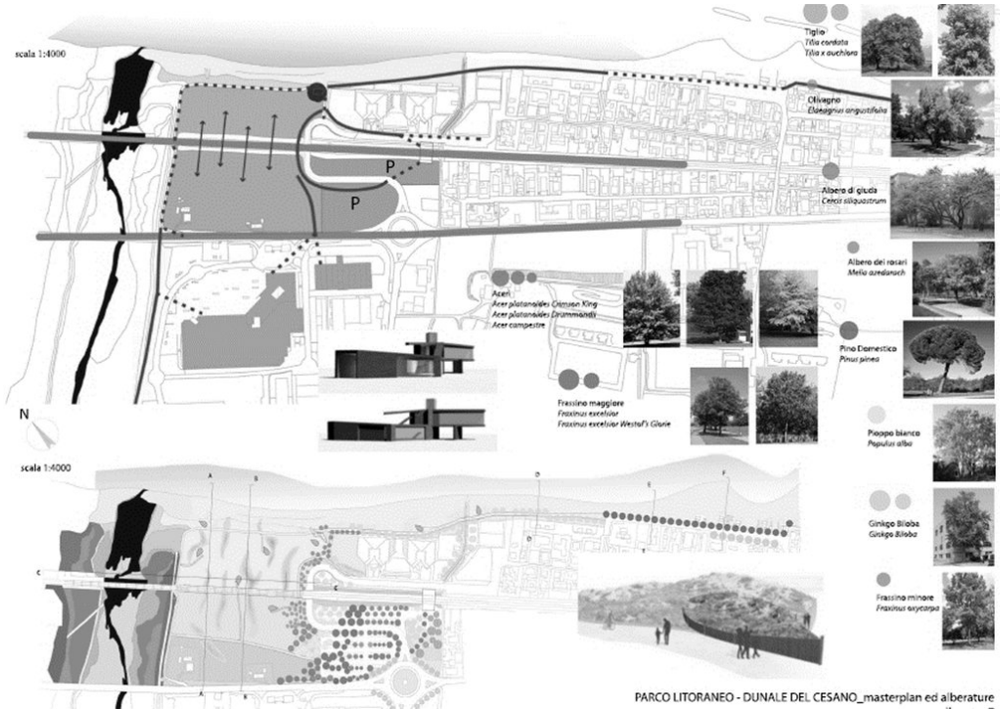

Fig. 4 – Design of the Park of the Cesano's mouth

Conclusions

The idea of using green infrastructures as a backbone for the redevelopment of a coastal landscape arose from the desire to reconcile different objectives. On the one hand the aim of increasing the quality of the whole urban ecosystem, ensuring an effective improvement of the livability and quality of life of the citizens, on the other hand to increase the usability of open spaces, not only the more central coastal ones but also the less used or degraded ones, in the view of promoting a more widespread and differentiated tourist offer along the coast.

The proposed design methodology has been rooted in the recognition of different landscapes, conceived as holistic pictures of diversified urban-natural systems with specific needs, threats and vocations.

The presence of different coastal stretches in terms of intensity and way of using the beach has suggested a different use and development of green. Therefore, the project

has proposed to balance the aim of strengthening the connections along the coast and towards the hills with the need of regenerate and to enhance key places and environments. Green has been the key element of this purpose, being able to sustain resilient infrastructures as well as to enhance urban livability and wellbeing.

Acknowledgments

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Image Sources

Figg. 1-4. Images elaboration by Marco Saiani (Saiani, 2011)

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