

# FLUVIAL TERRITORY: Restoration space

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Produced in 2010; Edited and Published by CIREF and Wetlands International European Association in 2014.  
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Wetlands International and CIREF gratefully acknowledge support from the European Commission. The contents of this publication are the sole responsibility of Wetlands International and CIREF and can in no way be taken to reflect the views of the European Union.

## About CIREF

The mission of the Iberian Centre for River Restoration is to revert the trend of degradation that river ecosystems undergo at present.

CIREF is an independent, non-profit organization. It is constituted by a group of professionals linked to river restoration in the Iberian Peninsula, coming from universities, authorities, private consultancies and non governmental organizations. For more information, visit:

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## Suggested citation for this technical note

Ollero, A.; Ibisate, A. and Elso, J. (2014) Fluvial territory: Restoration space. Technical note 1. CIREF and Wetlands International. 9 pages

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# FLUVIAL TERRITORY: Restoration space

## 1. Fluvial territory: concept and usefulness

In natural circumstances, the river systems have their own space which has been sculpted by the water rising and that is made up of the riverbed and by the riverside. Their dimensions have been defined by the main rising events of the water that said river has been subject to. Notwithstanding, in most of the river courses, human occupation of the valley bottoms has progressively reduced the natural space of the river. This narrowing of the river passageway has reached its maximum in the last fifty years, causing critical environmental problems, as well as a noticeable increase in social-economical damages in processes of growths and floods.

Faced with this problem of occupation, deterioration and risk, the main solution, marked by common sense, would consist in returning at least a part of that usurped space to the river system, where possible. This space is known as Fluvial Territory, a highly debated concept, which has had several names over the past years: room for rivers, *espace de liberté fluvial*, free space for rivers, space to move, river widening... The Spanish use of the term "Fluvial Territory" (*Territorio Fluvial*) was established by consensus in the National Strategy of River Restoration, in which this solution was proposed as one of the most interesting possibilities of restoration for rivers, hence the concept can now be considered as consolidated.

The Fluvial Territory can be defined as the terrain, space or landscape dominated by the river system. It is a space of the river, which includes the riverbed, the riverside passageway and, total or partially, the floodplain. And it is a space to defend, which clashes with the socio-economic interests on the river network. It is a geomorphologic and environmentally active band, of maximum efficiency and complexity as a natural system. It should be wide, continuous, floodable, erodible, undefended and non-developable. It requires eliminating the margin defences and removing or moving the moles. Its limits are precise but should not be permanent, thus they must adapt to the river mobility. It

should be a figure of spatial planning, specifically, an adaptation to the river dynamics.

The Fluvial Territory would be, therefore, a space of sufficient width and continuity that would retain or regain the hydro-geomorphologic dynamic, obtain a continuous riverside passageway that would ensure ecological diversity (Habitats Directive, 1992/43/CE) and the bioclimatic function of the river system, comply with a good ecological state (Water Directive 2000/60/CE), laminate the avenues naturally (Flood Directive 2007/60/CE), solve management problems of floodable areas, as well as improving and consolidating the landscape around the river. This solution is applicable to any river system and to any type of waterway, although it can reach its highest usefulness in plain systems with remarkable potential width of its riverside passageway and with problems of risks due to erosions and floods.

The Fluvial Territory is scientifically consolidated as a model for action and is technically feasible. Interesting experiences have been developed in France, Germany, Holland, Switzerland and the U.S.A. However, in the Iberian Peninsula, there is reluctance in political and administrative areas and is still not valued as a solution measure for environmental problems and risks. Only a few recent initiatives of acceptance of controlled flooding in agricultural river spaces have emerged. In such cases, however, by not accepting river erosion, as it can lead to loss of private property, genuine river territories have not been achieved, only temporary flooding spaces.

## 2. Delimitation and cartography. Examples.

The Fluvial Territory should be delimited by geomorphologic, ecologic and historical (river evolution) criteria, and not have any permanent limits, but should be studied periodically, precisely, to continuously adapt to the river dynamics. For the delimitation process, as has been carried out in different studies, the criteria that are reflected in the following chart have been followed.

