Water Architectures in the Alto Guadiana River

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01
2024
SECONDA SERIE

Abstract

Along the Alto Guadiana River, there is a collection of architectures built at different times and with diverse uses whose raison d'être is their special relationship with water. Most of these architectural pieces are today abandoned. This research aims to underline their value, highlight their relationship with water, and reflect on the opportunities they represent, understanding that they are key pieces of the landscape. This article presents a narrative that links the Architectures of Water with the territory and time in an intimate way, a relationship that appears by walking through the landscape, giving them a new meaning. Resignification manifests itself both as a whole, considering the architectures as a collection that informs the landscape, and as individual pieces that can offer opportunities for new forms of balance between humans and nature.

Lungo il fiume Guadiana Alto si trova un insieme di architetture costruite in epoche diverse e con usi diversi, la cui ragion d'essere è il rapporto speciale con l'acqua. La maggior parte di queste è oggi abbandonata. La ricerca si propone di sottolinearne il valore, di evidenziare il loro rapporto con l'acqua e di riflettere sulle opportunità che queste rappresentano, comprendendo che sono elementi fondamentali del paesaggio. Questo articolo presenta una narrazione che lega strettamente tali architetture dell'acqua con il territorio e il tempo – una relazione che si manifesta passeggiando nel paesaggio – dando loro un nuovo significato. La risignificazione si manifesta sia in riferimento alle architetture nel loro complesso, come insieme che contribuisce a strutturare il paesaggio, sia in relazione alle singole architetture, riutilizzabili alla luce di nuove opportunità e forme di equilibrio tra uomo e natura.

Keywords

Architectural heritage, Narrative, Walking, Alto Guadiana, Water.
Patrimonio architettonico, Narrazione, Camminare, Guadiana Alto, Acqua.

Received: *February 2024* / Accepted: *June 2024* | DOI: 10.36253/rv-15625

This article presents a new reading of the Alto Guadiana River landscape (Spain) through the enhancement of its architectural heritage, claiming its incorporation into the landscape as a fundamental element for reaching the holistic vision of 'a life in harmony with nature'.

Along the Alto Guadiana, there is a collection of architectures built at different times and with diverse uses whose raison d'être is their special relationship with water. Most of these architectural pieces are today abandoned or underused. This research aims to underline their value, highlight their relationship with water, and reflect on the opportunities they represent. Within the Kunming-Montreal Global Biodiversity Framework, water architectures represent a key element for an equilibrium between humans and nature, in the past and the future. Therefore, achieving their successful integration and reuse into the existing landscape is fundamental for reaching true equilibrium in the area. So, the main point of this research is the conviction that architectural heritage is relevant and valuable, even more, a key opportunity to achieve a balanced landscape in Alto Guadiana, because its restoration means not only protecting cultural landscape but also ensuring the recovery of local biodiversity and providing secure spaces for the interaction between humans and nature.

This proposal aims to present a narrative that links the Architectures of Water between them, and with the territory and time in an intimate way, providing a new way of understanding them as an integrated whole and, as a consequence, fostering new opportunities for use and a new meaning within Alto Guadiana landscape.

The Alto Guadiana River: The Legend of the River that Appears and Disappears

The Alto Guadiana River flows from the Lagunas de Ruid to lap the outskirts of the town of Argamasilla de Alba, where its stream infiltrates into the subsoil disappearing. It thus feeds the groundwater aquifer of La Mancha Occidental to then resurface in the so-called 'Ojos del Guadiana' in Daimiel. Its karstic nature has raised the century-long legend of a river that appears and disappears, which was tapped upon by Cervantes in the Don Quixote.

