More than River

Attuning to the rhythm of the Meuse landscapes

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Master Thesis in Landscape Architecture

September 2024 - June 2025

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Unless otherwise stated all graphics and pictures by author

Foreword

This thesis is a personal and academic exploration in revealing and transforming the physical and cultural landscapes of a symbolic river for the geographies of my education, the Meuse.

Engaging with a part of the territories it shapes through its flow, I felt alive with this river throughout the research and design process documented in the following pages.
Since it takes time to attune to something, it took me one year to start attuning to the particular rhythm of the Meuse.

Embodying a strong connection to a mutable course of water is likely a familiar experience for most of the future readers of this work: a public composed of fellow landscapers, friends, or anyone passionate about the complexity of dynamic landscapes.



(Colored) Still from the movie Suzhou River (2000) Photo: Wang Jia.

Directions

Moving throughout the course of the Meuse, this thesis follows generally an upstream direction, dictated by the curiosity of knowing the river towards its figurative and literal source.

Most of the cartographies in the report follow therefore the orientation here right. Like myself, the journey of most of the readers of these pages, located in the Netherlands, will lead them to less documented sections of the Meuse river.

Downstream

*Downstream**

*Upstream**

Upstream

*Landscapers**

Landscapers are the ones who, through vision and the other unmediated senses, which most human beings have in common, see a complex image made out of processes[1]. As they go beyond seeing their environment as a composition of objects in their simple appearance, they start to speculate about how this composition came to be, what was there before, and what agents enacted the transformation unfolding at the time of the observation. In order to perceive, embody and transcribe this composition, landscapers stand in the field, they are *action-researchers*.

The landscapes in which we live and work present us with a sometimes inextricable tangle of layered modifications, engendered by anthropic and other organic or inorganic agents[2]. This brings to landscapers the challenge of representation, mapping (in the broadest sense) the material consequence of these complexities that transcend the human.

With a work that often encompasses the role of sensibilisation, the landscaper makes these worlds explicit to clients, the public, and at times even to the local communities inhabiting the land. Before beginning a planning action, the task of the landscaper is revealing the landscape. This resuming task could not be performed without a broad knowledge of landscape ecologies and culturalities, together with a positioning within the current theoretical debates in the discipline. As Neil Brenner puts it: "theory provides an essential means of evaluation, imagination, contextualisation, and orientation for design and planning action."[3]

Drawing from the reading and knowledge of a landscape and its dynamics, landscapers perform the preliminary, basic architecting role when being critical of landscape images that are worth preserving, or restoring, and those from which we must move away and transform. The design process starts in this conversation, informed by the current state of a place and its history, in a process that requires ingenuity and collaboration.

This transformative ability, which often flows into passion for design choices, means having, in some way, a coordinative and *choreographing role*, as a stance taken among local actors potentially collaborating towards a landscape change. Landscapers are never alone in this, and their designing role must be used before all with a sense of responsibility and care, especially when acting in territories to which they don't "belong".

Part of the coordinating act resides in the translation between different times of the landscape. In this correspondence, between the time of the human and non-human practices that land-make, and the intrinsic time of the land itself, the landscaper acts as the synchronizer, or timekeeper.

This mediating act is never neutral. Landscapers position themselves towards their environments of reflection and action with postures that vary according to their cultural background, interests, and political ideas. An older professional in the discipline once told me: "I know at least ten different types of landscape architects." Depending on the scale of recuring projects, from gardens to regional planning, engagement with theory or expertise in technique, it is a profession whose actions are difficult to describe uniformly.

Acknowledging that the landscaper's worldview is of great impact in the outcome of the transformations they contributes to enact, one final aspect should be considered.

At the present time, and in most projects, we are remedial landscapers, addressing uncaring mistakes that belong to both the past and the present. In this context, we share with other planning professions the responsibility to make passionate and daring choices, advicing for the best those who govern the territories in which we live or to which we affiliate.

1 Corboz, André. 1983. "The Land as Palimpsest." Diogenes 31 (121): 12–34.

2 Descola, Philippe. 2014. Beyond Nature and Culture. Translated by Janet Lloyd. The University of Chicago Press.

3 Brenner, Neil. 2017. "The Agency of Design in an Age of Urbanisation: Dialogue with Daniel Ibañez." In Critique of Urbanisation: Selected Essays, 224–37. Bauverlag ; Birkhäuser, part of Walter de Gruyter GmbH.

*I intentionally employ this word, rather than the more common phrasing *landscape architects*, referring to its french translation "paysagistes". I believe that the simplicity of this single noun successfully communicates the humble posture and passion involved in the relation with the land and the populations that inhabit it. Before and at the core of the architectural role, *landscapers* are for me those who embrace and affiliate to the many declination of landscape.



The coordinating role of the landscaper, through to the construction site, from the Atelier Meuse design process (chapter 3).



Learning from the landscape through on-field action.
Sedan, Feb. 2025.

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1. Rhythm 2. Evolution 3. Pressures

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In this chapter the intensive human uses of the international course of the Meuse are documented in relation to the river's rhythm: its seasonally-bound discharge fluctuation. A genealogy of the impactful adaptations that these uses imposed on the river course introduces the current state of the system; the complex entanglement of these anthropic pressures has led to a marked modification of the water, sediment and ecological unbalance in the river. Despite the limits of mapping on this global scale, the analysis underscores a disattunement of the uses to the Meuse temporal dynamics, rendered both in projective cartography and in a first *spatial river calendar*. These representations reveal the urgent need to reassess global river pressures and their prioritisation, and call for a deeper investigation of local river practices.



2. Looking upstream *64*

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A closer inquiry of river practices in the most upstream section of the Meuse, the French one, is proposed here as a cycling transect. Seasonally-informed labour relations between humans, the river, and its other non-human dwellers are documented and illustrated. The attunement of these often disappeared *water stories* to the rhythm of the river is explained through another *spatial calendar*; the stories imply a triad of relational values that can inspire designs of future practices tied directly to the river.

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By activating a fictitious *floodplain atelier* in the post-industrial landscape of Sedan (France), the design chapter is a laboratory for cultivating a collective landscape attunement to the Meuse rhythm. Implanted in this favorable location, due to the local absence of ongoing intensive pressures on the river, the proposed spatial transformation of the local floodlain addresses a threefold problematique. Flood and drought challenges, together with the issues of a declined collective relation to the Meuse and the fragmentation of key non-human habitats, are all different faces of a broken relation of this territory to the local river rhythm.

In response to this, three interwoven project values form the pillars of a phased territorial plan proposed in the Atelier. *Slowing* the river water, designing a sense of *belonging* to the territory, and *gardening* the floodplain through a seasonal and participative landscape maintenance. By threading interspecies alliances between the existing actors in the territory, the landscaper becomes the choreographer of the execution of this plan through time, facilitating new riverine practices in attunement to the rhythm of the Meuse.

This design methodology, developed in a territory where the termination of past river uses has fragilised the local relation to the Meuse, could be transfered in similar sections of the international floodplain.



Conclusion and reflection *178*

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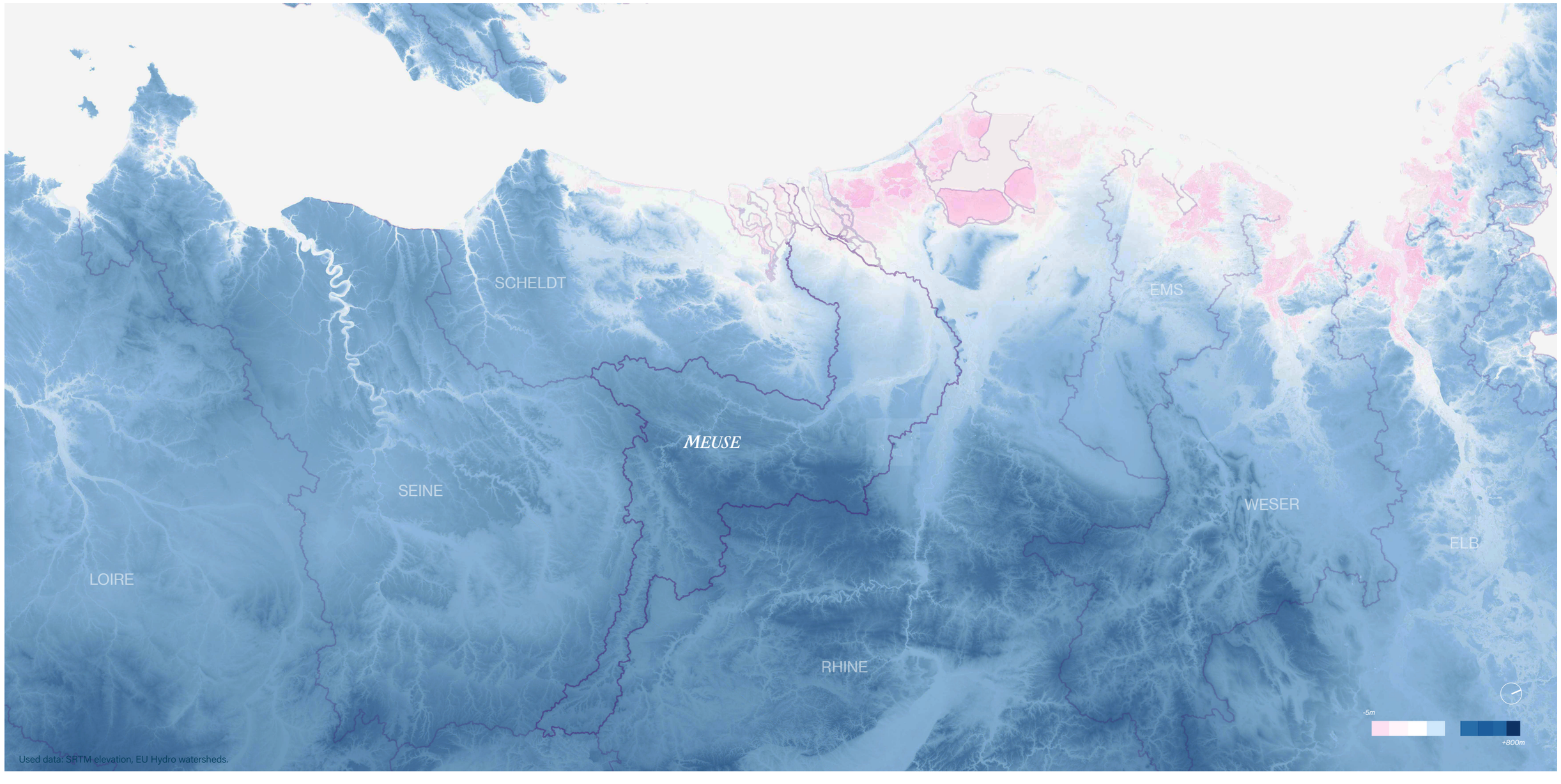
Annex
Journal de Bord de Meuse