**The following should be included in the Fluvial Territory**

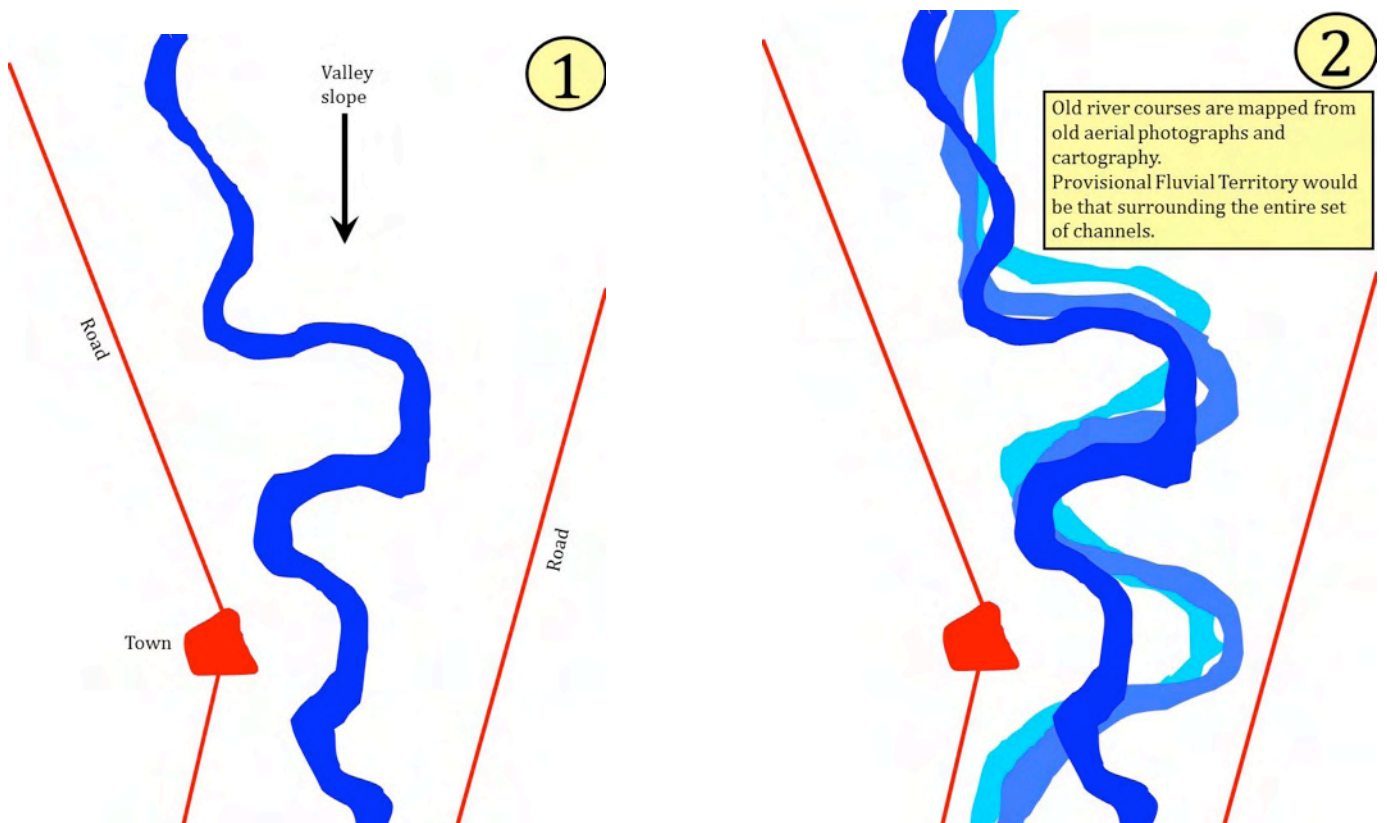
- The various paths of the riverbed, at least those of the past century, referring to old cartography and aerial photographs for this.
- The maximum extension of the riverside passageway in, at least, the last century, defined from the same cartographic and photographic sources.
- Abandoned meanders, isolated masses of riverside plant life and other possible river annexes that are not connected to the riverside passageway.
- Land susceptible to becoming eroded in the coming decades by the dynamics of the channel, defined based on the analysis of the evolutionary tendency of the riverbed and on the criteria of river geomorphologic experts who develop the delimitation process.
- All areas flooded by the growth of the river in the past 5 years (for big rivers) or in the past 10 years (for smaller rivers). This criteria can be modified on the basis of local characters and from the hydro-geomorphologic and hydraulic analysis.