In the Alto Guadiana landscape, there are three areas differentiated by the nature of water. Firstly, the Natural Park of Lagunas de Ruidera, which comprises fifteen natural lagoons spread over 15 km, constitutes a landscape of great environmental value recognized as a protected nature reserve. Secondly, the crops spreading from the artificial reservoir of Peñarroya to Argamasilla de Alba, are characterized by large infrastructures that channel and distribute water. Finally, the great plain of La Mancha, shows on the sur-

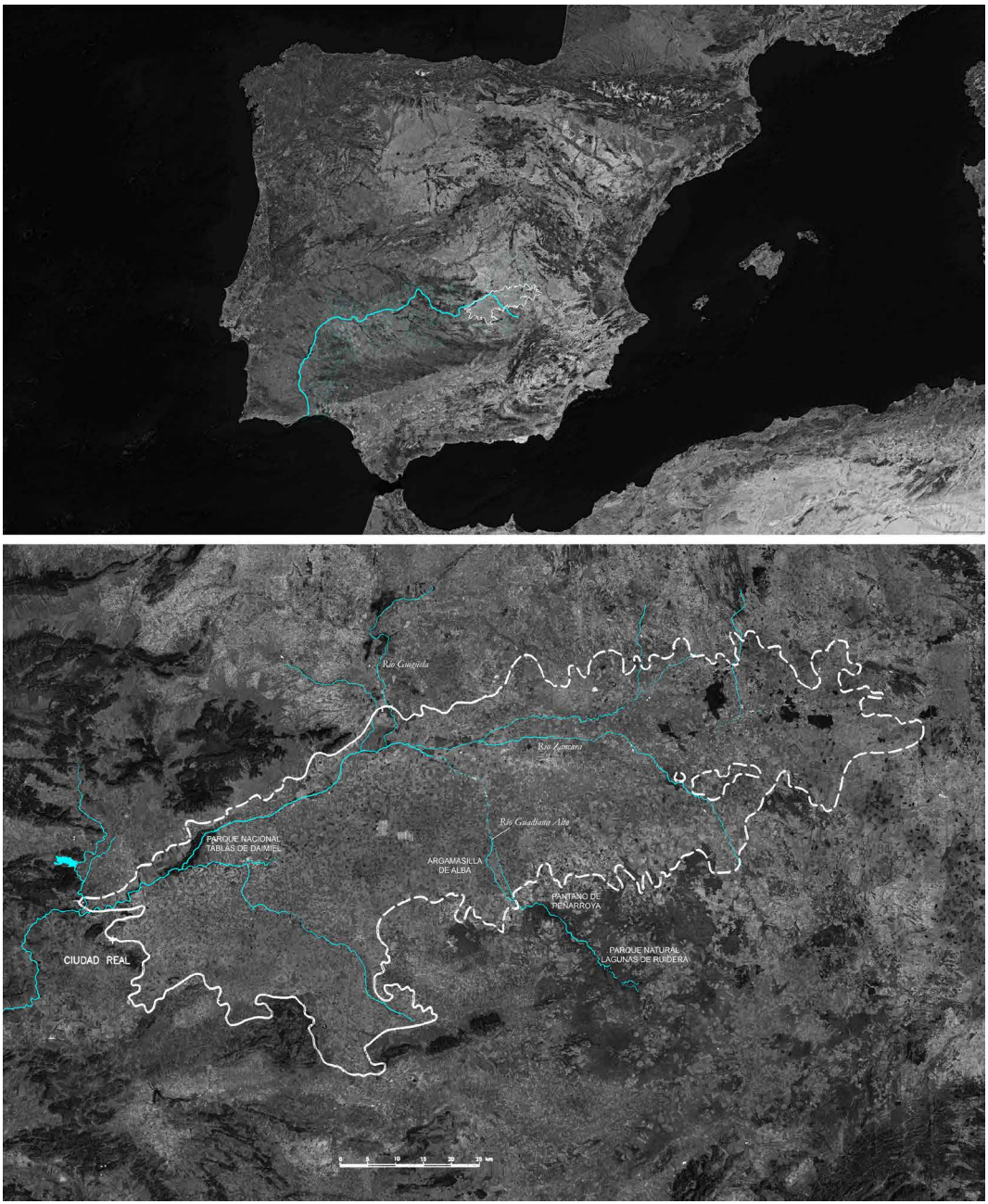

Fig. 1 - Top to bottom: map of Guadiana River basin, Spain, and detail of study area (Ana Isabel Santolaria Castellanos, 2023).

