

MARINAS DESIGN IN AREAS OF HIGHLY ENVIRONMENTALLY SENSITIVE (CASE STUDIES)

Manuel González Moles¹, Ozgur Unay Unay², Víctor Jiménez García³

INTRODUCTION

The calm always comes after the storm and, in our case, after a period of economic circumstances which were unfavorable for us, the sharp improvement in the nautical sports sector has resulted in the need for new mooring points, whether it be through expansions or new locations. The latter, given the degree of occupancy on the coast as well as the correct environmental protection measures to be applied, are very complicated to place.

As a result, innovation, environment, development, land-use and sustainability must join forces in order to find products and solutions with a similar effect on society, significantly decreasing the environmental impact created.

OBJECTIVE

After the recession in recent years resulting from the deceleration of the global economy, during which many sectors significantly suffered, a new phase of growth began in 2013. The nautical sports sector has been one of the stars, showing remarkable rates of improvement.

Economic progress, in addition to the traditional tendency for the population to flock to the coastal plains thanks to their milder climate, has caused the number of recreational watercraft to grow at an ever-increasing rate. In Spain, after a five-year period of decreased annual registrations, the nautical sector has recovered, as shown by the positive growth over the last three years.

In light of the progressive and immoderate evolution previously experienced, a balance between socioeconomic development and environmental sustainability needs to be reached during this new sector boom, providing innovative solutions which allow for the development of both public and private initiatives.

With this paper, we aim to open the door tourism development initiatives in those areas which were originally dismissed as being highly environmentally sensitive.

METHODS

In recent years, we have had the opportunity to design several marinas in specially protected areas. The projects for nautical sports facilities in the Río Piedras natural marshlands and El Rompido sandbar in Huelva, Spain, the Archipelago of San Andrés, Providencia and Santa Catalina in the Colombian Caribbean, and the Topocoro Reservoir, in Santander, Colombia, are particularly noteworthy, all of which have been classified as highly environmentally sensitive.

Sometimes nature gives us a hand by offering us naturally sheltered areas which don't require rigid constructions to protect watercraft that could affect coastal dynamics, provoking negative collateral effects. This is the case in the areas mentioned above. In the first case, we have the El Rompido sandbar to provide a refuge for watercraft and, in the second, a coastal reef. In the latter case the marina is in a reservoir.

¹ MSc. Civil Engineer, CEO, UG21 Consultores de Ingeniería S.L., mgonzalez@ug21.com

² MSc. Civil Engineer, President, UG21 Consultores de Ingeniería S.L., ozgurunay@ug21.com

³ MSc. Civil Engineer, PMP®, Project Engineer, UG21 Consultores de Ingeniería S.L., vjimenez@ug21.com

The area's own protection allows "permeable" structures, such as a floating breakwater, to guarantee marina operability. The energy dissipator gives way to the natural structures, leaving short period residual waves to the floating barriers.

The main design criterion in these projects has been minimal environmental impact, opting for fixed or floating jetties or ecological anchoring. This ensures minimal impact on the ocean floor, thus avoiding altering the ecosystem and ensuring coastal dynamics in the area do not change.

We would like to share the following practical cases:

- A.D.N. Nuevo Portil nautical sports facilities, T.M. Cartaya (Huelva, Spain)
- Asociación Náutica San Miguel nautical sports facilities, T.M. Cartaya (Huelva, Spain)
- Club náutico de Río Piedras nautical sports facilities, Punta de la Barreta, T.M. Cartaya (Huelva, Spain)
- Marina for yachts and sailboats on the island of San Andrés, Archipelago Department of San Andrés, Providencia and Santa Catalina (Colombia)
- Marina in Topocoro Reservoir, Department of Santander, Colombia

These marinas consist of approximately 400 moorings designed in Ría del Piedras and 160 spaces planned for the marinas in Colombia. They consist of sections of piled floating jetty, protected by a floating concrete breakwater anchored to the ocean floor.

These are ambitious marinas designed for customer use and enjoyment, while at the same time respecting the environment.

In addition to a structural design that is compatible with nature, it is essential that the marinas feature fixtures and facilities necessary to reduce possible environmental impacts. Among others, the following have been included:

- Implementing systems to use renewable energies for the power supply.
- Using energy efficient lighting.
- Bilge drainage systems.
- Removable anti-pollution barrier to avoid the escape or impede the entry of spills in case of accidental spillage and to facilitate marina cleaning.

Keeping the practices mentioned above in mind, we can assure our ability to offer modern and complete facilities for nautical recreation and its complementary activities, without any risk to the immeasurable environmental value of the location.

CONCLUSIONS

In summary, nautical activity does not have to oppose environmental conservation and suspected water pollution in the area where activity takes place. An example of sustainable activity can be set if it is properly regulated, designed and controlled.

BIBLIOGRAPHICAL REFERENCES

- Asociación Nacional de Empresas Náuticas (A.N.E.N.)
- Federación Española de asociaciones de Puertos Deportivos y Turísticos (F.E.A.P.D.T.)
- Doménech, J.L. and Menéndez R. (2004) "El papel de los puertos marítimos en la conservación de la biodiversidad y en la gestión integrada del litoral", authorship of the conference VII CONGRESO NACIONAL DEL MEDIO AMBIENTE