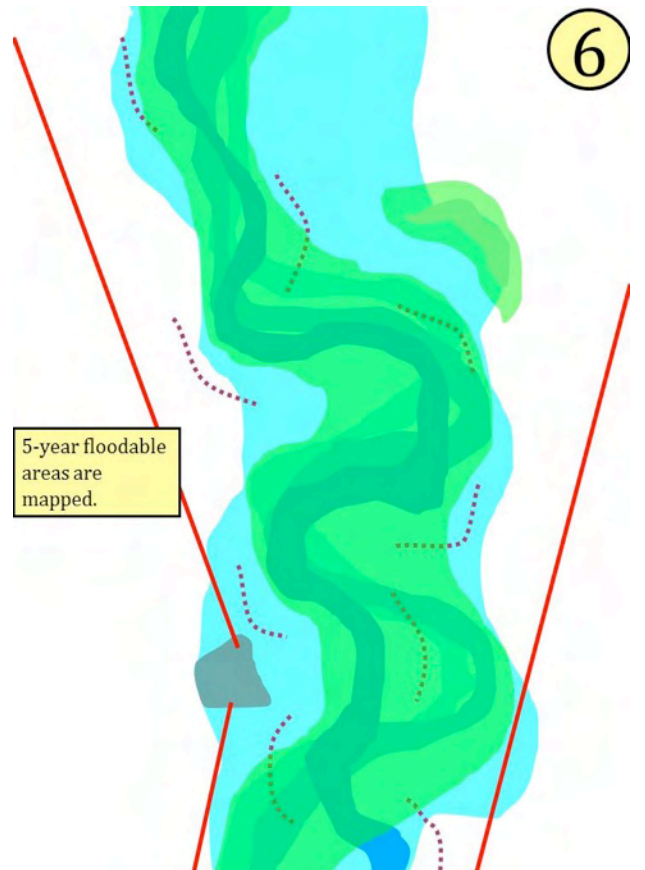
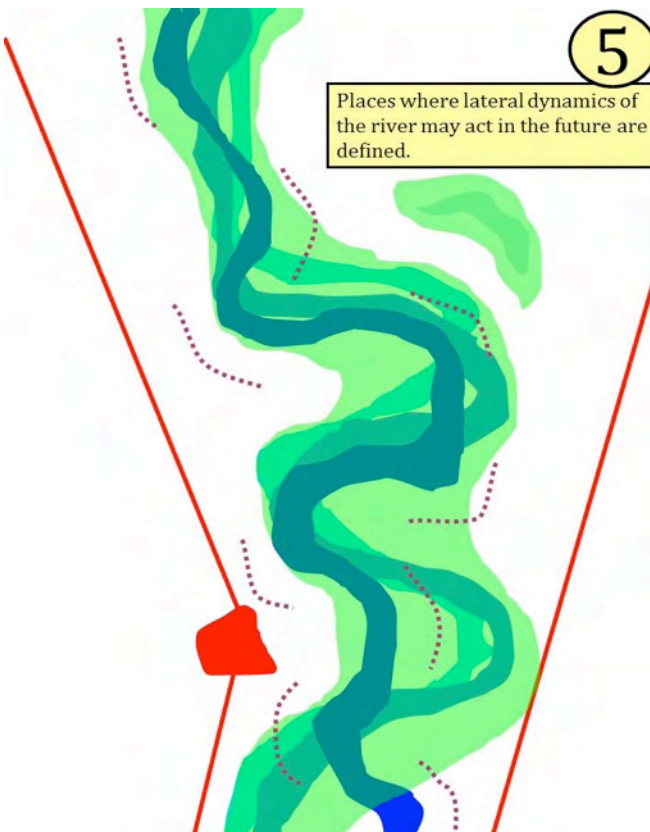
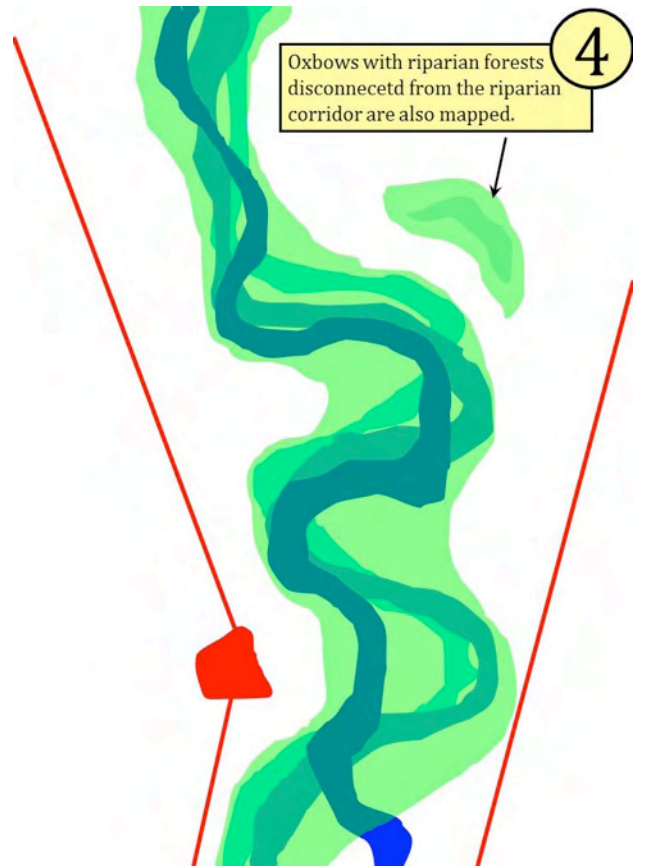