Fig. 2 - Flood in 1972. Guadiana Alto River (Ana Isabel Santolaria Castellanos private archive).

face only the remains of old canalizations and dry riverbeds, while hiding the great La Mancha Occidental aquifer underground. All of this is part of a much larger territory of protected natural wetlands recognized as La Mancha Húmeda Biosphere Reserve since 1981. The waters of Alto Guadiana are characterized by many irregular variations in flow, going from severe drought to large floods and overflows, with consequent disastrous effects on the populations and agriculture in the area. For centuries, engineers have analyzed the causes of the floods that have occurred, have studied the river channels, river dynamics, and the origin of the lagoons, and have proposed numerous projects for their better use. In short, it is a territory characterized by two extremes: "a large area of the La Mancha region unusable for agriculture due to the lack of water, while other extensive regions abundantly endowed with this resource were a focus of pestilence and death due to the stagnant nature of the flows"[1] (González, Marín, 2008, p. 33).

Achieving a balance and controlling the irregularity of the water is the persistent objective that has led man to struggle to domesticate the river water, to control it to make it useful, and at the same time, to make the environment habitable. The different areas of the Alto Guadiana landscape, and their varying degrees of naturalness and artificiality, are a manifestation of this equilibrium on a territorial scale. While water, in its natural form, would provoke serious disequilibrium such as draughts or inundations, the artificial interventions to control it have made it possible to inhabit this territory and to achieve a stable ecological balance benefitting biodiversity.

Domesticating Water

The control of water means the control of life in this territory. Controlling water means the possibility of inhabiting this land. This is reflected in the appearance of a series of architectures or infrastructures, from different periods, built with the purpose of domesticating water: fortified hamlets called motillas, fortifications, mills, fulling mills, hydroelectric plants, dams, wells, canals, bridges, aqueducts... to take advantage of, accumulate, stop, distribute, transfer, cross, or protect water. These verbs are literally man's actions on water and, consequently, on the land-

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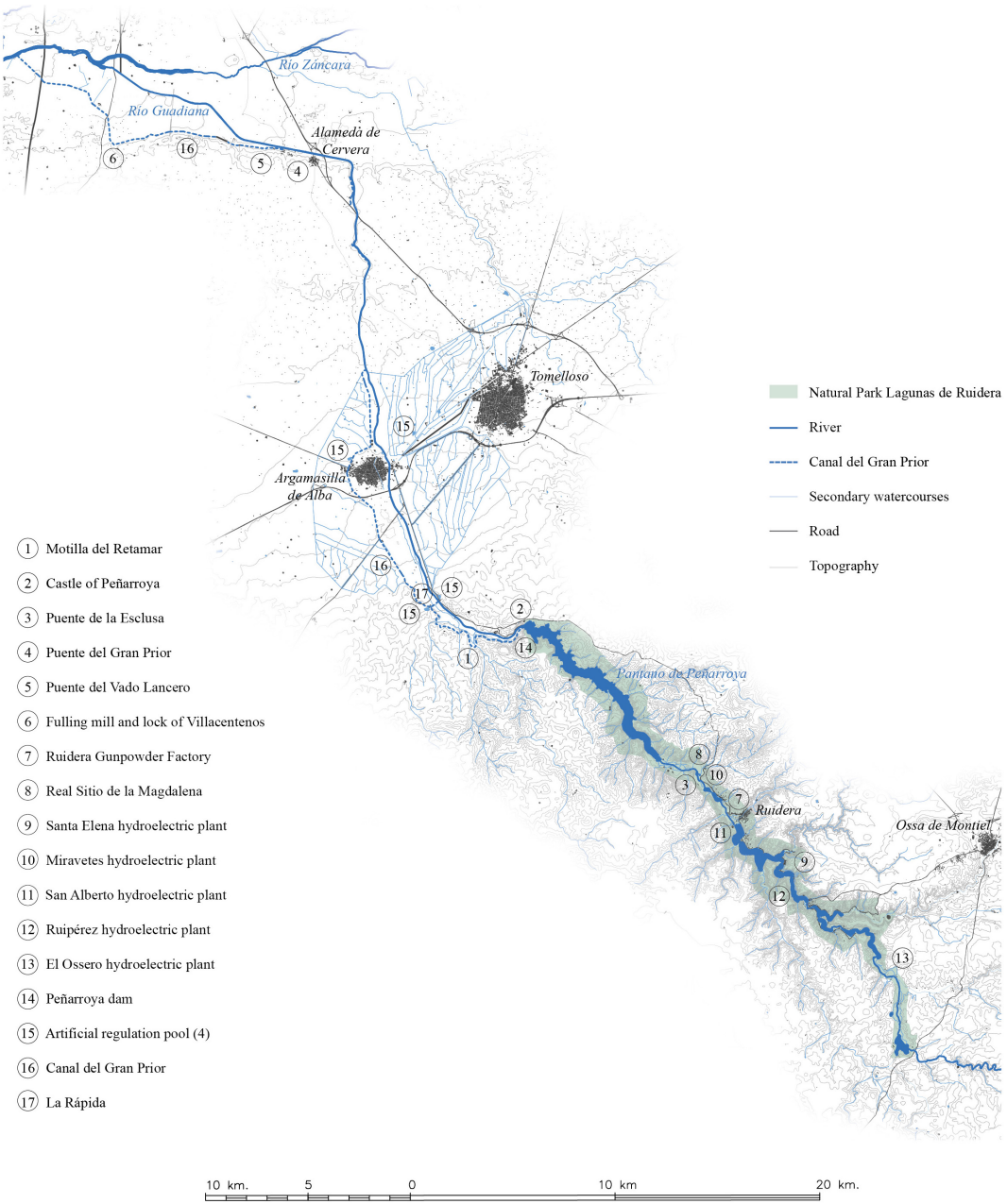

