



Paseo de la Castellana, 12. 28046 Madrid – ES
T + 34 91 435 22 00 (*214)
europan.esp@cscae.com
www.europan-esp.es
@europan_esp
Spanish, French, English
10 a.m. - 2 p.m., Monday to Friday

EUROPAN 17 / LIVING CITIES 2

Competition Brief

Barcelona
Chiva
Eibar
Eivissa/Ibiza
Madrid
Nalón
El Prat de Llobregat
Torrelavega





EUROPAN 17 SPAIN, “LIVING CITIES 2”

The objective of EUROPAN is to bring to the fore Europe’s young architecture and urban design professionals, and to present and develop their ideas.

It is also about helping cities and developers who provided sites to find innovative architectural and urban solutions for the transformation of urban locations and help them to implement. The open competition is an anonymous and public call for ideas on a European scale.

The aim of EUROPAN Spain is to implement the projects chosen by EUROPAN 17 national jury. In order to facilitate contracting of the proposals by public administrations participating in EUROPAN Spain as the core of the Competition, the Ministry of Transports, Mobility and Urban Agenda launches the Competition in Spain, establishing its Rules by a bidding document that complies with the procedure of Juried Design Competitions as provided in section 183 et seq of the LCSP. This ensures compliance with the conditions established in the EUROPAN Internal Procedures and in the aforementioned Law.

Therefore, in case of entering any of the Spanish sites, it is important to get familiar with the “Rules of the EUROPAN 17 Juried Design Competition”, published in the Official Public Tender Platform.

EUROPAN/ESPAÑA NATIONAL COMMITTEE

President: Ministry of Transports, Mobility and Urban Agenda (Ministerio de Transportes, Movilidad y Agenda Urbana)

Members

General Direction of Urban Agenda and Architecture, Ministry of Transports, Mobility and Urban Agenda (Ministerio de Transportes, Movilidad y Agenda Urbana) / Consejo Superior de Colegios de Arquitectos de España (CSCAE)

City of Barcelona / City of Madrid / General Direction of Territorial Planning and Urbanism of the Regional Government of Principado de Asturias / Directorate-General for Urban planning and Land management, Government of Cantabria / General Direction of Housing and Architecture, Regional Government of Balearic Islands / General Direction of Ecological Innovation in Construction, Regional Government of Valencia/ General Direction of Architecture and Housing, Basque Regional Government/ INCASOL
City of Chiva / City of Eibar / City of Ibiza / City of Muros de Nalón / City of El Prat de Llobregat / City of Soto del Barco / City of Torrelavega / /ADIF

NATIONAL SECRETARIAT EUROPAN España

Carmen Imbernón, General Secretary.

Begoña Fernández-Shaw, Vice Secretary in charge of implementations follow-up.

EUROPAN ESPAÑA JURY

Iñaki Carnicero, president EUROPAN España

Iñaki Alday; www.aldayjover.com

Zuhai Kol; <https://openact.eu/>

Lola Domenech; <https://www.loladomenech.com/es/>

Alexandre Thériot; <http://bruther.biz/>

Carolina González Vives <https://hidra.design/sostenibilidad/>

Marina Otero; <https://architect.com/marinaotero>

Anna Viader; <http://www.annaviader.com>

Bernd Vlay; <https://www.vlst.at/en/>

Subtitutes: Lys Villalba <https://lysvillalba.net/> + Maé Durant Vidal. <https://pezestudio.org/>

PRIZES

EUROPAN/España intends to award 8 first prizes and 8 second prizes, in addition to the special mentions. The winner and runner-up teams receive a prize of €12,000 and €6,000 (including tax) respectively.

In Spain, the EUROPAN awards are exempt from tax withholding in accordance with the Resolution of April 5, 2006, of the Department of Tax Management of the State Agency of Tax Administration, granting the exemption provided for in Article 7 (1) Royal Legislative Decree 3/2004, of 5 March.

LEGAL PROVISIONS

For nationals from EU and EES countries in possession of a diploma in accordance with EU Directive 2005/36/EC and wishing to practice on a provision of services basis (occasional), they must be legally established in a Member State for the purpose of pursuing the same profession in Spain. They must ask for an authorization to the competent authority, the Ministry of Transport, Mobility and Urban Agenda (Ministerio de Transportes, Movilidad y Agenda Urbana, Subdirección de Normativa y Estudios Técnicos. Secretaría General Técnica. Paseo de la Castellana, 67 – 28071 Madrid).

For nationals in possession of a diploma from other countries, please contact the Ministry of Education.

SITE PARTICULARITIES REGARDING THE ORGANISATION OF THE COMPETITION

Site Representative

Ms Sonia Puente Landázuri, Director General for Planning and Urban Development, Department of Rural Affairs and Territorial Cohesion, Government of the Principality of Asturias.

Actors involved

- Department of Rural Affairs and Territorial Cohesion of the Principality of Asturias
- City Council of Muros de Nalón
- City Council of Soto del Barco
- Economic Development Institute of the Principality of Asturias (IDEPA).

Profile of the team representative:

Architect

Expected skills regarding the site's issues and characteristics:

- Urban design and resilient landscaping.
- Nature-based solutions applied to public space.
- River and marine dynamics.
- Adaptation to climate change.
- Biology of coastal ecosystems.

Communication and Publicity

The Launching of the competition and the Results of EUROPAN 17/Spain will be published in the State Contracting Platform (<https://contrataciondelestado.es>), the B.O.E (Official State Gazette) as well as in a national newspaper.

The results of EUROPAN /SPAIN will be published in a catalogue. All the EUROPAN 17 projects awarded and specially mentioned by the Jury will be displayed in a travelling exhibition.

The teams rewarded in EUROPAN Spain will be invited to present their work in forums and workshops, both at national and international level.

Jury – 1st evaluation

In the first jury meeting, the site representatives participate with voice and vote.

Post-Competition Procedure

Soon after the results announcement, winning teams in the Spanish sites will be invited to a meeting with the site Representatives in order to present their proposals. This presentation will be followed by round tables in which jury members are invited.

Provided procedure for the contract following the Juried Design Competition.

EUROPAN Competition is in compliance with the EU directive for procurement Directive 2014/24/EU and with Spanish National Law.

Public Administrations that take part in the competition as members of the National Committee, or any other entity in which they may delegate (Local Entities, Autonomous Communities or, where appropriate, Public Law Entities) are recognised as contracting authorities, to proceed in each of the sites to award the service contract by means of a negotiated procedure, without prior publication, to the winner of the design contest. In case of ex-aequo prizes, all winning teams shall be invited to participate in the negotiations.

Commission after Competition:

- A. Project for the renaturalisation of the dyke and esplanade of Puerto Chico and project management.
- B. Project for the environmental recovery of the Xunquera and La Llama beach, and project management.
- C. Drafting of an urban development plan for the surroundings of the shipyard and the L'Arena dock.