Used data: SRTM elevation, EU Hydro watersheds.

Introduction : Meuse

0. Glossary

Before going into the problematisation of the Meuse as a rhythmic entity, it is necessary to define a number of terms that recur throughout the following introductory section of the thesis.

Meuse/Maas

The term *mosa*, roman alteration of the ancient Gallic word *mod-sa*, would mean, when applied to waters or rivers, "being fluid, spreading out" [1], not only in the direction of the flow of the major current of river, but laterally to it. Like other similar river names, this indicated a meandering body of water with moving edges, changing throughout time.

Floodplain

As the land that a river constantly covers and uncovers, the floodplain is a band around the main bed (or summer bed), with variable width and depth. This place holds the memory of recent moments of high water, and at the same time the promise of menacing yet enriching periods of new floods. It is a space of movement for the river, migrating through time in this largeness, leaving and taking soil in this cycle.
The floodplain is a trace of this motion through a deeper time, it is the "geological" river.

Watershed

Following the topography in the part of Europe it crosses, the Meuse watershed is defined as the "area of land that drains or sheds water" [2] into its linear course.
The result of this hydrological calculation, based on the ridge lines of mountains and hills in its an international territory, forms an surface of circa 35,550 km².
This extent [3] considers the water running on the surface of the continent, overlooking groundwater bodies that lie beneath bordering watersheds.

Discharge

The flow of the Meuse, measured in discharge (cubic meters of water that flow through a river channel section every second), varies considerably and inconsistently throughout the seasons [4].
As its catchment is fed exclusively by rain (unlike rivers like the Rhine, which are glacial rivers), local precipitation patterns and soil conditions are the factors that make the Meuse fluctuate in speed and level.

Sediment

Sediments are mineral particles of varying size, transported by the river after its water force carves or erodes the geological formations throughout its course. The linear transport of sediment leads to its deposit in downstream parts of the river. This can happen, however, only if the soil of the summerbed and its floodplain is movable and exposed to sufficient eroding force.
Transporation happens on average 40 to 50 days per year during moments of high river discharge [5].

Dwelling

With a larger meaning than inhabiting, this verb implies a set of actions intentionally aimed at making a part(s) of the river space one's territory to accustom it to life needs.
Making one's place along it, building on, transforming it, arranging its waters and become part of it through these actions. By dwelling, humans beings necessarily come to terms with other species, concurring, doing with, or more often so neglecting.
As Tim Ingold puts it: "the production of life involves the unfolding of a field of relations that crosscuts the boundary between human

More-than-human

This term indicates an established post-humanist perspective on earth, to include and transcend the primacy of human societies. According to this perspective, these are linked to a complex network of countless beings, sharing the ability to dwell their environment. Emerged in the 90's [7], the *more-than-human* aimed at overcoming a closed modern dichotomy between nature and culture.

Relations

All actors, agents, beings (used interchangeably throughout this thesis) are relational. Through what Bruno Latour calls their secondary qualities, actors in a network feel, see, interact with each other and influence reciprocally [8]. The nature of relations to a river can be various, from source of humidity as base of life, spiritual connection, or detached exploitation of its kinetic energy.

Practices

A *practice with* the river indicates a cultural engagement with its material flow, involving a bodily closeness to the water. In this thesis, these relations are more or less mediated Such engagements creates a relation between two or more agents: the human actor, the river and its dynamics itself, and sometimes non-human beings such as animals that intervene in the practice.

Uses

A *use of* the river implies a functional, often extractive engagement wherein the water quantity or its energy are mobilised for a productive objective. Through large-scale, organised uses, a direct relation to the river as a variable flow is often lost. Uses cast the river as a passive substrate, acted upon.

1. Fascination

Between Holland and France

A personal curiosity for studying the Meuse river system came spontaneously as a landscape fascination, when looking at the geographies that have shaped my university education in recent years.

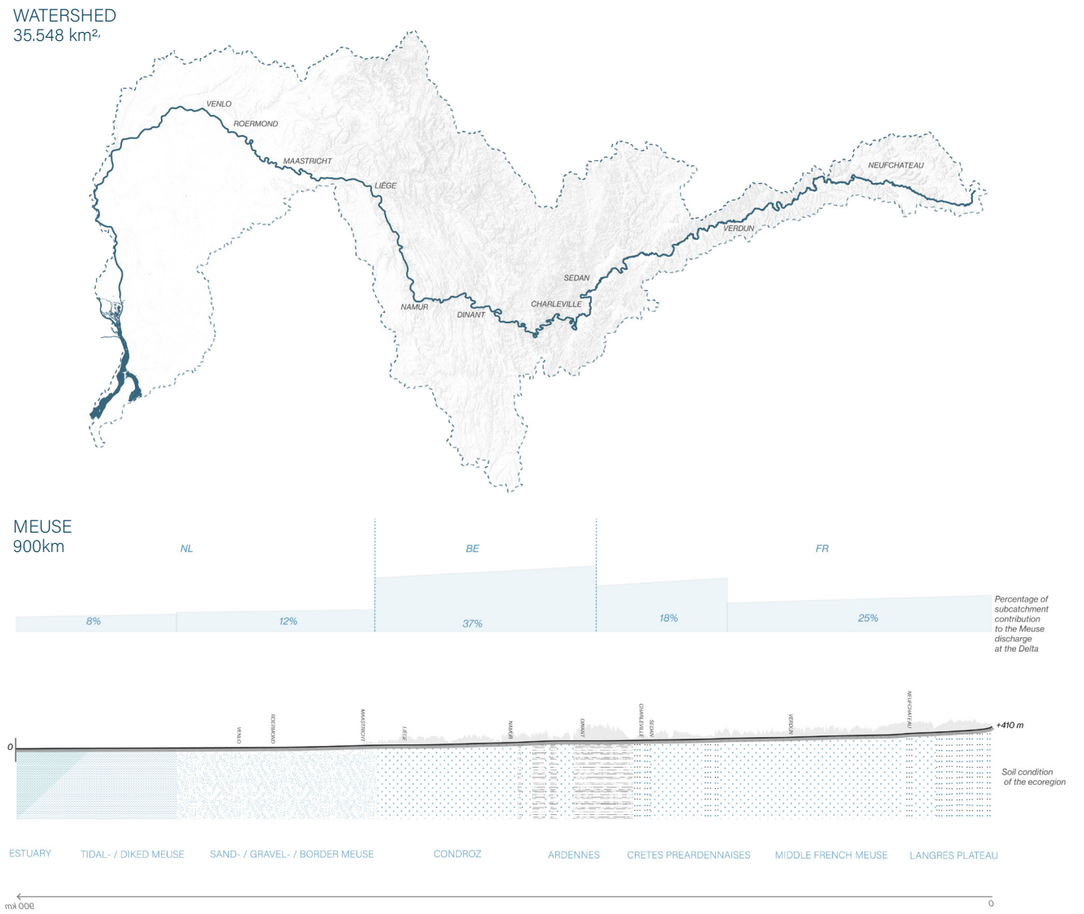
As one of the two large rivers that flow out in the Netherlands, home to the largest part of my university upbringing, I had always heard of this river through the toponymies it marks in the Dutch landscape. A pervasive entity, entering the name of many territories and cities along its current an old course, it is a fundamental component in the identity of large parts of the country.