Fig. 3 - Map of the collection of Architectures of Water in Alto Guadiana (Ana Isabel Santolaria Castellanos, 2023).

Architectural pieces	Date	Category/ Tipology	Description
Motilla del Retamar	approx. 2200 B.C. Bronze Age	Motilla	Archaeological site under study.
Castle of Peñarroya	approx. 1230	Medieval Castle	Restored. Now a sanctuary, pilgrimage place and tourist attraction.
Canal of Gran Priorato de San Juan (by Juan de Villanueva) -Puente de la Esclusa -Puente del Gran Prior -Puente del Vado Lancero -Fulling mill and lock of Villacentenos	1781	Canal Bridge Lock	Restored bridges. Mill and traces of canal in ruins.
Ruidera Gunpowder Factory (by Juan de Villanueva)	1782	Industrial building	Only one building remains, now private residence. Other vestiges in ruins.
Real Sitio de la Magdalena (by Juan de Villanueva)	1784	Residential building	Two parallel rows of one-story houses, a plaza and small church. Now private property. Underused, semi abandoned.
Mills (flour and grain) and fulling mills (textiles)	Various	Mill	Total ruin.
Hydroelectric power plants: Santa Elena, Miravetes, San Luis (disappeared), San Alberto, Ruipérez, El Ossero	1902-1976	Industrial building	Industrial architecture buildings totally abandoned.
Peñarroya reservoir and dam	1959	Infrastructure	In use.
'Modern' canalizations: 4 artificial regulation pools, canal, subway pipes	Present	Infrastructure	In use. Some old canals and buildings left abandoned.

Tab. 1 - Classification of the collection of Architectures of Water in Alto Guadiana (Ana Isabel Santolaria Castellanos).

scape, which are turned into the form of architectural pieces. Thus, the architectures erected in this landscape, those still standing, tell us the story of man and water, and the balance between both forces.

The first evidence are motillas, Bronze Age fortified constructions characteristic of La Mancha. In a climatic period of extreme aridity and prolonged drought, their main purpose was the control of water using deep wells and hydraulic structures that monitored the water table level (Mejías et al., 2015). They are located in flat areas, close to the river or easily flooded in the Guadiana basin, like Motilla del Retamar. The motilla meant survival, an attempt to equilibrate the extreme natural conditions.