International Competition EUROPAN 17

Estuario del Nalón (ES)

Revitalising a port infrastructure

Brief

Index

1. Purpose of this document	7
2. General framework	8
3. Questions posed to the participating teams.....	9
3.1. An opportunity in relation to the theme of the current EUROPAN edition	9
3.2. Approach to be taken	9
3.3. Design's general criteria	11
4. Territorial area	12
5. Reflection site	
5.1. Historic evolution.....	15
5.2. Ports and their functional areas	15
5.3. Possible uses	17
5.4. Foreseeable impacts of climate change	18
6. Project sites.....	19
A. The dyke and the esplanade of Puerto Chico	21
B. La Xunquera and La Llama beach	23
C. The shipyard of La Xunquera and the dock of L'Arena	24
7. Sources and bibliography	30

List of illustrations

Figure 1. Presentation of the site at the Clermont-Ferrand Intersessional Forum, 4/11/2022....	7
Figure 2. Meeting of local agents in Muros de Nalón, 1/3/2023.	8
Figure 3. Delimitation of the territorial area. Source: IGN, own elaboration.	13
Figure 4. The territorial area, in the context of the Central Metropolitan Area of Asturias. Source: IGN, own elaboration.	13
Figure 5. Evolution of the resident population 2001-2022 (SADEI).	14
Figure 6. Population pyramids of Muros de Nalón and Soto del Barco. Source: SADEI.	14
Figure 7. Distribution of employment by economic sector, 2020. Source: SADEI.	14
Figure 8. The Pravia estuary in 1797, according to the plan drawn up by José Müller	15
Figure 9. Port of San Esteban in 1975.	17
Figure 10. Maximum flooding of the extreme event of 500 years return period with a rise in Average Sea Level corresponding to the RCP8.5 regionalised in the Principality of Asturias at the end of the century (year 2100). Source: Instituto de Hidráulica Ambiental de Cantabria, Estudio de adaptación al cambio climático de la costa asturiana.	19
Figure 11. The entrance channel to the port in 1981.	21
Figure 12. Old west dyke, section. Source: Servicio de Puertos del Principado de Asturias.	21
Figure 13. New dyke, section. Source: Servicio de Puertos del Principado de Asturias.	22
Figure 14. Salicornia dolichostachya community. Photograph: Ignacio Fernández Villar.	23
Figure 15. Dock used for the scrapping of boats, now in disuse.	23
Figure 16. Jetties on the banks of the Nalón. Photography: Ramon Noriega.....	24
Figure 17. The rail yard and the San Esteban dock on 24 August 1956. Source: CNIG, American photogrammetric flight series B.....	25
Figure 19. The San Esteban dock and shipyard, on October 14, 1981. Source: SITPA-IDEAS, photogrammetric flight 1981-1982.....	26
Figure 18. Subarea C on the river's left bank.	26
Figure 20. Drafts corresponding to low or exceptional probability flood (T=500 years), in metres. Source: Cantabrian Hydrographic Confederation, own elaboration..	27
Figure 21. The Club Náutico Puerto Norte building and the Interpretation Centre "Puerta del Mar".	29
Figure 22. El muelle de L'Arena y la fachada urbana conexa.....	29

1. Purpose of this document

This document aims to provide the teams participating in the seventeenth edition of the EUROSPAN international competition for architectural and urban planning ideas with all the relevant information about the site proposed by the Principality of Asturias, as the promoting member, the Nalón estuary, and to establish the questions to be answered, the approach to be adopted, the problems to be addressed and the technical conditions to be observed by the proposals. This is the result of a process of shared thought, initiated in June 2022, promoted by the General Directorate of Territorial and Urban Development of the Principality of Asturias. The General Directorates of Road and Port Infrastructures, Natural Environment and Rural Planning, and Maritime Fisheries, as holders of various competences in the study area, and the city councils of Muros de Nalón and Soto del Barco, whose municipalities are concerned by the intervention, are collaborating with their contributions and observations.

This document also takes into account the contributions of EUROSPAN Spain's National Committee, its National Secretariat, the European Scientific Committee, the experience of the previous edition shared by the national committees at the Intersessional Forum held in Clermont-Ferrand between 2 and 5 November 2022, as well as the understanding of the place, the needs and visions of the community expressed at the Meeting of local agents held at the Casa de la Cultura in Muros de Nalón on 1 March 2023 ([see program](#)). Expert advice was provided by the [Applied Fluvial and Coastal Geomorphology Unit of the Institute of Natural Resources and Territorial Planning \(INDUROT\) of the University of Oviedo](#).



Figure 1. Presentation of the site at the Clermont-Ferrand Intersessions Forum, 4/11/2022.



Figure 2. Meeting of local agents in Muros de Nalón, 1/3/2023.

2. General framework

The Nalón estuary is a complex and unique territorial system, which combines high ecological, landscape and cultural assets. It currently faces the challenge of environmental restoration, economic diversification and employment creation as alternatives to the decline of port and fishing activity.

The port of San Esteban played a very important role linked to coal mining in the Asturian production system until the 1970s. It is part of the collective imaginary and identity of the region. It has a great interest as an industrial heritage site, and is located in a setting of enormous landscape and environmental value.

The decadence of port activity as a result of the decline of mining has freed up a significant area of land and provides an excellent opportunity for the reorganisation of vacant spaces under a new perspective, taking into account the ecological and climatic implications, as well as the incipient development of recreational boating and other sport activities.

The three sites proposed by the Principality of Asturias to EUROPEAN17, in accordance with its theme Living Cities II, *Re-imagining architectures taking care of inhabited environments*, encompass such interrelated natural and cultural dimensions that the whole study area can be understood as one ecotone, that is, a transitional space between rural, urban and natural landscapes:

It stands out for its environmental and ecological values, which is why it is included in the Site of Communal Interest and Area of Special Protection for Birds Cabo Busto-Luanco (ES1200055 and ES0000318) of the Natura 2000 Network.

One hundred years of intense port activity have resulted in a valuable industrial patrimony, a genuine open-air museum that includes a shipyard, docks, loading bays and other infrastructures, as well as riveted steel-framed cranes and railway equipment, conferring uniqueness and its own identity to the ensemble.

Although its role as a modal transport interchanger has diminished significantly, the port itself is an ecotone between marine and terrestrial environments.

Nevertheless, the territorial system presents a series of weaknesses that hinder its progression towards sustainability, among which the following stand out:

Degradation of the natural spaces as a consequence of uncontrolled industrial fillings and spills, invasive species and the environmental impact of port transit and shipbreaking.

Agitation of the water surface, turning navigation difficult, especially in certain wind conditions and at specific times of the year.

Lack of adapted infrastructure to the needs of companies operating in both ports.

The effect of natural fluvial dynamic processes, especially sediment deposition, on activities linked to the marine environment.

On the other hand, the lower course of the river Nalón presents a high level of flood risk, which will increase due to the foreseeable impacts of climate change.

It should also be taken into account that the area is located on the western boundary of the Central Metropolitan Area of Asturias, a multi-polar urban conurbation of 850,000 inhabitants and 85% of the regional GDP. It is therefore destined to become a key element in the metropolitan system of free spaces.

All the land is publicly owned and all the public actors concerned are involved in the proposal: at the regional level, the departments of Infrastructures, Fishing, Biodiversity and Territorial Planning; and at the local level, the town councils of Muros de Nalón and Soto del Barco.

3. Questions posed to the participating teams

3.1. An opportunity in relation to the theme of the current EUROPAN edition

Through approaches based on the consideration of natural processes, large unused or degraded areas can be transformed to provide strategic environmental services: increasing the hydraulic capacity of the estuary to reduce the risk of flooding, closing the water cycle, increasing the surface of valuable ecosystems such as marshlands, and promoting scientific research or environmental education, among many others. Different strategies could be tested here to introduce nature into the infrastructure of the port, renaturalise the river banks, "give space to the river", always without discredit to its value as a unique industrial patrimony.