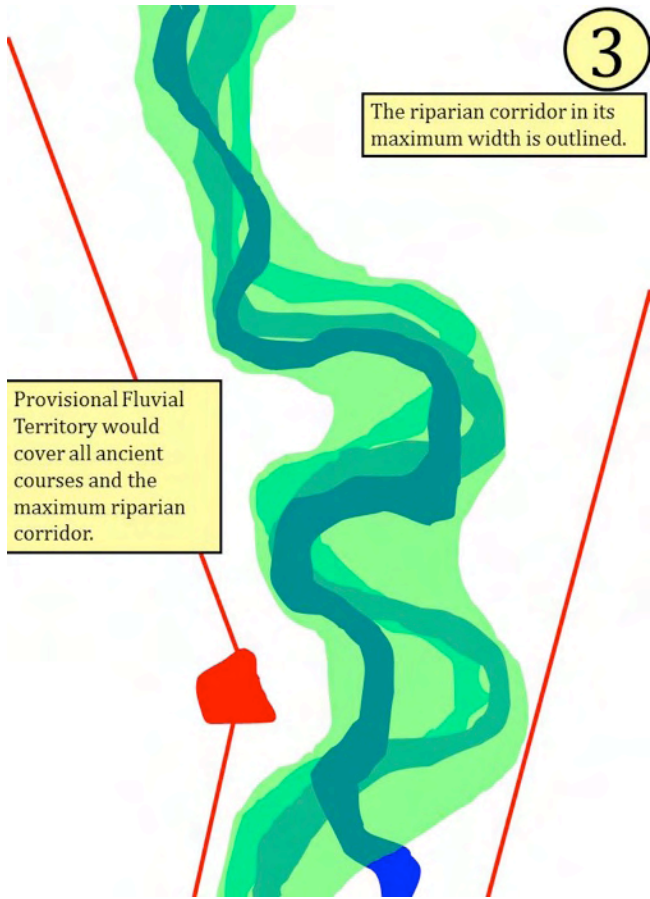
**The following should not be included in the Fluvial Territory.**