Medieval fortresses, however, were established by military orders to fight for the control of land and water. This is the case of the Castle of Peñarroya (Benítez de Lugo et al., 2007), located in a strategic mili-

tary enclave at a natural strait of the river. Thus, the fortress meant power and control over water and people depending on it. Since the Middle Ages, the banks of the Alto Guadiana have been dotted with mills that took advantage of the strength of water. In this case, mills represent balance since water was a source of energy that could improve the conditions of life. With this same purpose, the project of the Canal del Gran Priorato de San Juan was started, as an Enlightenment attempt to modernize and make La Mancha fertile (Fidalgo et al., 2022). The royal architect Juan de Villanueva designed a canalization of 65km from the end of the lagoons up to the Záncara River, the new royal Gunpowder Factory in the Ruidera lagoons (Sevillano, 2021), and a new village named Real Sitio de la Magdalena (Moleón, 1988), for the workers. This irrigation system would improve agriculture, and by extension, the living conditions of the region's inhabitants. So, the purpose of the project itself was to bring some equilibrium into the territory, trying to profit from the extra water from the lagoons by channelling it to the dry areas of agriculture.

At the beginning of the twentieth century, six hydroelectric power plants were installed in the Alto Guadiana landscape to take advantage of the driving force of the lagoon waterfalls to produce electricity. Although some of them were built reusing old mills, in general, the power plants were built in the waterfalls between lagoons to get an optimum profit of water, therefore, damaging the natural travertine barriers that create the lagoons and make them so unique. Profit of water turned into exploitation, in an unbalanced manner, since one force (man) was damaging the other (nature).

In 1959, the Peñarroya dam and reservoir's construction started. The aim of this artificial reservoir is to accumulate the extra water from the lagoons, controlling the volume of water flowing through the dam, and therefore, avoiding overflows and serious floods, but also seasonal draughts. Again, the purpose itself is to equilibrate the natural irregularities of the river which caused so much destruction. Nowadays, the current underground irrigation system of this area follows the same strategy. The aim is to re-

Fig. 4 - Left: Motilla del Retamar (Mejías et al., 2015). Right: Canal of Gran Prior (Díaz-Pintado, 1997).

spect and take care of the natural environment while developing optimized irrigation systems for agriculture.

Although there is no doubt of the individual relevance of some of these constructions, especially in historical terms (Marín, 2007), this article focuses on their value as a whole and their potential as a collection of pieces intimately linked to the passage of water through the territory. This is not so obvious. The motillas are now an archaeological site under study, and the Peñarroya Castle is a local attraction, however, the rest of the architectural and infrastructure constructions that remain are underused or abandoned in the wilderness. The remains of Juan de Villanueva architecture are almost unknown. The former buildings of hydroelectric power plants have been dangerously abandoned since closing in 1976, and kilometres of old canals have been left unused in the territory. Therefore, reusing these architectures and giving them a new meaning, is a way of harmonically integrating nature, history, and human activity in the landscape.

A Timeline and a Waterline. Landscape as a Collection

The landscape of Alto Guadiana is composed of a constellation of natural and artificial elements linked by the course of water. The river is a line drawn on the territory that weaves together the architectural interventions. Thus, it becomes the guiding thread of the landscape and the collection, which gives meaning and relates all the pieces to each other. If we could pull up the river as a plant, these architectures would come out with it attached to its roots. Evidencing, once again, that they are not only part of the territory but also shape its landscape.