Nonetheless, EUROPAN 17 requires caring not only for predominantly natural areas, but also for the anthropised ones. The participating teams have to provide ideas, with an innovative perspective, on how to promote the transition from coal-focused port activity to diversification, including activities linked to sport fishing, recreational boating, sustainable and deseasonalised tourism, especially fishing or ornithological tourism, taking advantage of the opportunities of the new Blue Economy. A variety of emerging business initiatives, now precariously hosted, need decent locations to offer their services; also, small industries around the former shipyard need to be reorganised and dignified. The answers will undoubtedly have to be technically and economically viable, and take into consideration environmental and landscape values, as well as the foreseeable rise of the average sea level and the risks of flooding associated with increasingly intense and frequent meteorological phenomena.

3.2. Approach to be taken

The port infrastructure of the Nalón Estuary was designed and dimensioned at the beginning of the 20th century as the main loading and transport point for all coal production from the

Asturian mines to the steel plants in the Basque Country; it is hence part of the collective imaginary and identity of the region.

The decline of mining led to the gradual abandonment of its activity, which is why it is necessary to reinvent the port area to welcome new activities in order to

renaturalise and contribute to adaptation to climate change throughout the estuary,

preserve and enhance the valuable local industrial patrimony, and

boost the production of ecosystemic services for provisioning, regulating and for culture, including the physical and psychological wellbeing of the population and the landscape and environmental quality of the inhabited environment.

In their proposals, the participating teams should consider the following general objectives:

Adaptation to climate change. The estuary is exposed to a significant risk of marine and river flooding. According to available climate projections for the region, the average sea level will rise significantly and extreme weather events will become more intense and frequent, thus increasing the present risk. The major floods of the Nalón are becoming more frequent and the intensity of the waves in the Cantabrian Sea is increasing, transformations due to fluvial dynamics will therefore intensify. Other processes of anthropic origin, such as the construction of dams, dykes, channelling, etc., or changes in land use that affect its natural runoff are altering the sediment inputs to the estuary.

Enhancement of ecosystems. After decades of industrial activity mainly focused on coal port traffic, several restoration projects have significantly improved the environmental conditions of the estuary. However, much remains to be done to regenerate the diverse and valuable ecosystems, including beaches, marshlands and mudflats.

Coexistence between economic and environmental transitions. The environmental and landscape quality is an attraction for new recreational activities typical of coastal areas; the availableness of a widespread and partly permanent sheet of water is one of the strengths of this system. The challenge for the estuary is therefore to reconcile the protection of biodiversity, the production of ecosystemic services and economic diversification.

Boosting circular economy. All proposed actions will seek to reduce their carbon footprint by considering the life cycle of materials and reducing the volume of unusable waste to a minimum.

Under these terms, the questions posed to the competing teams are the following:

How to revitalise a port infrastructure and turn it into a provider of ecosystemic services for a population of more than 800,000 inhabitants?

What strategies can be designed to reconcile the conservation of the natural, cultural and landscape heritage with reactivating economy reactivation and employment generation in the estuary?

It is expected from the competing teams a general proposal for the planning of the whole study area, and detailed proposals for any of the three project areas, and without limitation on the number. Each of them has its own character and programme of needs, which are described in section 6.

3.3. Design's general criteria

The proposals will answer to the following design criteria:

In the whole area:

Integrate natural processes as contributors to tackle climatic impacts, by replacing complex solutions in terms of materials, construction techniques, construction work, energy consumption or maintenance, with others based on natural dynamics.

Reorganise existing activities to achieve greater efficiency in the use of a scarce resource such as the estuary soil, which supports valuable ecosystemic services.

Renaturalise areas degraded by productive activities and abandoned infrastructures, uncontrolled discharges, etc., to provide the river with natural space and thus contribute to a favourable state of conservation for the habitats and species of interest associated with the estuarine ecosystem.

Promote the natural conditions and processes that allow the development of the biotic communities characteristic of these ecosystems.

Prevent the presence of invasive alien species and promote habitat biodiversity.

Make environmental regeneration compatible with the development of services linked to the enjoyment of the natural environment, in particular through the reorganisation of parking space and the facilitation of sustainable mobility modes.

Rationalise implementation costs and maximise the efficiency of investments in relation to their environmental and social benefits.

In urban-dominant areas:

Understanding public space as a producer of ecosystemic services of provision, regulation (including climate regulation) and socio-cultural services, as being part of a system of green infrastructures and ecological corridors connecting the urban fabric with the rural environment. Supporting the sustainable completion of the water cycle by increasing ground permeability, as well as implementing sustainable urban drainage systems that reduce the ecological footprint of sewage services, reduce flood risk, increase biodiversity, improve soil quality and depth, and contribute to the regulation of ambient temperature.

Increasing urban biomass and greening streets and recreational areas

By using a diversity of plant species adapted to present and future local climate, resistant to the adverse conditions of the urban environment, requiring reasonable watering and maintenance costs, and favouring pollination,

By keeping the existing bush stratum and the existing trees,

By supporting the control of exotic and invasive flora,

By avoiding the need to use phytosanitary treatments with environmental or health impacts,

By taking into account growth, seasonal changes, shade volume, flowering and colour variables, and

By applying solutions and techniques linked to a new aesthetic code within the general approach of a more resilient landscaping.

Reduce the heat island effect and improve thermal comfort by providing shaded areas, vegetation and pavements with a high solar refractance index.

Contribute to climate change mitigation and carbon neutrality through the provision of renewable energy systems.

Consider the life span of the materials to be used, minimising the emissions generated and the resources consumed in their production, as well as their environmental and human health impacts,

using those with low embodied energy and that are recyclable at the end of their life cycle, using aggregates and other construction materials with a high percentage of recycled material, and avoiding the use of materials containing heavy metals and volatile organic compounds.

Evaluate the materials resulting from demolition not as waste, but as resources that can be reused in the works in order to reduce the impacts associated with their transport and dumping, and thus contribute to the completion of their life cycle.

Take into account the United Nations Convention on the Rights of Persons with Disabilities, as well as the criteria of universal accessibility and universal design, or design for all people, as defined in the revised text of the General Law on the Rights of Persons with Disabilities and their Social Inclusion, approved by Royal Legislative Decree 1/2013, of 29 November.

Configure inclusive public spaces, sensitive to diversity and the needs of vulnerable people, adopting a gender perspective. Use inclusive urban furniture favourable to social interaction and responding to the needs of all profiles and groups.

Provide adequate parking space that meets the needs of the residents and sustainable mobility modes.

Ensure access to motorised vehicles for maintenance, emergency, cleaning, lighting, taxis and loading and unloading services.

Ensure that pedestrians, cyclists and personal mobility vehicle users have priority over any type of motorised vehicle in recreational spaces, guaranteeing their speed moderation.

Monitor potential adverse effects on, or contrary to the sustainability of the urban system or climate change mitigation (*maladaptation*).

Configure flexible spaces that can accommodate diverse occasional uses and ease the relation between the public space and the buildings' ground floors.

4. Territorial area

The sites are located in a well-defined landscape unit with singular characteristics that is the Ría de San Esteban or Nalón, the longest most abundant river in the Asturian fluvial system, an area that covers a surface of approximately 37.4 km².