In the discourse of engineers, urbanists, and architects, the Maas is often addressed by talking about its waters as economic driver, or as the backbone of cities like Rotterdam (that unrightfully claims its course). I had always found the “Maas” to be a consolidated fact in Dutch culture, perhaps becoming more than a river.

The idea of choosing it as terrain for a master thesis inquiry came however when studying in France, during another, equally fundamental part of my landscape architecture training.

While learning different methods and traditions of the discipline, I (cartographically) discovered for myself a timid trace in the limestone plateaus of the north-east of the country. Where other great rivers of France also spring, the Meuse carves its first kilometers towards the north, in the direction of the lowlands. At that point I remember asking myself: what is the same river in a context that has very little to share with the Netherlands, with a different cultural conception of river landscapes, with less water and different uses and practices with its course?

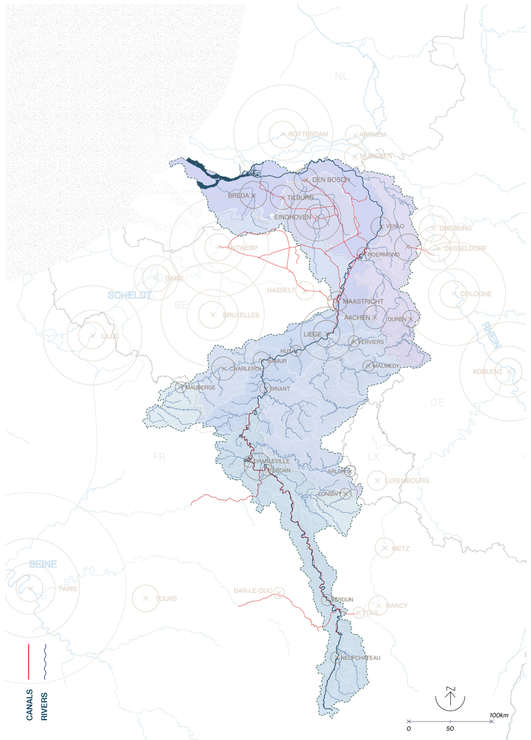
To compare, unite, and find out what my own place as a landscaper is between two worlds that share the same water, the choice for this large terrain of exploration became unequivocal.



Section of the international course of the Meuse river. Percentages of the water that eventually flows out in the North Sea are given in the table above the main section.
Used data: SRTM elevation, EU Hydro.

Meuse geography

From a hydrologist’s perspective, calculating the length of the Meuse as a line results in an ever-changing value of about 900 kilometers, from the Plateau de Langres in France to the Haringvliet mound in The Netherlands[3]. Flowing down this length, the river slowly drags sand particles and gravels towards the Dutch Delta. Along a gentle slope (half a meter per kilometer of length on average), the waters runs through different sections, eroded through the Jurassic Parisian basin and the Paleozoic massif of the larger Ardennes[9]. This means that the flow of water we now call the Meuse has been carving the land and depositing it downstream for more than 250 million years.



Map of the international Meuse watershed, divided in subcatchments.

Used data: EU Hydro, OSM.





1. Estuary/North Sea (NL). After the Biesbosch the Meuse waters enter a succession of very wide estuary sections, the Hollandsch-Diep and the Haringvliet, under the tidal influence of the North Sea.

The Meuse is not a single landscape. This river shapes a rich a variety of sights and cultures, influenced at the hearth by the different hydrogeological conditions of the local soils. Researchers have distinguished seven main sections, degrading from calcareous to siliceous, through which the Meuse slowly carves its way. From the land of sources, the Langres Plateau, to the estuary on the North Sea coast, one can start to read in these profiles of the river traces of its occupation.

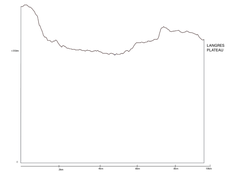


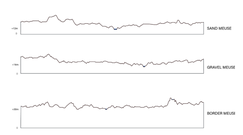


2. Land van Maas en Waal (NL). The river flows wide between high dikes, in a straight line draining water towards the sea.



7. Langres Plateau (Fr). The Meuse is everywhere on and in the sandstone soils. It is jealously stored in the mist and the many watertowers that punctuate the landscape.





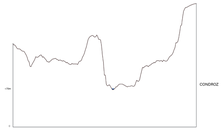


3. Kempisch Plateau-Kempen (Be-NL). Regroups a succession of three river stretches, with different widths and features. Border Meuse, Gravel Meuse, Sand Meuse are successive landscape types in NL.



6. Middle French Meuse (Fr). A small meandering river on chalk and marl, with low plains often flooded during the winter. In between the few villages on the edge of its floodplain, it makes its own rules.



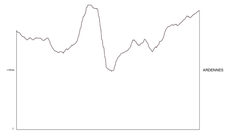


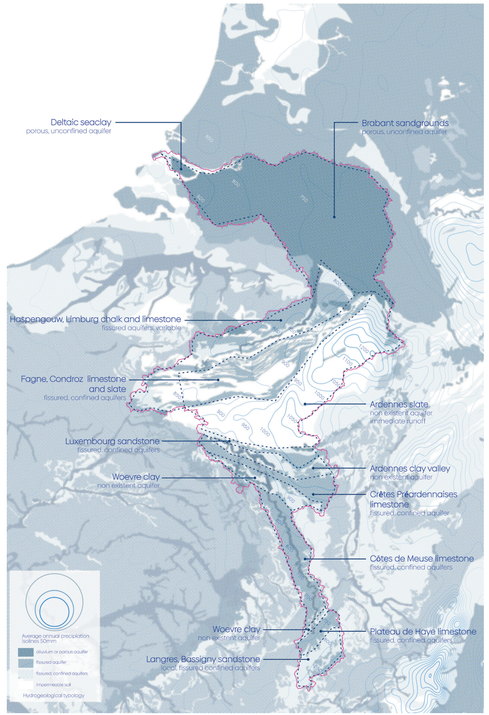


4. Condroz (Fr-Be). A slow, wide river in a narrow valley, almost entirely urbanised..



5. Ardennes (Fr-Be). After a transitional section, through the limestone cuestas of the Cretes PreardennaisesThe Meuse flows fast through a large channel carved in the slate massive. Linear towns engage in a close relation with the cold waters.





Map of the hydrogeological condition of the soils of the Meuse watershed, with the isolines of local precipitation patterns: these are the climatic and soil conditions for the different Meuse landscapes.

Used data: International geological map, EU Hydro, Copernicus Climate.

2. Statement

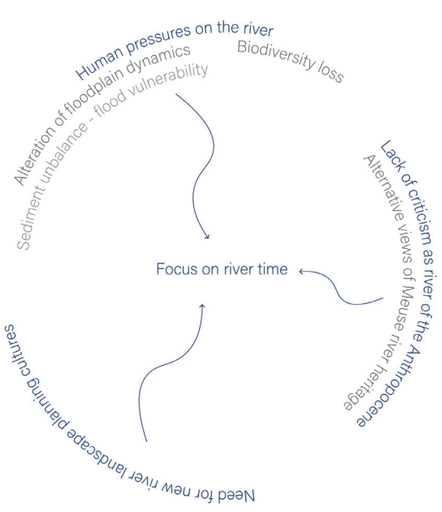
Framing

The Meuse river is a complex, layered landscape phenomenon, requiring interdisciplinary hydrological, landscape, and urbanism knowledge to understand it throughout its scales. Beyond picturesque images of its waterscape, or the strictly utilitarian understanding of its water flow, the Meuse cannot reveal its dynamics at first glance, under its current appearance as one of the most anthropized rivers in the world[1].

At the start of this research process, in September 2024, I attended the annual Meuse Conference held in Liège. In this setting, that reflects most of the available academic literature on this river, the Meuse is the subject of complex water management discussions, focused on it as an international data flow of water quantities and qualities. After this personal introduction to the topic of the Meuse, I started to work on an own framing of this river, closer to its poetics as a mutable flow of water.

This required undergoing an initial review of the many crises that modern river planning engendered on it, acknowledging current alternatives framings of river territories in current academic research, and introducing different planning cultures that coexist in the Meuse.

What follows is the research statement forming the base for the development of my research and design process. A common ground to the three introduced problematiques lies in an intuitive framing of the research around the intrinsic time of the Meuse river, albeit its rhythmicity..



Three problematiques lead to making the intrinsic time of the Meuse central to the research,.



Spring recreational activities on the Meuse in Ravenstein, May 2024.



The Prayon factory (phosphates producer) in Engis, Belgium. Photo: Clemens Rikken.