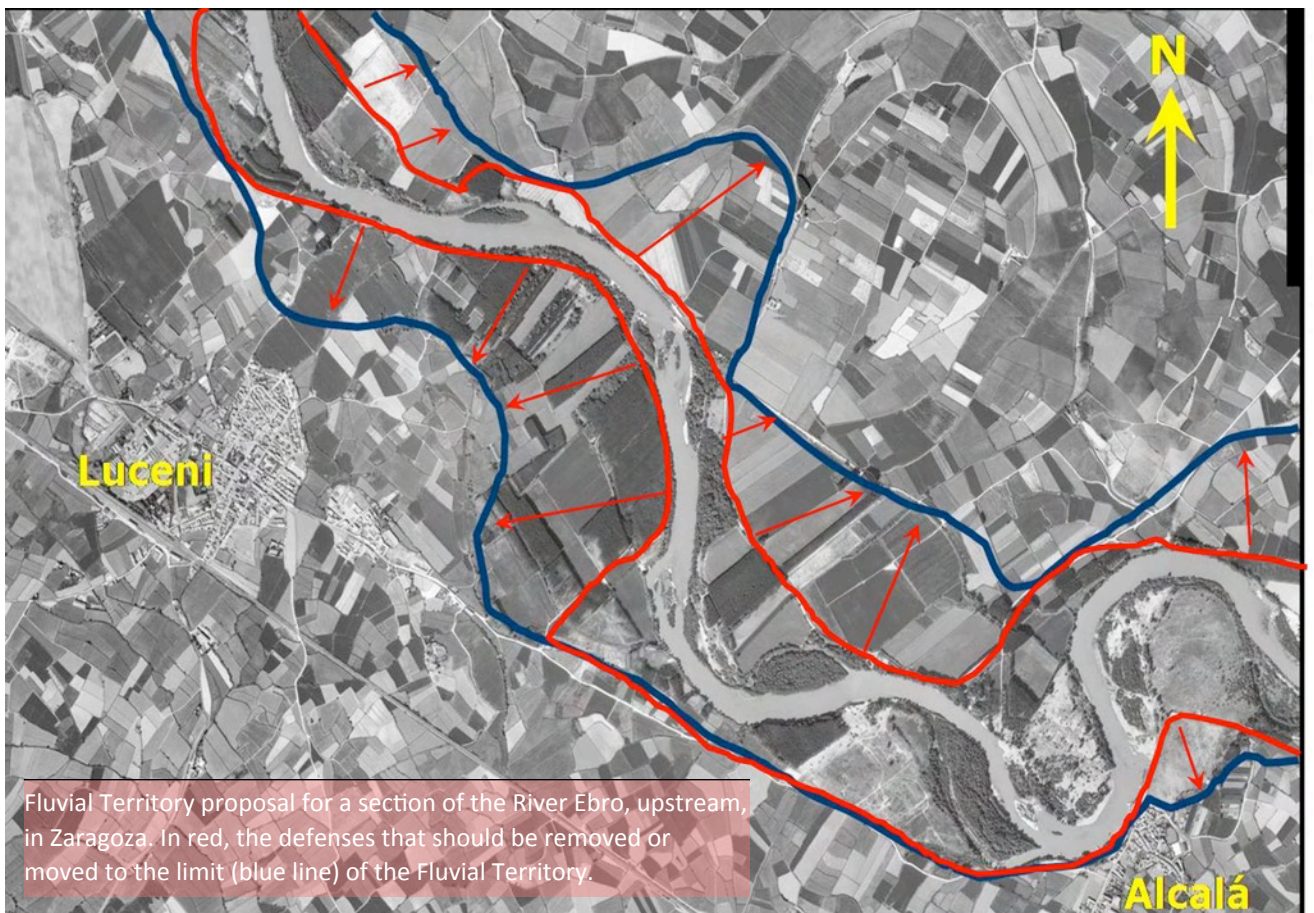
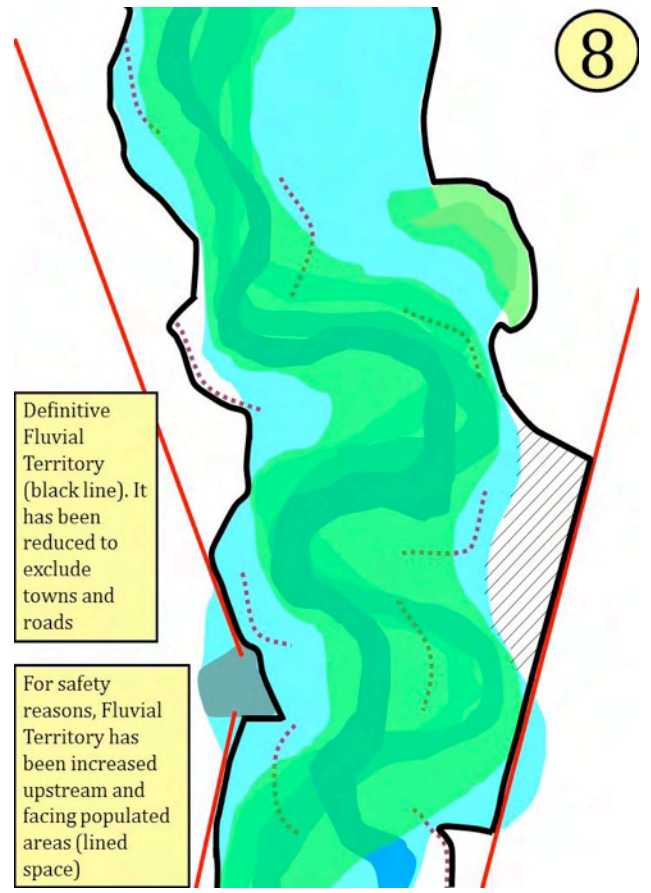
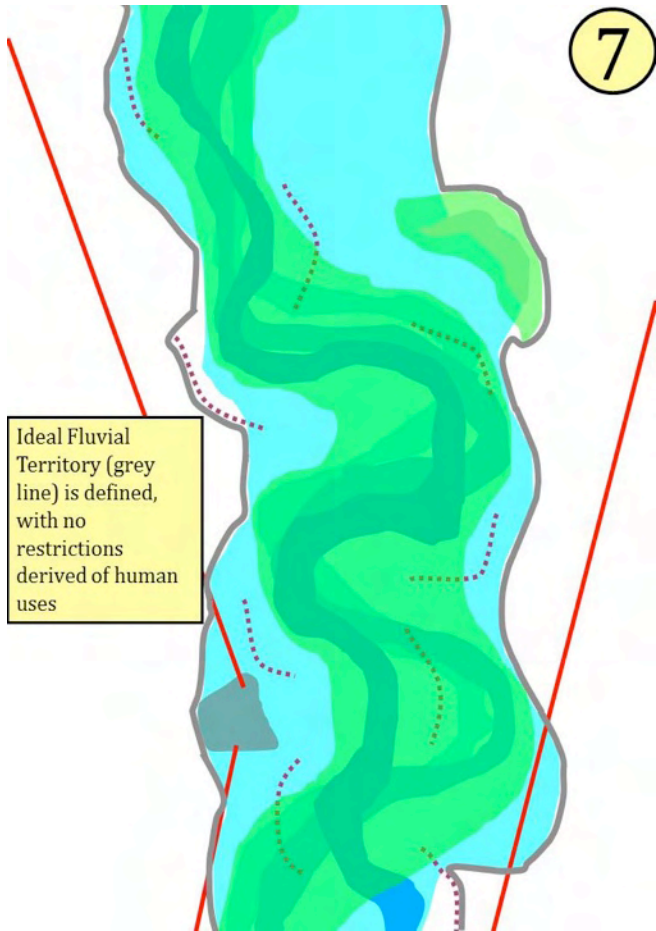
- Populated areas.
- Some consolidated human uses, at the discretion of the delimiters.