This unit is defined and delimited in the Atlas of the Landscapes of Spain, which includes it in the landscape type called *Cantabrian-Atlantic estuaries and bays, association of Cantabrian-Atlantic estuaries, seascapes and shallows*. It has a total population of 6,243 inhabitants (Figure 3). One of the best views of this territory can be enjoyed from the [Monteagudo viewpoint](#).

The location of the territorial area on the western edge of the Central Metropolitan Area of Asturias decisively conditions its demographic dynamics and economic performance as it is a multipolar urban agglomeration that concentrates 85% of the population and regional gross added value. In terms of population, both Muros de Nalón and Soto del Barco showed between 2011 and 2022 a slight annual decrease in relation to that of the region as a whole, with a slight upturn in recent years. Since 2010, a relative rejuvenation has been observed in Muros de Nalón, whose ageing rate has fallen by 18% to match that of Soto del Barco, though still appreciably above the regional rate. With a clearly negative natural increase, it is the migratory movements to both municipalities that are responsible for the recent slight demographic increase.



Figure 3. Delimitation of the territorial area. Source: IGN, own elaboration.



Figure 4. The territorial area, in the context of the Central Metropolitan Area of Asturias. Source: IGN, own elaboration.

Since 2010, the growth of gross added value in both Muros de Nalón and Soto del Barco has exceeded that of the whole of Asturias, standing at 20.644 and 37.546 million euros, respectively. The local economy has a strong tertiary sector, with employment concentrated in the services, hostelry and catering and commercial sectors (see data [here](#)).

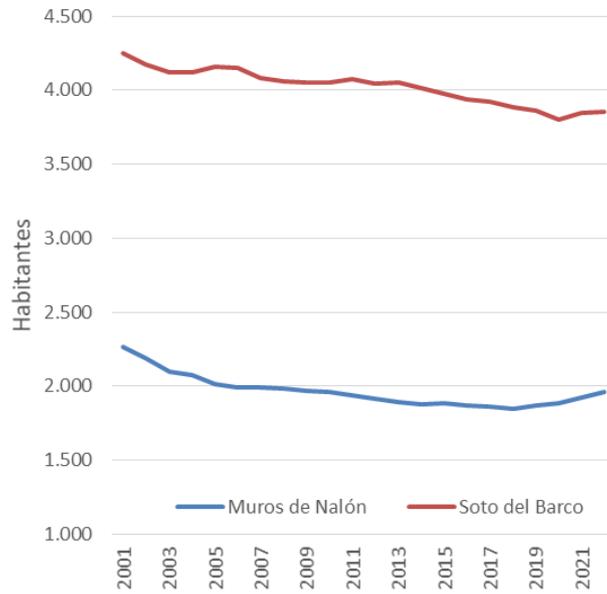


Figure 5. Evolution of the resident population 2001-2022 (SADEI).

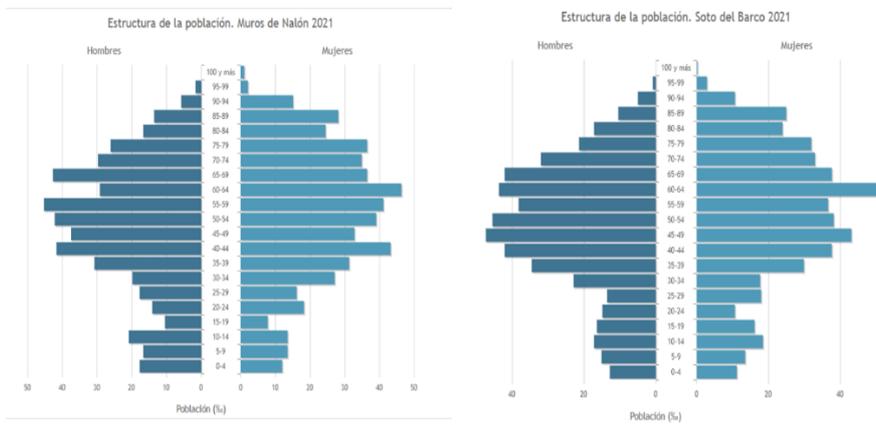


Figure 6. Population pyramids of Muros de Nalón and Soto del Barco. Source: SADEI.

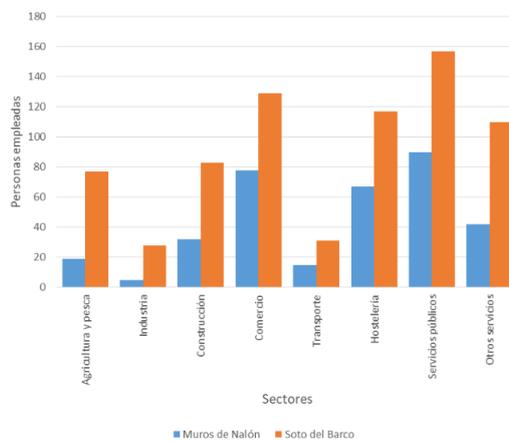


Figure 7. Distribution of employment by economic sector, 2020. Source: SADEI.

5. Reflection site

The urban scale covers the area included in the maritime-terrestrial public domain assigned to the regional ports of San Esteban de Pravia, in the municipality of Muros de Nalón, and L'Arena, in the municipality of Soto del Barco, as well as adjacent land in the area known as La Xunquera, owned by the Municipality of Muros de Nalón and the Institute for Economic Development of the Principality of Asturias (IDEPA). It has an area of 150.73 Ha and a perimeter of 9.35 km. It is home to a population of 1,845 people, distributed in the following centres (SADEI, 2021):

Urban centre	Population 2021
San Esteban	476
L'Arena	1.369
Total	1.845

5.1. Historic evolution

A project was designed at the end of the 18th century to channel the river Nalón in order to unload the coal production of the Asturian basins through the river port of San Esteban de Pravia. A small dock was used for the loading of mineral and other products, but the river floodings and the elevated costs led to the abandonment of the project¹.

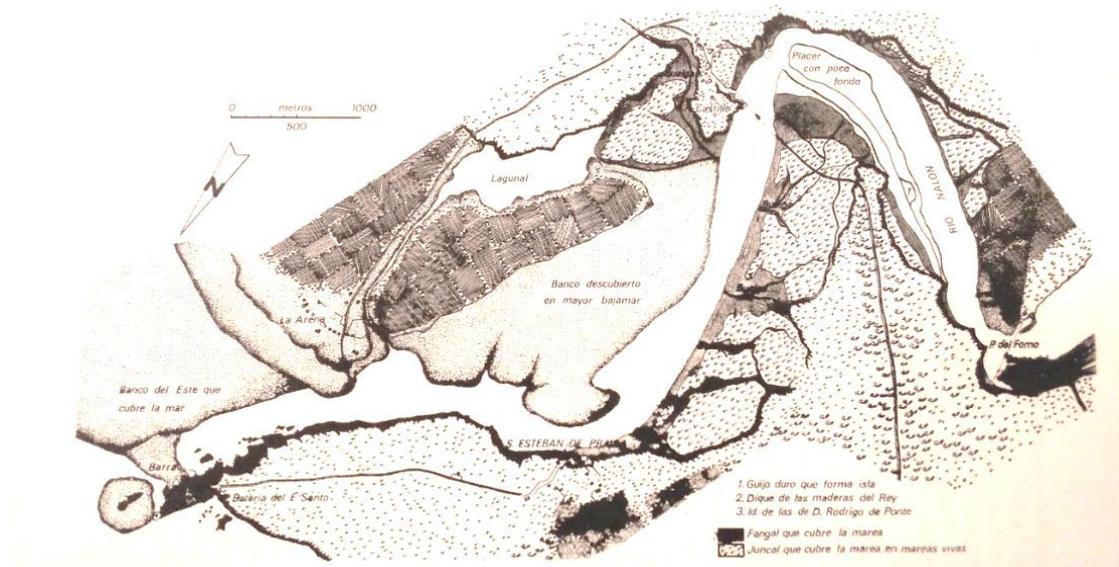


Figure 8. The Pravia estuary in 1797, according to the plan drawn up by José Müller²