Human pressures on the Meuse

A complex entanglement of causes

Throughout its course the Meuse carves since Jurassic times a diverse succession of alluvial valleys, inhabited by a multitude of species that benefit from the flow of water, fertile sediment deposits and lush riparian microclimate[3]. As one among the dwelling species of this river, the human has become since roman times[9] the dominant force in modifying and commodifying this water system. For uses ranging from survival to increasingly organised food, building, and energy productions, it has canalised the river flow and encroached the space of its floodplain with settlements, infrastructures, industrial and recreational facilities[3]. In the current time these pressures are proven to be threatening or permanently damaging to the river environment[1].

A degradation of water quality leading to biodiversity loss, together with alterations of floodplain dynamics such as sediment unbalance and reduced space for floods, are all issues that have been documented throughout most of the river course, particularly downstream of the French border[3].

To these human pressures on the river environment and its cycles, followed in the last years the consequences of humanly induced climate change on the river discharge.

Next to a shorter period of return of damaging floods[10], wetter winters and significantly drier summer months are increasingly changing the Meuse dynamic conditions towards 2100[11]. Facing prolonged droughts, experts deem highly unsure whether all the intensive uses of the river water will remain possible in a near future[4].

All of these trends involve complex causes and effects for the Meuse water quantity and quality, with the temporal aspect of the river central to these oscillations. It is therefore urgent to clarify and reveal the role of human actions within the shifting temporalities of this river system.

The global river

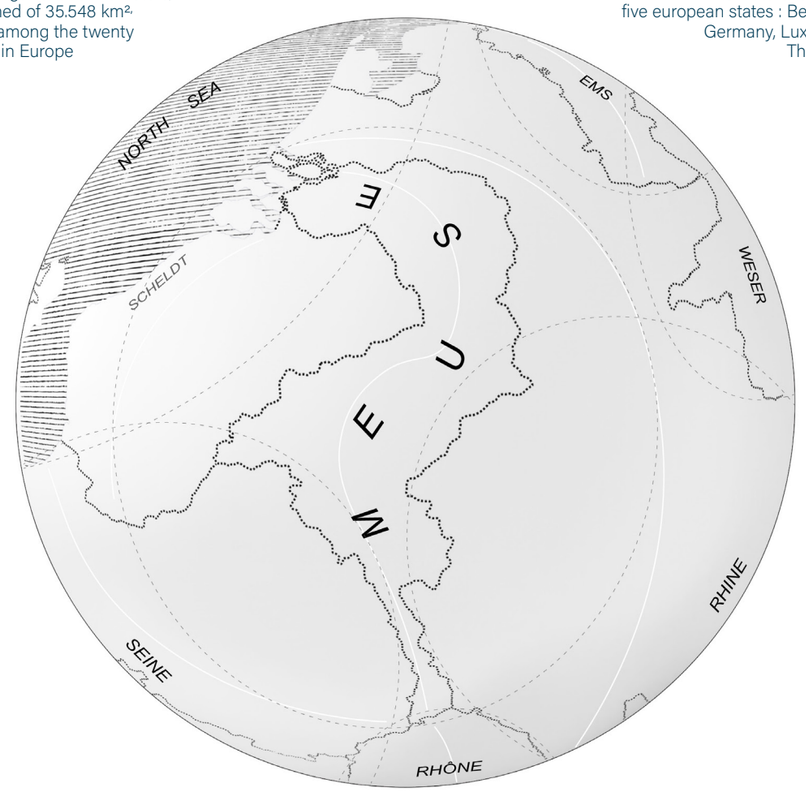
Water policy makers and advisory boards in the three countries crossed by the Meuse pursue since more than two decades international projects and agreements to coordinate intensive uses of river water in the afore-mentioned changing climate[12]. With stances that logically retain a rather anthropocentric perspective, these productive goals run parallel to European goals of river habitat restoration of the river body and its tributaries. The need of legislating and spatial-planning simultaneously on these two tracks leads to an increasing international complexity, causing water managers to call for a difficult holistic governance on the scale of the watershed[4,13].

This global framing (right) operates on many levels on the entirety of the river, for example in the form of spatial planning visions addressing the post-modern conflict between economic growth and non-human conservation needs[20]. Current coordination between different governances in the watershed also benefits from this view, to internationally monitor critically low discharge periods, or assess the water quality and its pollutants[14].

In this sense, the availability of institutional data about the global Meuse floodplain makes this scale the most immediate to reveal the entanglements of this spatial network of actors.

With a total length of 908 kilometers, and a watershed of 35.548 km², the Meuse is among the twenty longest rivers in Europe

Its watershed is shared by five european states : Belgium, France, Germany, Luxembourg, and The Netherlands



The International Meuse Commission (IMC)
is an intergovernmental organisation, established in 2002 to promote cooperation among the countries of the Meuse River basin.

Its missions include the coordination of:
- the goals of the European Water Framework Directive,
- the obligations of the European Directive on the assessment and management of flood risks ,
-to provide advice and recommendations for the prevention and control of accidental pollution (warning and alert system).

Lack of criticism

A river of the Anthropocene

When looking at other european river systems, it is clear that critical stances on the humanly induced modifications of these aquatic environment can be found in a variety of both scientific and humanistic transdisciplinary scholarships. Biologists, anthropologists, and environmental philosophers among others, challenge the dominant and external stance of the *sapiens* in river landscapes, engaging with these waterscapes within the conceptual framework of the Anthropocene[16]. Acknowledging the destructive agency of modernist planing offers alternative perspectives on the more-than-human relations rivers entail. Through operational applications of these theories, a number of riverine landscapes in Europe start to be the scene for an inclusive involvement of silent stakeholders in their planning processes[17].

In the case of the Meuse, there is a clear lack of literature on projects undertaken to reveal and adapt this environment as an assemblage of agents beyond human dominance. As in current research on other rivers, this would mean for instance giving right to the body of water and the non-human actors involved in its system[18,19], or retrieving stories of reciprocity between the river course and its dwellers.



Meuse sediments from different geological formations found in Limburg. Source: Tebbens, 1999[9].

Riverine heritage and relationality

Professor in heritage studies Christian Ernsten, one of the few scholars that have critically engaged with the state and fate of the Meuse, refers to it as a "ruined river landscape"[20] in respect to the progressive functionalisation of its flow.

His position contrast with optimist institutional views targeting renaturing and the inclusion of ecosystem values when planning small stretches of the river , as a compensation for the private extractive and industrial exploitation of the majority of its course. Ernsten advocates for a progressive detachment from "a capitalist and technoscientific approach to nature", informed by the tracing of an history of the dwelling of Meuse by its multi-species communities.

Documenting the progressive fading of local human-river relations in recent history (right bottom) could help retrieving heritage values for the Meuse waterscapes in the age of the Anthropocene. Ernsten proposes an *archeology of more-than-human relationalities*[20], as a potential method to inform future ways of being with the river.

Such a reading of the Meuse landscape, as an history of human and "natural" processes, has by now only been attempted by a Dutch scholarship in geography, focusing on the entanglement of geomorphological events and cultural practices shaping the Meuse valley in Limburg. This *landscape biography,* by Jan Renes[21], covers however only a small part of the entire river floodplain.

Studies about other sections of the Meuse are needed to understand and illustrate fading or lost riverine relations: a body of situated knowledges[22] in which the role of non-human actors in the cultural evolution of the river is equally clarified.



Still from the documentary about the project "Drinkable Meuse". This initiative, led by Lin An Phoa since 2018 and strongly influenced by post-humanist environmental philosophy, aims at coordinated lobbying actions across the Meuse catchment, to recover the water quality of the river. Photo: VPRO.



Extract from a XVII century land map picturing the course of the Meuse between Namur (Be) and Charleville (Fr), enriched by details of land uses and practices in the floodplain such as fish traps and deepened navigation channels. "Carte particulière du cours de la rivière de Meuse depuis au-dessus de Mézières jusqu'au dessous de Namur", Claude Masse. Source: BNF.

A need for new river landscape planning cultures

The Dutch model

While the International Meuse Commission attempts at an integral water management coordination of the river, its institutional landscape remains deeply fragmented[14], with planning approaches along its course varying significantly.

In the Dutch stretches, a long national history of negotiating with water has produced a distinctive contemporary planning culture[23], where flood safety is interwoven with flexible landscape design through time. Projects such as the Ooijen-Wanssum floodplain widening illustrate this[24]: to dike the river in vulnerable urbanised sections, the floodplain has been designed by the firm H+N+S to accommodate more water seasonally, at the same time creating a new recreation and nature conservation area.

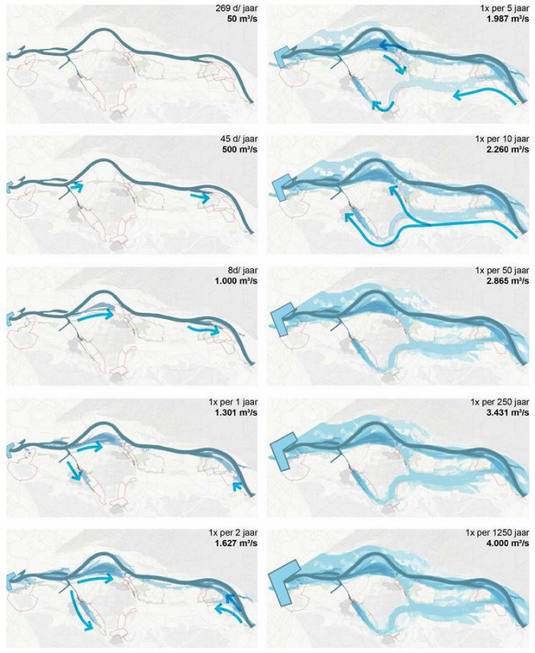
In another recent Meuse planning project, in Venlo, time flexibility is embedded in demountable embankments manouvered by volunteers, involved in their ongoing maintenance. In both exemples landscape planning is a spatial and temporal practice where local communities engage more or less directly with the changing dynamics of the river over time.