This delimitation process is completed with the Fluvial Territory cartography. The different criteria explained are integrated in a Geographic Information System, with the external limits of the River Territory

being a result of their integrations, one on each side of the river course, as is explained in the following bullet points.









### 3. Solutions for application difficulties

Applying the Fluvial Territory has major difficulties in most of the rivers: property disputes, multiplicity of uses and interests of complicated compatibility, inherited situations, etc. The widespread implementation of the Fluvial Territory would mean a real revolution in river management. In the current situation, the main difficulties of implementation in the river systems of the Iberian Peninsula are:

- The huge economic and urban development pressure on the valley bottoms.
- The interest in maintaining the current status of the river network as a source of resources (water, sand and gravel, the spaces themselves...).
- The slow and incomplete implementation of the European environmental directives, especially the 2000/60/CE, to which the scarce influence of this on the hydro-morphologic indicators and the severity of the impacts that modify these, must be added.
- Faults in policies on public spaces, such as the Hydraulic Public Domain, and the convergence of different administrations in the management of river space.
- The consolidated legal protectionism with private property, mostly from illegal occupation of river space.
- River erosion is seen both social and administratively as a loss of land that can lead to legal conflicts. Thus, a Fluvial Territory can be admitted to overlay floods, but not a mobility space with any margin defences.

- The lack of financial resources of the local administration, which seems like the most predisposed to this initiative.

In spite of the difficulties described, it is possible to find some points which may serve as a base so that applications of the Fluvial Territory can arise in the Iberian Peninsula on a medium and long-term base.

- Figures related to the Fluvial Territory (River Area, Hydrological systems and Flood Area) have appeared in Hydrological and River Management in Catalonia, that have been transposed in the Llei d'Urbanisme Regulation.
- The scientific and technical work of environmental and river system specialists and initiatives such as the National Strategy of River Restoration or CIREF, that should rise social awareness on this subject.
- The interest of many local bodies of solving their risk problems, which has led them to contemplate the Fluvial Territory as a useful and feasible possibility.

For example, one of the most advanced actions of the Peninsula in the implementation of a Fluvial Territory is that which is being carried out in the low stretches of the rivers Arga and Aragon (Navarre). Already, in the technical progress of the management plan of the SCI ES2200035 (2007), the "continuous river space" was proposed as one of the fundamental elements of biodiversity preservation.



Subsequently, under different projects co-financed by the European Union, some of the proposals have been implemented, through which the Fluvial Territory has been put into practice, at least partially, as a solution for biodiversity preservation, risk management and the management of land uses.

The most important action has been put into practice in the framework of the LIFE project "Ecosystemic Management of Rivers with European Mink", awarded by the European Commission as "Best of LIFE Award", within which, the recuperation of the habitat in floodplains of this species at risk of extinction, is being worked on. In this project, the Fluvial Territory has been established in some experimental areas through the removal of dykes or breakwaters, managing to recover, in some sections, the naturalness of the floodplain. The recuperation of this territory has mitigated the risk of floods downstream, as was verified in the town of Funes during the winter of 2007. The recuperation of the floodplain has also made the restoration of the riverside forests possible, as well as the creation of small wetlands, habitats which are quickly colonised by the European mink and other species such as the otter or the European tortoise. Besides from these actions, a communication campaign has been developed to explain to the riverside towns this new concept of river management and its benefits.

There is an urgent need to achieve putting into practice the Fluvial Territory in our rivers, as examples of demonstration that may encourage other cases and also to carry out a scientific monitoring on the processes and tendencies of these spaces. In the current situation, it would be feasible for many river systems to achieve a Fluvial Territory in a relatively short period of time, if a strong willpower existed from the managers of the territory for that purpose. An initial financial investment could be necessary to remove defences or move them to other areas, to buy or confiscate lands, to favour changes in the uses of the land and to co-finance insurances for those owners who would prefer to keep their activities within the Fluvial Territory and, thus, at the expense of the river floods and erosions. However, if the Fluvial Territory were to be achieved, the necessary restoration of the river and riversides would be carried out mainly by the river itself, so it would work out very cheap.

Within the Fluvial Territory and based on a correct rezoning of land uses and promoting compatible uses with the flooding and the biodiversity preservation and restoration, it would be possible to maintain sustainable human activities. But, above all, what would be achieved with this proposal is that the rivers will be actual rivers and will be able to function as such.

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Floodplain of the River Ebro, upstream of Zaragoza. Flood of April 2007.

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