The idea of interpreting the landscape as a collection, which is central to this research, is developed by Günther Vogt in Landscape as a cabinet of curiosities. The reference to Pessoa's poem – "I saw that there was no Nature; that Nature does not exist; that there are mountains, valleys, plains; that there are trees, flowers, grasses; that there are streams and stones; but that there's not a whole to which this belongs. [...] Nature is parts without a whole"[2] – leads him to conclude that "if there is no such thing as nature as a whole – perhaps there is landscape as a cabinet of curiosities. [...] What is required for this kind of reinterpretation is an attentive observer who collects the various phenomena as individual elements, relates them to each other, and rearranges them [...]. The cabinet of curiosities is a personal collection that others can look at" (Vogt, 2015, p. 211). In other words, this interpretation consists of observing 'nature' to discover the relevant pieces of a particular landscape, selecting them and working with them as a network. The association among the collection pieces is essential since it "creates new orders and relationships that allow new ways of looking at things" (Vogt, 2015, p. 214). The way of looking at things is, precisely, what reveals a new meaning in them. When approaching a landscape proposal this is central, since the word 'landscape' has implicit in its definition to establish a particular look on nature or a fragment of it[3].

Under this perspective, the Alto Guadiana River becomes a trace in the territory that is at the same time a line of water and a line of time. The riverbed becomes a link in space and time that connects a collection of water architectures, each one belonging to its own era and responding to a specific need, from the

Bronze Age to the present day. That same line of water keeps them anchored to the present and allows us to admire a landscape whose architecture manifests the best of each era. It invites us to make another reading of built heritage, it is not only about what it was but also about what it is now and what it could be in the future. This opens the door to the power of the project: what these sites can become and how these architectural pieces could be reactivated. As per Vogt, the project appears and develops out of the ways of looking at things

A Walk Through the Landscape

This proposal pretends, in the first place, to make this landscape collection visible, and the argument that links all the pieces together understandable. The guiding thread is a narrative about humans, water, and time that is contemplated through the architectural remains, when walking through them in situ as an open-air exhibition. Thus, the reading of this landscape collection materializes in a 'walk', which is the framework that holds all the architectures together. It is while walking through the landscape, that the

Fig. 5 - Collection of Water Architectures.
Top to bottom:
Peñarroya castle and dam, before (Benítez, 2007) and after (Ana Isabel Santolaria Castellanos, 2023).
Power plant of Sta. Elena, before and after (ruideratreasures.es).
Power plant of El Ossero, before and after (ruideratreasures.es).

relationship among the architectures and between these and the water appears before us. This idea is beautifully expressed by Robert Smithson: "walking conditioned sight, and sight conditioned walking, till it seemed only the feet could see" (Careri, 2014, p.100). Precisely Robert Smithson and his Tour of the Monuments of Passaic (Smithson, 2018), is a clear example of how a narrative can turn the outskirts of a city and the abandoned industrial remains by the Passaic River into 'monuments'. All it takes is Smithson's singular sight captured in his photographs and accompanied by his narrative to see these 'monumental' pieces of architecture. The Monuments of Passaic, like the Architectures of Alto Guadiana, are there; one only must know how to look at them as such.

This eye-opening narrative can be read in paper, like Smithson's Tour. But, especially in a place like Alto Guadiana, landscape is revealed to us by 'real' walking. The discourse is revealed as a walk, in a "meandering way of conversing" (Vogt, 2015, p. 216). Thus, the exhibition of this collection of Architectures of Water is within the landscape itself, and the way to read it is by walking through it. This 'walk' would become a signalised path that allows the tour along the water line, passing through – and visiting – each of the architectural pieces that make it up. In fact, many sections of the abandoned canalizations could serve, themselves, as the walking (and cycling) 'path' proposed, recovering – physically and metaphorically – their original function of connecting.

This interpretation of landscape, centred on a collection of water architectures linked by a walking path following the line of water, restores the value of architectural heritage, and their equilibrated relationship with the landscape they belong to.