Upstream planning cultures

Further upstream the Meuse, in Wallonia and northern France, river planning takes on a different character. Here "River contracts" focus on implementing European directives for flood safety and ecological restoration[25]. These are typically led by regional water authorities , and unfold within a technical and regulatory framework in which spatial interventions on the river course are often small, punctual projects with ecological restoration and flood safety as objectives[4].

Yet in the French context, a parallel tradition is opening up different possibilities in river planning. Projects like the Loire Parlement[26], or the Seine integral planning document[27], actively involve inhabitants, artists, and landscape professionals in co-constructing new narratives and representations of their local river, towards radical transformation. Participation here becomes a generative act, transforming perceptions of the river as a shared landscape to live with and protect from negative pressures like accidental pollution or impactful infrastructural projects. The Loire project begun with symbolic acts like assemblies with the river (above), which now resonate through to the integration of these participated debates in regulatory instruments like local urbanism plans.

Across the Meuse basin, these different national approaches to river planning remain largely disconnected, although being a potential resource for composing new, time-sensitive and participated planning cultures.



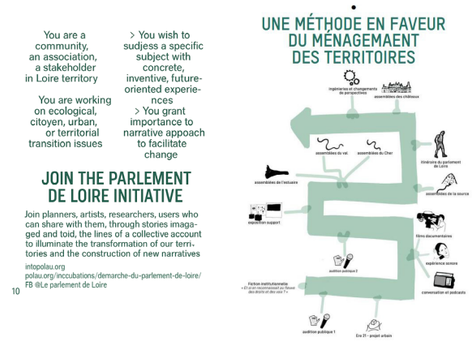
Calendar of the Ooijen-Wanssum floodplain widening project, with different river channels hosting the water flow in different discharge conditions.
Source: Beenhakker et. al, 2022[24].



Cultural urbanism project "Loire Parlement": The Blue Chairs by Ligere, inspired by the work Assemblée immatérielle, device for landscape debate by Zazü.
Photo: Bruno Marmiroli.



Demountable embankments in Venlo, used in places where views of the Meuse are important to keep. In case of high-water, a group of volunteers quickly mounts them.
Source: Meurs, 2017[23].



The "Loire Parlement" projects resonates through the scales of the water basin, and is used in the processes that lead to the the design of local urbanism plans.
Translated by author. Source: POLAU, n.d[29].

3. Questions

Concise statement and research objectives

We witness a time in which human uses perpetuate major disruptions to the hydrologic cycle of the Meuse and the life of other species dwelling it (bottom), while the same uses are themselves endangered by the local consequences of global climate change. In this age called Anthropocene, critical stances and innovative reimaginations of other river territories start to emerge, while the Meuse remains scarcely addressed. Taking the opportunity of reinterpreting this water course as an entanglement of more-than-human relations, this graduation project aims at:

-Clarifying and revealing the impact of human uses of the river within the shifting temporalities of this water system.

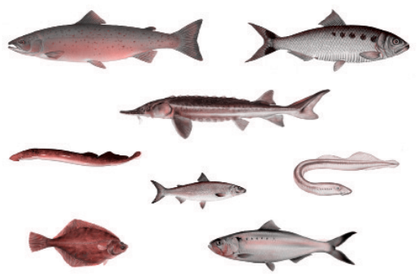
-Acknowledging and illustrating the agency of the river through a plurality of situated, more-than-human practices with its water.

-Experimenting with a landscape planning methodology to enact a spatial transformation of a Meuse section, adapting its floodplain landscape to local time-bound challenges, and fostering riverine practices in close relation with the river.

Main research question

These objectives lead all together to formulate an overarching research question for this thesis, that implies both a diagnostic and a transformative attitude. The large scope of this interrogation is clarified by the following three sub research questions, which operate unitedly through a combination of landscape research and design methods. The main ambition of this thesis lies therefore in presenting a methodology as a response to the following question:

- How can the floodplain landscapes of the Meuse be revealed and transformed towards an attunement to the river's intrinsic rhythm?



The extinction of representative fish species from the Meuse river is linked to human pressures: atlantic salmon, allis shad, sturgeon, sea lamprey, houting, river lamprey, flounder, twaite shad. Source: Wikimedia Commons.



Belgian school class on excursion along a dry Meuse, in summer 2022. Photo: Empreintes.Be

Sub research question 1

In order to revisit existing relations between the dwellers of the Meuse and its intrinsic time, an attempt at critically revealing the current state of human occupation of the river space is necessary. With its international floodplain as a terrain of inquiry, the first engagement of this thesis is ordering and representing intensive human uses in (dis)attunement with the temporality and rhythmicity of the river cycle.

- Can global human uses in the Meuse river floodplain be represented as part of the river's rhythmic cycle?

Sub research question 2

In the context of growing scholarships that offer alternative river readings in the Anthropocene, works that analyze the Meuse landscape as a plurality of more-than-human entities are absent.

However, perspectives on heritage that entail and go beyond cultural relations in river landscapes could provide an initial framework for this type of research.

Collecting river stories through the on-site method of the transect, before illustrating them through the Illustrative Method particular to the Lab in which this research takes place, in the second chapter I document and illustrate traces of local practices along the Meuse. The objective is to reveal landscape knowledges that encompass non-human actors in the cultural riverscape, to be referenced as values in the design task. In order to do so, I chose to examine a stretch of the Meuse floodplain on which industrial and extractive pressures are less present than in the rest of the river. As it is explained at the end of the first chapter, this is the upstream part of its course, under French administration.

- Can (traces of) practices that rely on more-than-human, seasonal relations, be found along the French Meuse?

Design assignment

A transformation of the Meuse landscapes must start from positioning in specific sections of its floodplain, to experiment with a spatial planning methodology that contrasts with the commonly employed global framing of this river. The selection of a case study for a speculative evolution of the Meuse landscapes is therefore informed by an analysis of the international floodplain in chapter 1.

Positioning the landscape project in a particular stretch of the river is crucial here to formulate a specific spatial transformation drawing from the local context. This is made possible by a deeper understanding of the locar dwellers, the history of past relations to the water that are still at play, and the possibility to work with a site-specific river rhythm. The goal of the design is not strictly a technical resolution of spatial problems of the river and its floodplain, but a larger speculation about a next phase in the ongoing and intrinsically unstable cultural relation to the Meuse.

Encouraging new ways of relating to the river and its floodplain landscape through a set of seasonal riverine practices is the main ambition of this assignment. This encompasses an active involvement of locals in the co-realisation of the riverine space.

The format of the landscape design is a territorial landscape plan, focused on the phased process of its participated realisation. It starts with an activation phase in which punctual actions turn the territory into a "living laboratory". Located in Sedan, in the Ardennes region of France, it departs from the following question:

- How can a floodplain atelier in Sedan, France, serve as a landscape laboratory for new practices and relations in attunement with the time of the Meuse river?

The applicability of the floodplain atelier design process in other sections of the river is discussed in the conclusion of the report.

4. Methodology

Research & Design

The landscape architecture (graduation) project methodology developed in Delft is rooted in the paradigm of research through design (RTD)[28]. In most applications of this paradigm, the projects follow a *post-positivist* worldview, addressing quantitatively assessable, functional research questions, "solved" by design strategies or complete designs that although often generalistic, can be extended to other similar cases.

Although stemming from this methodological tradition, well imprinted in the curriculum in which this thesis takes place, the research questions of this project tend towards another variation on RTD, what Lenzholzer calls the "*constructivist*" one[29]. Within this framework the produced knowledge is qualitative and focuses on the development of new constructs and values. Theories, interpretations, concepts, or cultural critiques inform proposals for new landscape designs. Unlike positivist knowledge, which is generalizable, this knowledge is intricately tied to the specific contexts of physical and social environments[29].

The *constructivist* framework forms the base of this thesis methodology, in which the design process stems from a qualitative problematisation (although informed by quantitative data) and investigation of the Meuse territory.

The first two chapters focus respectively on revealing why it is needed to humanly inhabit the space of the river differently in the present time, and how this was done in the past. They form progressive steps towards the choice of a right space in the vast territory of the Meuse in which to position the design assignment, and inform its values.