¹ Fernández Gutiérrez, María Fernanda, y Bas Ordóñez, Guillermo. 2014. "San Esteban de Pravia, puerto carbonero. Una valoración patrimonial industrial actualizada", in Álvarez Areces, Miguel Ángel (ed. and coord.), *Patrimonio marítimo, fluvial y pesquero*, XV Jornadas Internacionales de Patrimonio Industrial, Asociación de Arqueología Industrial INCUNA, Gijón, pages 497-505.

² Quirós Linares, Francisco. 1975. *El puerto de San Esteban de Pravia*, Departamento de Geografía de la Universidad de Oviedo, Instituto J.S. Elcano, Oviedo, page 84.

It was not until the early years of the 20th century that the communication difficulties with the central area of Asturias - the most industrialised and populated area of the region - were overcome, allowing the conditions for the old port of San Esteban to develop until it became one of the busiest on the Cantabrian coast. In the 1890s, the entry of Basque capital into coal mining in the Caudal basin and, more specifically, in the mines in the Turón valley, pointed at the constraints for transporting the mineral to the industries based in Bilbao. The General Basque-Asturian Railway Company (Sociedad General de Ferrocarriles Vasco-Asturiana) was created in 1899 to solve this deficit, and a narrow-gauge railway was planned between the mining sites and the port of San Esteban, following the course of the rivers Caudal and Nalón, including a branch line to Oviedo. The first section of the new line, Oviedo-Fuso de la Reina-San Esteban, was inaugurated on 2 August 1904. This event determined the progressive transformation of the port into its current morphology. The terminus station was located at the entrance to the town. Part of the marshland was covered up in order to receive the service installations and the track platform where the mineral was sorted and -because of San Esteban's status as a tidal port-, transported in smaller convoys to the three loading docks located downstream -of which only two remain today-, by means of a ramp that ran through town. The quays of the dock were fitted out for general freight traffic and were equipped in 1929-1930 with riveted steel structure overhead cranes, three of which are still in place.

The gradual increase in coal traffic during the First World War triggered new interventions, such as the enlargement of the bar, the acquisition of new electric cranes, the construction of a power transformer and several administrative and service buildings, as well as the removal of a hillside for the installation of sixteen reinforced concrete hoppers inaugurated in 1936, that were fed by a wagon tipper and several conveyor belts.³

At the end of the sixties of the last century, the gradual decline of the port began, caused by the decreasing flow of coal transported by the Basque-Asturian railway - which went on to feed the recently built thermal power station at Soto de Ribera -, the crisis in the mining and siderurgical sector, the accumulation of sediments, and the arrival on the market of foreign coal through the port of El Musel in Gijón⁴. The hard coal transport disappears completely, the loading facilities are scrapped, and at the end of the 1980s, the track yard with its workshops and locomotive and water depots is definitively dismantled. In 1982, with no commercial activity, San Esteban de Pravia lost its status as a port of general State interest, and its ownership and facilities were transferred to the Principality of Asturias; it now forms part of the Regional Port Network.⁵

³ Fernández Gutiérrez, María Fernanda et al. 2010. *Memoria del Catálogo Urbanístico de Muros de Nalón*.

⁴ Fernández Gutiérrez, M. F. (2010).

⁵ Royal Decree 3082/1982, of 24 July 1982, on the transfer of duties and services of the General State Administration to the Principality of Asturias in port matters (BOE 22 November)..

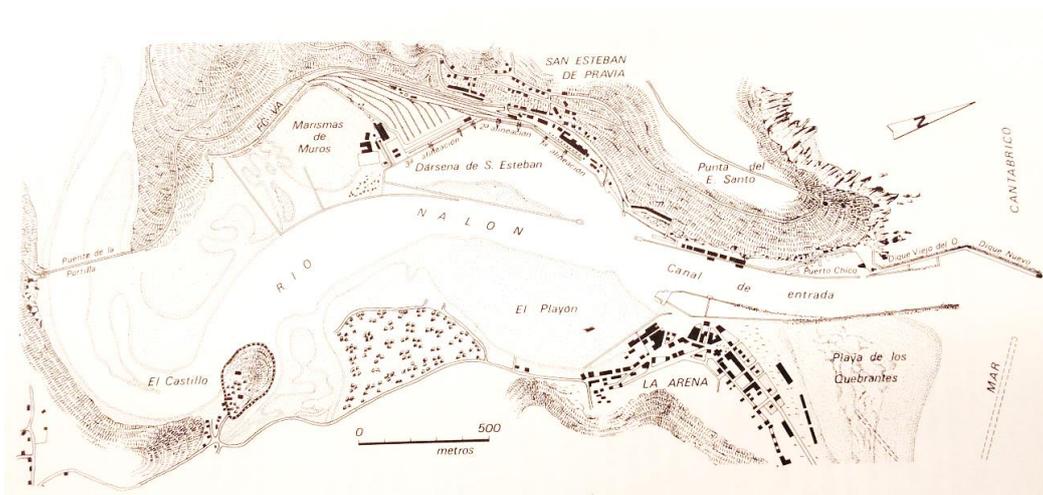


Figure 9. Port of San Esteban in 1975⁶.

5.2. Ports and their functional areas

The surfaces of land and water required for the development of port activities constitute the so-called service area of the ports. In the cases of San Esteban de Pravia and L'Arena, all the terrain included in the service area has a maritime-terrestrial public domain status, assigned or transferred by the General State Administration to the Principality of Asturias, forming part of the Regional Network of Ports.

Uses and activities in the service area are carried out in accordance with a prior authorisation or concession. Port infrastructures are also located in this area (breakwater dykes and other installations related to navigation and strictly port activities, fixed or mobile, necessary to the operation, maintenance and safety of port activities, such as launching ramps, jetties, berths, docks, beacons or piers, etc.).

In order to ensure the port area's operability, proposals will take into consideration the following zonal typology:

Port infrastructure zone: generally speaking, this comprises a 10-metre wide strip measured from the edge of the berthing docks, channel walls or breakwater embankments. It includes areas destined for breakwater dykes and other installations related to navigation and strictly port activities, fixed or mobile, necessary to the operation, maintenance and safety of port activities such as launching ramps, jetties, berths, docks, or piers, etc. This area will be statued as port service area and only strictly port infrastructures and uses will be supported.

Fishing/nautical-sports port zone: areas destined for activities and uses related to professional fishing and recreational boating.

Complementary port zone: It comprises the spaces destined for activities related to navigation that need to be located in the port area.

Service area: locations where uses specific to urban life are developed, or where services are provided to citizens, whether or not they are related to port activity.