Opportunity: Respectful Reactivation of the Built Heritage

This territory crossed by the Guadiana watercourse in its different forms has a great natural value. Especially the Lagunas de Ruidera are an exceptional geomorphological landscape that has been slowly bioconstructed over hundreds of years, with a unique biodiversity of native flora and fauna. On the other hand, water is an essential natural resource for the supply of the towns, irrigation, and agricultural activity. It has meant industry, population, history, and culture. It is an inhabited landscape. And to inhabit it means to leave traces, in this case, in the form of constructions. However, the problem is not 'inhabiting a landscape', but doing so irresponsibly. In Lagunas de Ruidera, deterioration and contamination appeared in the sixties with the beginning of uncontrolled tourism (Díaz-Pintado, 1997). Urban speculation, deficient sewage systems, and the impact of tourism caused a serious deterioration of this natural space and its biodiversity. The equilibrium between

Fig. 6 - Above - Monuments of Passaic: (left) Monument with Pontoons. The Pumping Monument; (right) The Fountain Monument. Robert Smithson, 1967 (holtsmithsonfoundation.org). Below - Architectures of Alto Guadiana: (left) Pressure chamber of Ruipérez power plant (ruideratreasures.es); (right) Canal of Gran Prior after Peñarroya dam (Ana Isabel Santolaria Castellanos, 2023).

humans and nature was lost. To restore it, the municipal administration achieved the recognition of the area as a Natural Park in 1979.

Forty years later, the situation has changed. A large part of the lagoons, the travertine barriers, and the biodiversity of flora and fauna have been recovered, and efforts are being made to control tourism. However, real balance is not yet achieved. To protect the environment, very restrictive building codes prohibit new constructions. This is detrimental in the case of the architectural heritage that has been abandoned, deteriorated and condemned to ruin as the cause of landscape deterioration. However, disregarding and abandoning the built heritage – or even demolishing it – only causes more unbalance and damage to the natural environment. To achieve the ideal of 'living in harmony with nature', it is necessary to restore the relationship between water and humans that this heritage represents, as an integral part of the landscape of Alto Guadiana.

Taking advantage of the built heritage and prolonging its useful life, when possible, is the first and simplest strategy of sustainability applied to architecture (Austin et al., 1988). Especially in a protected site such as this one, heritage must be understood as another resource, and it needs to be reused with max-

Fig. 7 - Left: Casa del Semáforo. Project by B01 architects (ondiseno.com). Right: Almadraba in Nueva Umbría. Project by Sol89 architects (photo: Fernando Alba).

imum efficiency and maximum respect for the natural environment. Under this perspective, this research proposes to reuse the Architectures of Water, giving them a new meaning, not only by connecting them in a landscape collection and part of a walking tour, but also bringing life into them. All the constructions mentioned can incorporate new activities related to nature and human interaction with it, with minimal intervention, that would enrich and emphasize the narrative of landscape. In this sense, the different areas of Alto Guadiana, previously described, require diverse uses and degrees of architectural interventions.

Some relevant cases illustrate this idea. First, the intervention project on the beach of Prat de Llobregat (Barcelona), a protected area of natural marshes, to recover two historic military buildings in ruins: the Cuartel de Carabineros and Casa del Semáforo. The project consists of 'cleaning' and consolidating the ruins, adding a wooden walkway that runs through them as a kind of landscaped 'architectural promenade'. This minimal intervention has made it possible to convert them into a birdwatching observatory, as well as a walking route, without modifying the perfect relationship of the ruins with the beach, even more, allowing the viewer to contemplate the birds, the beach, and the architecture. A similar strategy is applied in the restoration project of the Real Almadraba on the natural and protected beach of Nueva Umbría (Huelva) by Sol89 architects. The intervention recovers the industrial buildings, thus revealing the patrimonial and ethnological heritage of this coast. It is completed with a new pedestrian path that joins the two banks in the form of a reversible installation made of wood that gradually enters the terrain. Both projects intervene in unique natural landscapes with special protection, and both recover heritage pieces offering the visitor a new experience of nature, without damaging it.

On a smaller scale, the project of Carles Enrich Studio in the ruins of Jorba Castle (Barcelona), and the surrounding landscape adaptation is remarkable. The intervention consists of consolidating the archaeological excavation by adding an itinerary, and especially, the covering of the central space with a lightweight laminated timber structure. It could be considered like acupuncture, acting only in strictly necessary points.