RTD (Research through Design)	***Post-positivist***	***Constructivist***
Kind of design knowledge	"objective", generalizable, quantitative, strategic	contextual, transferable, qualitative, procedural
Addressed issue by R. Question	physical/functional	social, morphological, aesthetical
Methods	Design hypothesis testing / Design experiments tested with surveys, simulations or measurements / Strict protocol	'Creative' reflection in action / Personal involvement / Question driven design process / Thick description / Intense designer involvement-immersion / Systematic 'reflexive journal'
Evaluation criteria	'objective' validity, reliability, generalizability	originality, dependability, transparency, credibility, effect on perception, shift in values

RTD (Research through Design) methodological frameworks, adapted from Lenzholzer, 2018[24]. This research uses the constructivist one.

Methods per chapter

1. Inhabiting an international floodplain

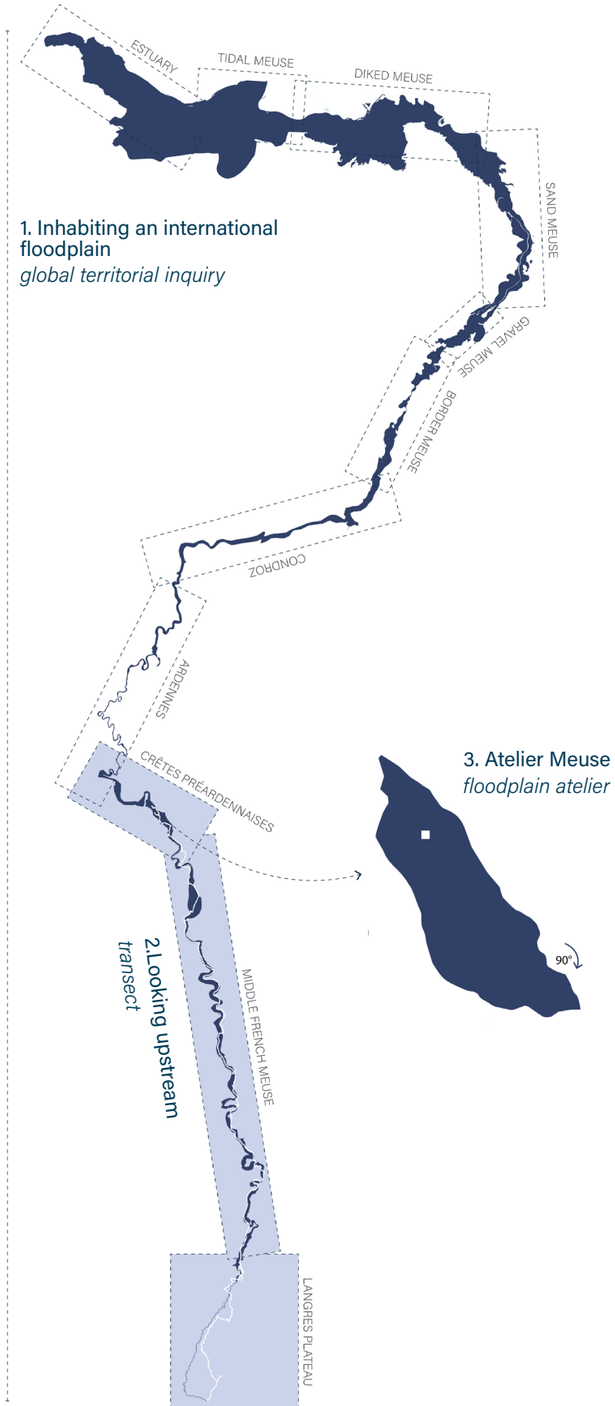
A smaller scale than the watershed, yet vast for its international complexity and surface, is tightly related to the river line and its changing width: the floodplain. Sizing around 2000km3, a similar measure to the surface of Luxembourg, this bioregion is the terrain of a global introductory inquiry in the first chapter.

A review of hydrological data is the start to this large-scale examination of the Meuse. Following on recent interdisciplinary and landscape architecture writings on the notion of water rhythmicity and its representation through spatial calendars[30,31], I employ literature review and mapping (of time) as revelatory tools for the human uses in the dynamic floodplain space. In this chapter I choose to address the large- scale, human, functional dimension of the river, that informs its planning and management. To order the human uses of the river water, different literature sources are combined to trace a genealogy of their impact on the river landscape.

After that, thematic and synthetic cartographies are employed, next to a rendering of the uses in a *spatial river calendar* (next page), to reveal a human (dis)attunement to the discharge rhytmicity of the

2. Looking upstream

The second chapter presents a transect as an on-site research method[32], tested to gather situated knowledge about practices entangled with the non-human life of the river. Conducted through the most upstream stretches of the river in France, I set out to collect qualitative data (photographs, drawings and annotations) to respond to this task. Once back to desktop analysis, these local practices have been represented using the *Illustrative Method* specific to the lab in which this research takes place[34]. Editing, classifying, redrawing and mapping the local water systems allows here to highlight current or past practices related to the time of the river.



Scales

The scale complexity of studying a river like the Meuse lies in the far-reaching implications of its hydrological cycle. Studying the dwelling of the landscapes of its watershed, all influencing the quantity and quality of the river water, would outreach the concise extent of this thesis project. Smaller scales were therefore employed in this thesis to touch on different aspects of the main research question. Throughout the three chapters, each responding to a part of it, different geographical frames of the same river are employed, progressively scaling down the terrain and positioning within the floodplain of the Meuse (white).

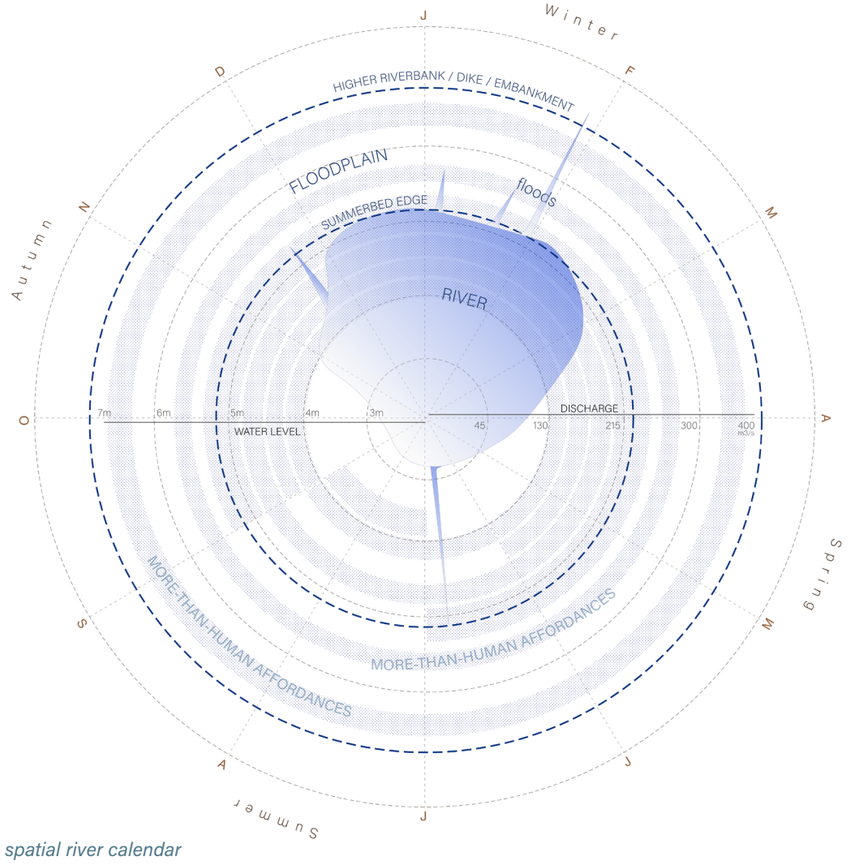
3. Atelier Meuse

The design location, framed as an intercommunal stretch of the Meuse floodplain, undergoes a specific site-analysis combining on-site interviews and observations (through a fieldtrip journal[33]), a morphological study through GIS mapping, and an historical overview based on literature and archival materials. The fieldtrip journal can be found in the annex to this report.

This combination of methods highlights a threefold design problematique from which to propose a spatial adaptation of the territory of Sedan, between urban and rural design solutions. With the strong belief that landscape transformation can be seen as a transversal subject[34], shared by different (also non-human) actors, I propose to frame this local river transformation as a fictitious, cooperative *floodplain atelier*. This process will be motivated and explained with the help of a precedent study in the inherent chapter.

As a *"Working group constituted for the purpose of a collective activity"*[35], the atelier becomes a laboratory for a local and possible transferable floodplain transformation methodology, reinventing ways of dwelling with the river time.

In this light, I propose a territorial plan as the spatialisation of a flexible design calendar. In both the calendar and the plan-based drawing of the territorial plan, three new values of relating to the Meuse landscapes are proposed. A time-based writing of specific spaces, as pilot projects in the local territorial plan, concludes the chapter. These are developed through drawing experiments, testing with physical models and photographic collages.



The spatial river calendar

A representation tool that comes back throughout the thesis project as a revelatory and designerly method.