⁶ Quirós Linares, F. (1975).

- Reserve zone: free areas without specific zoning that may be subject to future development.
- Protection zone: areas free of buildings that should be subject to protection in consideration of their environmental or cultural value.
- Maritime zone: areas for navigation and ship berthing carried on the sheet of water.

The communication between the two port areas occurs along the national road 632. In season, a boat service between San Esteban and L'Arena is also provided. It is planned to reinforce these connections by means of a coastal path that will form part of the Cantabrian coastal itinerary within the framework of the network of Natural Paths of Spain.

5.3. Possible uses

Proposals will allow for at least the following uses:

Fishing use. This use groups together the spaces, buildings and annexed installations linked to fishing activity in general, such as available spaces for services accessory to fishing, where nets, provisions, supplies and gear can be gathered and stocked, people and goods can be embarked and disembarked; fishermen's warehouses; workshops; centres for experimentation or for fishing products processing; fish markets and storage.

Nautical sports use. These are the uses and facilities related to sport navigation, such as the mooring of boats, provisioning, embarkation and disembarkation of people and goods, toilets and showers linked to this activity, as well as sailing schools and nautical clubs.

Industrial use. Installations for the construction and repair of ships or any other activity linked to the port and, in general, to the Blue Economy.

Dry dock use. Spaces destined for dry docking areas free of buildings, with the sole exception of small auxiliary constructions.

Land berthing use. Space on the sheet of water of linear shape adjacent to the port area, where are only allowed activities related to the stay of ships and operations of provisioning, waste management, and embarkation-disembarkation of people and goods.

Port infrastructure use. This includes breakwaters and other facilities related to navigation and strictly port activities, fixed or mobile, necessary for the operation, maintenance and safety of port activities such as launching ramps, jetties, berths, docks, beacons or piers, and which are not expressly included in other port uses. Lighthouses and annexed installations are included on a singular basis.

Port use. This includes facilities of a port related nature or linked to that use that are not included in any of the above, among which administration office buildings; maintenance facilities and meteorological or rescue facilities; auxiliary activities and assistance to ships and machinery such as logistical and storage activities, including lifting and lowering cranes; or fuel supply stations for ships.

Railway infrastructure use. Spaces destined for railway services and the facilities affected by them.

Use for public services. This includes uses that provide citizens with the services of urban life, guaranteeing the social and health services that allow for their integral development and wellbeing, as well as recreation and leisure for the population. On a singular basis, it includes buildings for public or private use, parks, gardens, children's play areas, open-air sports activities, or urban spaces where collective events, festivities and celebrations can be held.

Hostelry use. Facilities for bars, cafeterias and restaurants.

Residential use. This use corresponds to buildings or parts of buildings intended to provide permanent accommodation for people, linked to R&D&I activities within the frame of the new Green and Blue economies.

Protected areas use. Spaces free of buildings which should be subject to environmental protection by virtue of their characteristics. This specifically includes cliffs, mountain slopes, marshes and similar areas.

Reserve use. It is possible to delimit open spaces that without a specific current use can be the object of future development.

Berthing use. A space on the sheet of water where only activities related to the stay of ships and supply operations, waste management, and the embarkation-disembarkation of people and goods are permitted. It will be resolved by means of floating or piloted light port infrastructures (pontoons), minimising the use of the maritime-terrestrial public domain and the impact on the landscape.

Anchoring use. Area designated for this practice that consists of mooring boats to the seabed.

Navigation use. Space on the sheet of water where the circulation of boats is authorised.

5.4. Foreseeable impacts of climate change

Of all the units that compose the Asturian territorial system, without doubt the coast presents the greatest global level of exposure to the impacts of climate change. The rise in the average sea level and its effect on extreme meteorological phenomena's impacts, the increase in sea surface temperature, acidification or changes in waves and meteorological tides are contributing to a considerable increase in coastal risks and will contribute even more in the medium and long term. In the most adverse greenhouse gas emissions scenario, the projected average sea level rise along the Asturian coast at the end of the present century is estimated at 0.65 m.

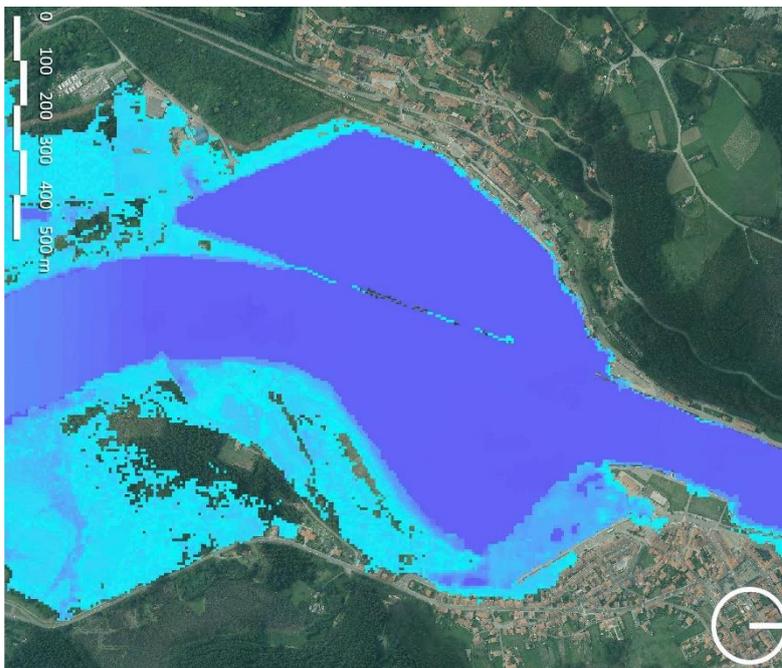


Figure 10. Maximum flooding of extreme event of 500 years return period with a rise in Average Sea Level corresponding to the RCP8.5 regionalised in the Principality of Asturias at

With specific regard to the ports of San Esteban and L'Arena, the Climate Change Adaptation Plan for the Ports of the Principality of Asturias which is about to be approved, identifies the following as the main factors of increased risk due to the effects of climate change:

San Esteban

Increased damage to facilities and equipment due to coastal flooding, and longer downtime for operations, caused by unavailability of minimum freeboard due to the projected sea level rise.

Increased damage to the dyke as a result of reduced stability, due to the projected rise in stress.

Increased damage to facilities and equipment due to the projected rise in wind gusts.

Increased damage to the drainage system and longer downtime of operations due to the projected rise in extreme precipitation.

Increased downtime of operations and maintenance cost of facilities and equipment due to the projected rise in waves' overwash.

Increased pavement maintenance costs and energy demand due to the projected temperature rise.

L'Arena

Increased damage to facilities and equipment due to coastal flooding, and longer downtime for operations caused by unavailability of minimum freeboard due to the projected sea level rise.

Increased damage to the drainage system and longer downtime of operations due to the projected rise in extreme precipitation.

Increased downtime of operations due to the projected rise in wind gusts.

El incremento del tiempo de parada de operaciones, Increased downtime of operations, pavement maintenance costs and energy demand due to the projected temperature rise.

Longer downtime of operations due to the projected increase of sea choppiness.