In a further step, nature itself could conquer the heritage ruins, but in an intentional and designed way. That happens, for example, in the botanical gardens inside the S'Hostal quarries of Menorca, a former quarry of marés limestone that has been reused creating a complex of gardens to conserve the natural flora of the site, with musical and artistic events happening within. In both cases, heritage becomes liter-

Fig. 8 - Jorba Castle. Project by Carles Enrich Studio (carlesenrich.com).

Fig. 9 - Bird's Palace, Amsterdam. Project by Studio Ossidiana (studio-ossidiana.com).

ally the framework for the renaissance of nature, by means of human design and allowing its enjoyment.
Finally, the work of Studio Ossidiana represents how architecture installations made by humans can enrich natural life for other animal species, which are only to be observed. The Bird's Palace project in Vondelpark (Amsterdam) is a floating garden anchored in a pond conceived as a "space for the encounter between the birds (native and non-native, feral and wild) and the people of Amsterdam". A place to be observed, visible from the shore, "to be experienced as a birdwatcher, with binoculars or cameras". Birds feed, play and disperse other seeds, fertilizing the ground and "becoming the gardeners of the floating island"[4], somehow functioning like a miniature ecosystem.

Landscape Resignification

Three main ideas summarize this research, whose main purpose is to build a new narrative that links together the Architectures of Water and becomes visible to the observer who walks through the landscape. Resignification manifests itself in two scales. The Architectures of Water gain a new 'comprehensive' meaning, as a collection, taking part in the landscape discourse and becoming relevant pieces of it. Furthermore, each of the constructions gains a new 'particular' meaning, since they can be reused, opening the door to new opportunities.

Firstly, it is important to recognize the value of the architectural heritage built along the Alto Guadiana River, and how these reflect the equilibrium of forces between humans and water throughout history. Reading landscape as a collection of architectural pieces provides a new way of understanding them as an integrated whole that belongs to this place.
Secondly, the reading of this landscape collection materializes in a 'walk', which is the framework that holds all the architectures together. Looking, narrating, and walking are three actions that become a way of re-signifying a landscape. Essentially, the new reading of the landscape consists of 'observing' with new eyes the abandoned water architectures, 'narrating' a discourse that links them to each other and to the river water, and 'walking' along this line of water and time, to discover, in situ, these pieces as an open-air exhibition.
Finally, achieving the successful integration of this heritage into the existing landscape and its proper reuse is fundamental to re-establishing harmony. The architectural traces of how this landscape has been inhabited and how people have tried to domesticate water are already here. It is necessary to intervene sustainably and give them new uses related to nature and human interaction with it, turning the ruins into an active and respectful heritage. The reference cases explained show the potential design ap-

proach of this proposal, grading from projects with prominence on human use to fully natural use by flora and fauna.

The Architectures of Water offer multiple opportunities to reestablish new forms of balance between humans and nature within the Alto Guadiana landscape. Taking care of this existing heritage means protecting this cultural landscape and becomes a practical way of providing a secure space for the resurgence of nature and the recovery of local biodiversity in Alto Guadiana, always permitting human life and enjoyment of this natural landscape. In conclusion, giving a new meaning to the architectural pieces provokes their conversion into literally new spaces for equilibrium – by introducing new uses related to the interaction between humans and nature – and, as a consequence, a resignification of the whole landscape.

Ana Isabel Santolaria Castellanos gratefully acknowledges the financial support of the postdoctoral grant UPC Margarita Salas 2021, by the Spanish Ministry of Universities and the European Union - Next Generation EU.

Note

[1] Translated by the authors.
[2] Fernando Pessoa, *Poemas de Alberto Caeiro*, 1957.
[3] Paisaje (Spanish) is "a piece of country (país) in a painting", Diccionario de Autoridades de Real Academia Española (www.rae.es). More information in Courcelles D. 2020, *Habitar maravillosamente el mundo*, Siruela, Madrid.
[4] Studio Ossidiana. The Bird's Palace, Vondelpark, Amsterdam, <https://www.studio-ossidiana.com/the-birds-palace> (06/24).

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