Based on quantitative data from a discharge/water level hydrograph, the Calendar can incorporate different spatial affordances of the intrinsic river time: the space of the floodplain, or the strict limit formed by a dike can be noted as circles around the summer bed of the river, in which the water discharge varies on a seasonal basis.
Moreover, the tool can incorporate rings that indicate where and when life cycles, uses, or practice of/with the river water take place.
The continuity or seasonality of the rings, wheter or not in line with the discharge diagram, can synthetically reveal their attunement to the intrinsic time of the river.

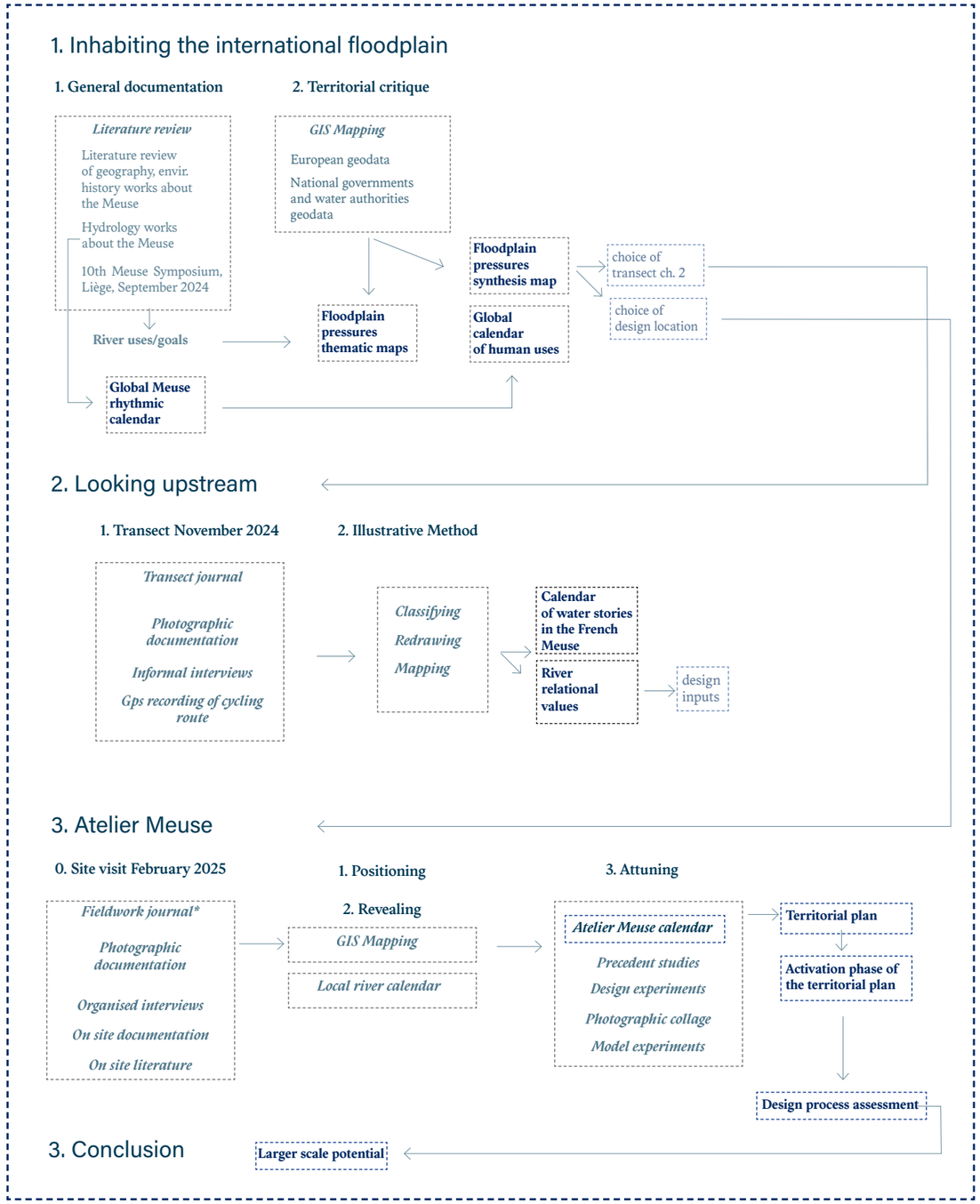


Diagram of the methods employed per chapter, putting them in relation. In bold, the outcome of each chapter.

*The Fieldowork journal can be found in the annex to the report.

Theoretical framework

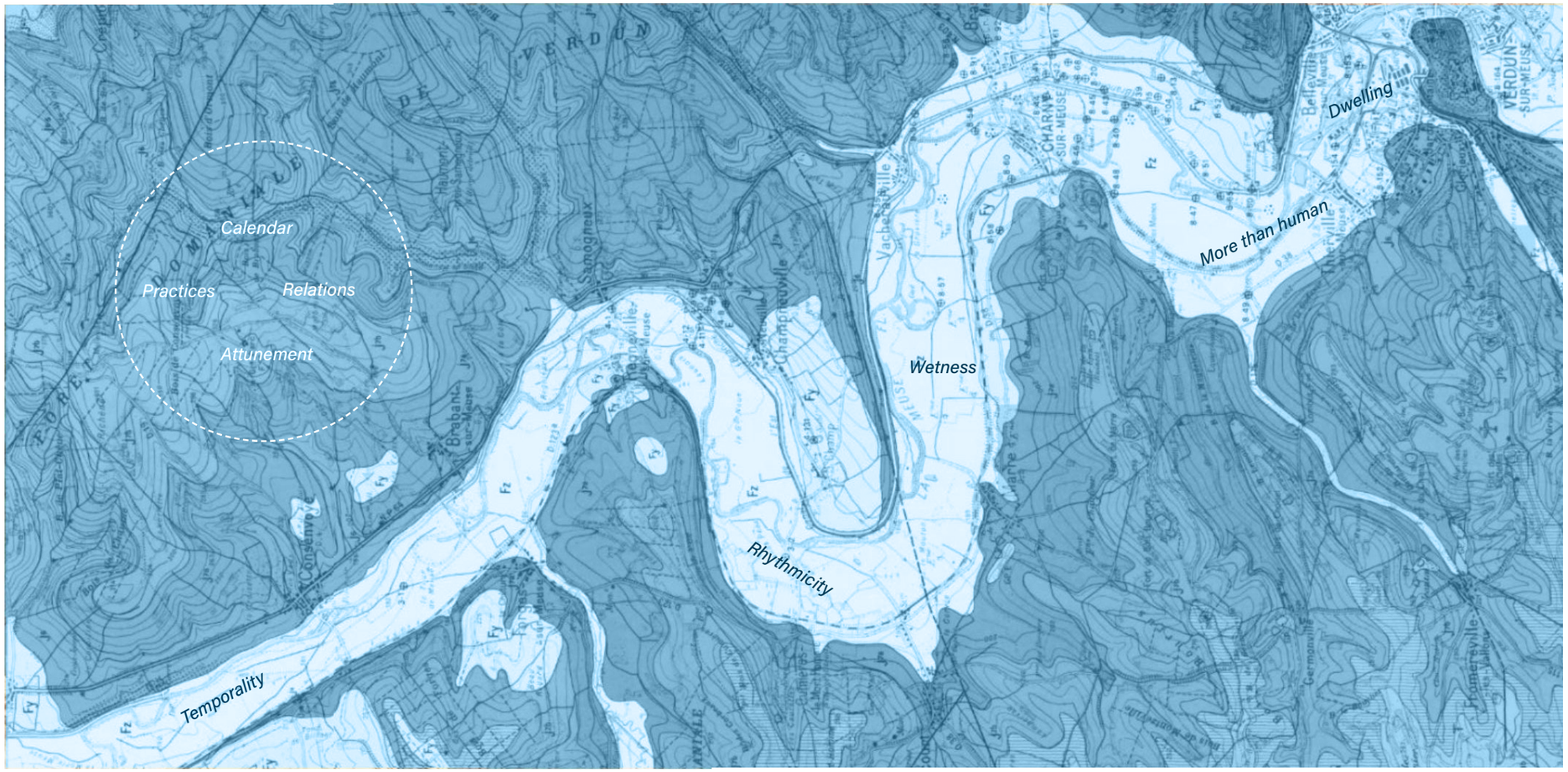
Floodplain wetness

A river is by definition an unstable spatial condition, ideally "migrating" in the space of its own floodplain by means of erosion and deposition of sediments, in a constant evolution through time. Even when linearily stabilised by adaptations, the temporality of the river flow still expresses in the variations of water level, covering the areas alongside the main bed through what landscape architects Da Cunha and Matur call degrees of wetness[36]. These two basic spatial characteristic of river landscapes, the mutation through linear time and the cycles of rising and falling waters, can be situated in a broader academic tradition on the temporality of landscapes.

Landscape temporality

A temporal character is common to all landscapes. It is readable in the layered traces that exist upon their more or less stable geological foundations. This palimpsest therefore acts as a metaphor, as an established lens of the landscape discipline that refers to the chronological superposition of the different modifications of the same environment. Put otherwise, such temporal palimpsest can be understood as an archaelogical complexity embedded in the composition of most landscapes, including the river one.