The marshlands, on the other hand, have a natural capacity to adapt to certain degrees of sea level rise, thanks to vertical accretion processes that raise their relative topographic height and at the same time favours the protection of the coast, which is a strategic environmental service. However, this capacity could be exceeded by a quick rise in sea level, forcing these systems to move inland - if there are no barriers to prevent it - or even resulting in their disappearance when obstacles prevent their retreat. The resilience of coastal marshlands is therefore closely linked to the availability of inland space, which in turn is mainly related to non-climatic factors, such as urbanisation and the construction of infrastructure in the surrounding area.

6. Project sites

A. The dyke and the esplanade of Puerto Chico

It corresponds to the northern end of the port of San Esteban, and is composed of the dyke that protects the entrance to the estuary and prevents the accumulation of sediment on the bar, forming the entrance channel over a length of approximately 650 m, and an infill over the so-called Puerto Chico, which currently houses a seawater swimming pool, sports fields and a parking area, occupying an area of approximately 4.6 Ha.



Figure 11. The entrance channel to the port in 1981.

The dyke operates by gravity, and is protected by a concrete block breakwater along its entire length, with a broken layout in two distinct sections:

The old west dyke, initially made of hydraulic masonry topped with straight ashlar, to which an esplanade was later attached on a fill of scree delimited by a wall of prefabricated concrete blocks, with an approximate width of 31.50m.

1. The new dyke, made of mass concrete (Figure 13). It is currently showing some damage and will require a reloading of blocks in the medium term.

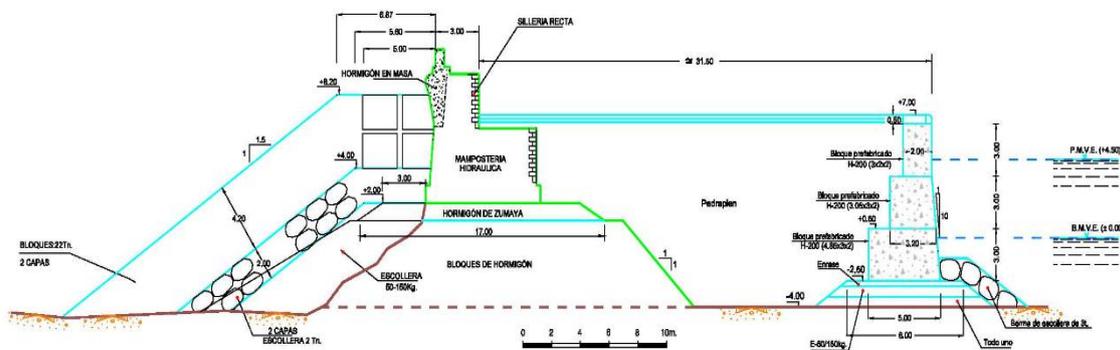


Figure 12. Old west dyke, section. Source: Servicio de Puertos del Principado de Asturias.

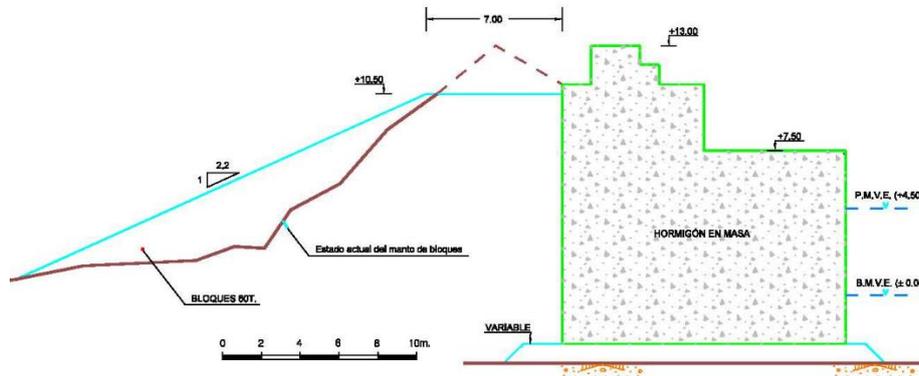


Figure 13. New dyke, section. Source: Servicio de Puertos del Principado de Asturias.

The competing teams are invited to come up with innovative proposals for the dyke, beyond the current port infrastructure use, exploring its potential to contribute to the climate action strategy of the Principality of Asturias through renewable energy generation or renaturation, the reduction of water turmoil in the navigation channel by facilitating its capacity to absorb wave energy, as well as to accommodate public uses. All must be accomplished without compromising its stability as its function is to guarantee navigability in the access to the port.

If a strategic vision is adopted and the metropolitan scale is taken into account, the current state of the infill over the former Puerto Chico highlights the lack of an integrated approach to an open space of great potential. Proposals are expected to rationalise road and parking uses, addressing needs through resilient designs and building systems and having regard to access via public transport and non-motorised vehicles. As in the case of the dyke, proposals related to climate action can be put forward in this area, both in terms of mitigation and adaptation. In any case, it would be desirable to foresee hostelry operations and open-air recreational uses, considering the existing saltwater pool as a unique asset.

B. La Xunquera and La Llama beach

This project area consists mainly of two different habitats of high environmental value. On the one hand, the salt marshes on both banks, which originally extended along the entire estuary and have survived the filling and channelling operations of the river. These are highly unique coastal ecosystems, located in the upper part of the intertidal zone between the mainland and brackish waters, regularly inundated by tidal flooding, dominated by halophytic or salt-tolerant plant communities. These highly biodiverse habitats have often been subject to transformations incompatible with their environmental qualities, as their vegetation plays a very important role in sediment fixation, as well as in the food chain, nutrient inputs to coastal waters, carbon storage and other important environmental services. In the case of the Nalón estuary, it is also worth highlighting its function as a refuge for migratory birds, and the presence of a lagoon on the left bank. There are also areas of sclerophyllous vegetation, reed beds, and willow and alder woods on anthropic fillings. On the other hand are the muddy plains, which support the habitat of community interest 1310 *Pioneer annual vegetation with Salicornia and other species of muddy or sandy areas*, as well as the dunes of La Llama beach.

*Figure 14. Salicornia
dolichostachya community.
Photograph: Ignacio
Fernández Villar*



The main negative impacts on this environment include landfills, spills, power lines, artificialisation and the permanence of wrecks or ship debris on the shores.

The approach to be adopted by the proposals must give priority to the restoration and recovery of habitats, based on a characterisation of existing plant communities, and acting on disused port infrastructures. Marshlands are very sensitive ecosystems, used as safe resting places by birds after traveling thousands of kilometres; if their rest is not respected, the resulting stress can lead to their death. Therefore, the recreational use of these spaces must be reduced to their perimeter, avoiding transversal routes and maintaining respectful distances. Discretion, simplicity and minimum impact must be the criteria for the design of infrastructures associated to this use. Constructions such as observation booths will be avoided, and traditional information panels will be replaced by discrete elements such as QR code signs that allow access to environmental information through mobile devices. The proposal will favor the promotion of responsible ornithological tourism, with expert guidance, environmental education and scientific dissemination, thus promoting employment and the revitalization of the local economy.



*Figure 15. Dock used
for the scrapping of
boats, now in disuse*

On the right bank, La Llama beach is enjoyed by the L'Arena neighbours as an alternative to Los Quebrantos under windy or foggy conditions; access both on foot and by car currently occurs in a disorderly manner, which has negative impacts on the ecosystem. The proposal must also ensure the landscape integration of the current sports facilities and their eventual support buildings in the environment.

Traditionally, fishing activities have been carried out on this bank through small jetties made up of walkways on wooden poles. These are part of the local identity and memory. The participating teams are invited to propose design criteria and prototypes to adapt this activity to the current requirements of safety, rationality and landscape integration.



Figure 16. Jetties on the banks of the Nalón. Photography: Ramon Noriega.

C. The shipyard of La Xunquera and the dock of L'Arena

This project area consists of two zones on each bank of the river, whose common link is their suitability to host new productive activities related to port activity and all those directly or indirectly related to the Green and Blue Economies in general.

On the left bank, the subarea extends along the quay's third alignment, the group of buildings around the old shipyard, the football pitch, a recycling point for the transfer of waste owned by COGERSA, and the landfill by the rail yard used for the transfer and loading of coal, as well as the river channelling wall that forms the San Esteban dock (FigureFigure) It has a direct road access from the second order local network MU-1 road Muros de Nalón-San Esteban, with a level crossing over the metric gauge RENFE track.



Figure 17. The rail yard and the San Esteban dock on 24 August 1956. Source: CNIG, American photogrammetric flight series B.



Figure 19. The San Esteban dock and shipyard, on October 14, 1981. Source: SITPA-IDEAS, photogrammetric flight 1981-1982.



Figure 18. Subarea C on the river's left bank.

All these are uses and facilities located on landfills over the old marshes, with a haphazard layout that does not respond to any prior planning, beyond the logic of implementation of each activity and production process. The result is a very heterogeneous set of buildings in terms of typology, materials, building system and activity, supported by an incomplete and precarious urbanization. Canoeing and other types of active tourism encounter too many obstacles (inadequate rails, paving, ramps and stairs) to access the sheet of water, and difficulties in navigating with a northeasterly wind. The journey along the dividing wall to the red lighthouse is an immersive experience in the estuary landscape.

The lands under the port's old railyard, currently owned by IDEPA, deserve separate consideration. The vegetation present in it has been developing spontaneously, creating some habitats of interest. On the other hand, according to the studies of the Western Cantabrian Hydrographic Confederation, the plot is subject to the risk of fluvial flooding for a return period of 500 years, with almost 50% of its surface below a depth of one meter (Figure).



Figure 20. Drafts corresponding to low or exceptional probability flood (T=500 years), in metres. Source: Cantabrian Hydrographic Confederation, own elaboration.

Muros de Nalón has had its own general planning since September 2009. However, as a result of an uneven urban planning process, the planning applicable to this land is that established by the Council's Subsidiary Rules for Municipal Planning finally approved in 1996, that classify the area as suitable for development for predominantly residential use with a buildable area of 0.35 m²t/m²s. This urban planning regime is out of tune with the environmental characteristics of the area and the risks to which it is exposed.

On the basis of a characterisation of existing plant communities and an assessment of fluvial and marine flood risks, proposals in this subarea will be oriented towards:

The renovation of the existing fabric, providing new spaces and facilities to house productive activities that generate employment linked to active tourism, recreational boating and, in a broader vision, to the Blue Economy and the Green Economy, reducing climate risks through nature-based solutions, and respecting the ecological value of the environment as a resource to singularise the intervention and provide it with improved environmental quality.

An efficient rearrangement of productive uses that results in an extension of the space occupied by the marshes, solving the access to this area for the public's use and recreation in the terms established for project area B.

The reorganisation of the space and the redesigning of the edge of the dock, in plan and section, resulting in improved accessibility to the sheet of water and improved operating conditions for active tourism companies and other productive activities. The foreseeable and desirable relocation of the currently moored dredger will contribute to these objectives.

Designing spaces for new economic activities is also the challenge of the L'Arena dock project, although here the environmental conditions are substantially different. This landfill is in direct contact with the urban core, and currently houses a fishermen's warehouse, jetties, a slipway, an esplanade divided by an access road to the dock, an area demarcated as a dry marina and several parking areas, all of which are unassembled in the overall scheme. In the landstrip in contact with the nucleus, where hotel and catering activity predominates and the fish market building is located, are the headquarters of the North Port Nautical Club and the "Puerta del Mar" Interpretation Centre (the old Casa del Mar), a public space surrounded by roads (Figure 22).

The objectives of the proposal in this subarea will be:

To achieve a friendlier and urban relation between the port area and the surrounding fabric by rationalising the distribution of the space occupied by the road network and car parks, re-qualifying public open spaces and the façade or front that accommodates the hotel and catering activities.

To meet the operational and space needs of the Cofradía de Pescadores, the North Port Nautical Club and other sporting groups whose activities take place in the estuary, by adopting an integrated approach.

To provide an open space of urban quality for various public uses, with special attention to festive and recreational activities, and that incorporates the environmental and landscape features of its surroundings.

Contribute to climate change adaptation through inclusive urban design, encouraging renaturalisation, closing the water cycle and increasing biodiversity.



Figure 21. The Club Náutico Puerto Norte building and the Interpretation Centre "Puerta del Mar".



Figure 22. The dock of L'Arena and the adjacent urban façade

7. Sources and bibliography

- Colina Vuelta, Arturo, García de la Fuente, Laura y Fernández Iglesias, Elena. 2021., *Diagnóstico previo sobre los efectos del cambio climático en los sistemas ambientales y socioeconómicos del Principado de Asturias*, Instituto de Recursos Naturales y Ordenación del Territorio (INDUROT), Universidad de Oviedo, [https://medioambiente.asturias.es/documents/646140/0/DiagnosticoPrevioCambioClimaAsturias_para+portal.pdf/95b9334d-76c1-c8ca-2b8c-91022e998fba], accessed on 27 February 2023.
- Fernández Gutiérrez, María Fernanda *et al.* 2010. *Memoria del [Catálogo Urbanístico de Muros de Nalón](#)*.
- Fernández Gutiérrez, María Fernanda, y Bas Ordóñez, Guillermo. 2014. “San Esteban de Pravia, puerto carbonero. Una valoración patrimonial industrial actualizada”, en Álvarez Areces, Miguel Ángel (ed. y coord.), *Patrimonio marítimo, fluvial y pesquero, XV Jornadas Internacionales de Patrimonio Industrial*, Asociación de Arqueología Industrial INCUNA, Gijón, pages 497-505.
- Fototeca Digital del Centro Nacional de Información Geográfica (CNIG), American photogrammetric flight series B.
- INE, Municipal Register of Inhabitants (Padrón Municipal de Habitantes).
- Instituto de Hidráulica Ambiental de Cantabria, [Estudio de adaptación al cambio climático de la costa asturiana](#).
- Ministerio para la Transición Ecológica y el Reto Demográfico. Sistema Nacional de Cartografía de Zonas Inundables.
- Quirós Linares, Francisco. 1975. *El puerto de San Esteban de Pravia*, Departamento de Geografía de la Universidad de Oviedo, Instituto J.S. Elcano, Oviedo, page 84.
- Sanz Herráiz, Concepción, y Mata Olmo, Rafael (dir). 2003. *Atlas de los Paisajes de España*, Ministerio de Medio Ambiente, Madrid.
- SADEI. 2021. *Nomenclátor de entidades de población de Asturias*, available at [https://www.sadei.es/habitantes/enlaces-directos/nomenclator_23_1_ap.html] (access: 20 February 2023)
- Servicio de Cartografía del Principado de Asturias, Sistema de Información Territorial – Infraestructura de Datos Espaciales (SITPA-IDEAS)