According to anthropologist Tim Ingold, who extensively explored the spatialisation of time linearity , the evolution of landscapes also implies a cyclical aspect. A land is in fact marked by seasonal patterns of dwelling activities, which adapt to the locally specific and mutable climatic conditions[37]. These dwelling activities, for instance human agriculture or non-human breeding, contribute to mark a cyclical structure in the linear time of that place[37]. Subject of a constant evolution, the landscape is therefore not only *in becoming*[38], it is also defined by a particular rhythmic cycle, unique to the relation between the inorganic processes playing out and the moments in the life of the beings inhabiting the landscape.



River rhythmicity

Rhythm recently became an emerging research topic in river studies within environmental humanities, drawing from the previously cited scholarship in anthropology. Jackson et al., important authors in this field, define river rhythmicity as the periodic, recurrent phenomena of riverscapes shaped by the rise and fall of water levels, forming regimes of river time[30]. Nowadays easily measurable through hydrographs of discharge quantities, these rhythms structure the lives of river-dwelling human communities, but also the behaviors of non-human beings, such as fish species that depend on specific flood conditions, or riparian vegetation synchronized with inundation cycles. These authors emphasize in this sense the relational values that lie in this shared cycle, including not only human practices with the flowing water, but also relationships that cross interspecies boundaries. In the indigenous communities they cite, these relations are grounded in care, reciprocity, and responsibility. When rhythms are disrupted by hydropower infrastructures or other alterations of the flow regimes, these relationships are weakened or severed. Krause [38] proposes understanding the land-water successions in rivers through spatiotemporal rhythms of wetness, mud, and sediment, rather than through fixed spatial categories or hybrid models. In his ethnographic cases, both humans and non-humans are shown to participate in and be affected by these spatial alterations: fish reproduction, vegetation cycles, and muddy shorelines all respond to fluctuating water levels driven by both climate and infrastructural adaptations. Krause emphasizes how materialities such as dams, floodgates and tree roots interact with human practices, producing landscapes that are never static but continually coming into being. Similarly to Jackson et. al., the examined cases highlight the rhythmic co-constitution of environments through both human and non-human engagements.

Spatial water calendar

Bobbink et al.[33] incorporate the notion of rhythmicity in the review of two graduation projects representing a year in the cycle of a waterscape (in their research it's the deltaic condition) through the spatial water calendar method. This calendar visualizes fluctuations in water levels, salinity, and wetness, which affect both human livelihoods and non-human processes like agricultural cycles, aquatic ecosystems, and salt-freshwater dynamics. By grounding design in concepts like hydro-sociality, rhythm, and volatility, the projects employ the calendars to reflect on how landscape transformations are driven by the interactions of people, water, and ecological systems over time.

As a tool that enables landscape design to be responsive to changing conditions, rather than relying on fixed spatial plans, the authors conclude that spatial water calendars requires further research[27].

Attunement

A precarious synchronisation with the river rhythm, lying at the heart of this research project, can be reached for humans only through the unmeasureable action of *attunement.*
Defined as "the action of being able to understand or recognise something", this word has a philosophical use, indicating a relational disposition towards the world, and includes practices close to the time of the landscape.
Following Erin Manning[39]:

The lumberjacks in northern Quebec live in a subsistence economy that is largely extractive.

And yet, theirs is an attunement much more refined than mine when it comes to what needs to be left standing and what is in the way of the forest's ability to thrive.

4. Methodology

Landscape choreography

Temporality is increasingly becoming a fundamental structuring element in landscape design. Every practicioner in the discipline is aware that landscapes are continually enacted, shaped by cycles of human maintenance, seasonal changes, or shaping by animals like grazers. When adopting time in such performative way, it means that a landscape does not change once (like with the contruction of a building), but *becomes* through repetitions and variables, like mowing, pruning, or flooding. Thus framed, the landscape is a site of ongoing negotiation, a stage on which both ecological dynamics and social practices are performed.

In their latest article, Knox and Holmes introduce choreography as a conceptual lens through which to understand and evolve landscape design practice[40], drawing on performance studies to reframe the traditional role of the designer, detached from the processes of making planned compositions. Inviting designers to engage with gardeners, local communities, ecologists, and other stakeholders who interact with the site over time, they describe cases where the landscape design process resembles a rehearsal more than a composition. In the Parc de Sausset, for example, the Corajoud couple initiated a long co-design process with local forest managers and farmers to gradually transform crop land into a park.

Although needing further research to give strong methodological guide to landscapers, the authors claim that this choreographical approach is suited to "make" landscapes at a larger scale than the usual contracted projects in the profession (squares, parks, etc.).

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1. Inhabiting an international floodplain

- Can global human uses in the Meuse river floodplain be represented as part of its rhythmic water cycle?

1. Ryhtms

The time of the river

The time of a river is marked by the unstable and unpredictable displacement of its waters; yet in the succession of years, recurring seasons of rising and falling of water create recognisable conditions for life to go with this rhythm. What hydrologists call a “flow regime”, is the basic variable for a river, and can be studied to interpret the socio-ecological dynamics[1] that unfold in this landscape type.

For riverine non-human life, even more than for human dynamics, the succession of moments of flood and drought, humid and dry, is the core of life cycles. We could say that the Meuse behaviour is intrinsically embodied in how species as the pike, the stork, the beaver organise their dwelling of this space. The breeding, laying of eggs, storing of food follow the “will” of the river[2]. But what can be said for the sapiens, organiser-species able to shape the Meuse time itself by altering its rhythms through physical interventions and greater atmosphere alterations?

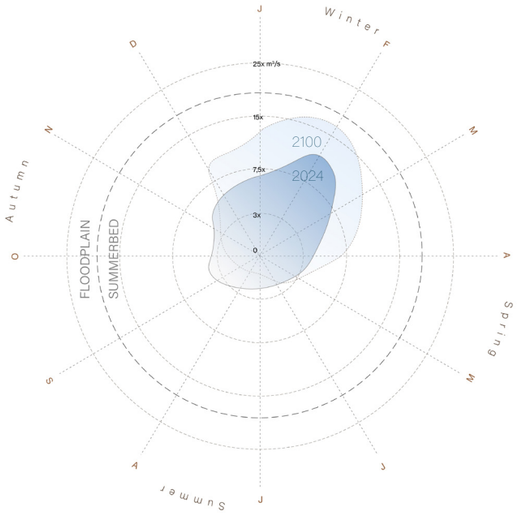
Times of flood and drought

The Meuse is a rainfed river[3], shedding seasonal precipitations that fall in its basin following recognisable (yet changing) patterns. As we can see on three locations along its course (opposite page), the discharge of rainwater peaks during winter months, diminishing gradually towards the drier summers, before increasing again suddenly from October. The typical *spatial river calendar* of the Meuse (under) is not only marked by the hydrological winter and the hydrological summer, corresponding to the four biological seasons in north-western Europe: peak moments of flood, and increasingly recurrent droughts punctuate life cycles around the Meuse. A third factor indicating time (on the longer run) are the “memorable “extremes” - historical floods that, more than to non-human life, mark cultures and generations of water managers.

Recent researches on the hydrologic behaviour of the Meuse and its modelling in future conditions warn for an evolution of the water calendar, towards more and more extreme differences between summer and winter months in 2100[4]. The last notable large flood of the Meuse, in July 2021, already showed the consequences of concentrated precipitations in a period of drought, during which the soil cannot absorb the exceeding water.

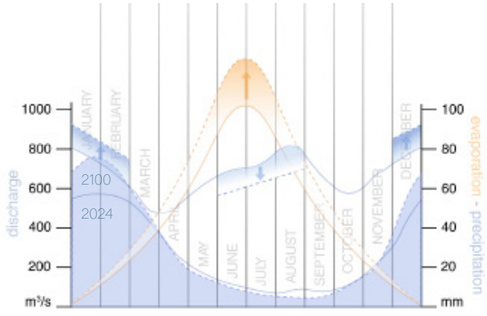
In the past, evolution of the flow regime of the Meuse were ascribed exclusively to the changes in land use inside its catchment, like the shift from moisture-storing forested areas to agricultural land[3]. The recent calendar shifts however overcome these modifications, and are henceforth attributed to changing precipitation patterns as a consequence of humanly induced climate change[4]. Addressing the cause of these climatic shifts, cannot in terms of competence, scope and complexity fall within the scope of this research. However, the spatial pressures on the physical manifestation of the river’s rhythmicity, i.e. the space of its floodplain, are promising to study as a time-related landscape phenomenon.

As we will see next, the floodplain has been subject to impactful human adaptations since a long time in the river’s history.



Global Meuse rhythmic calendar

The rhythmic, seasonal flow calendar of the Meuse set to become more extreme towards 2100 because of climate change.
In the winter months, the discharge will become on average 8 times the one of the summer. Data: Boutnik et. al., 2023.[4]



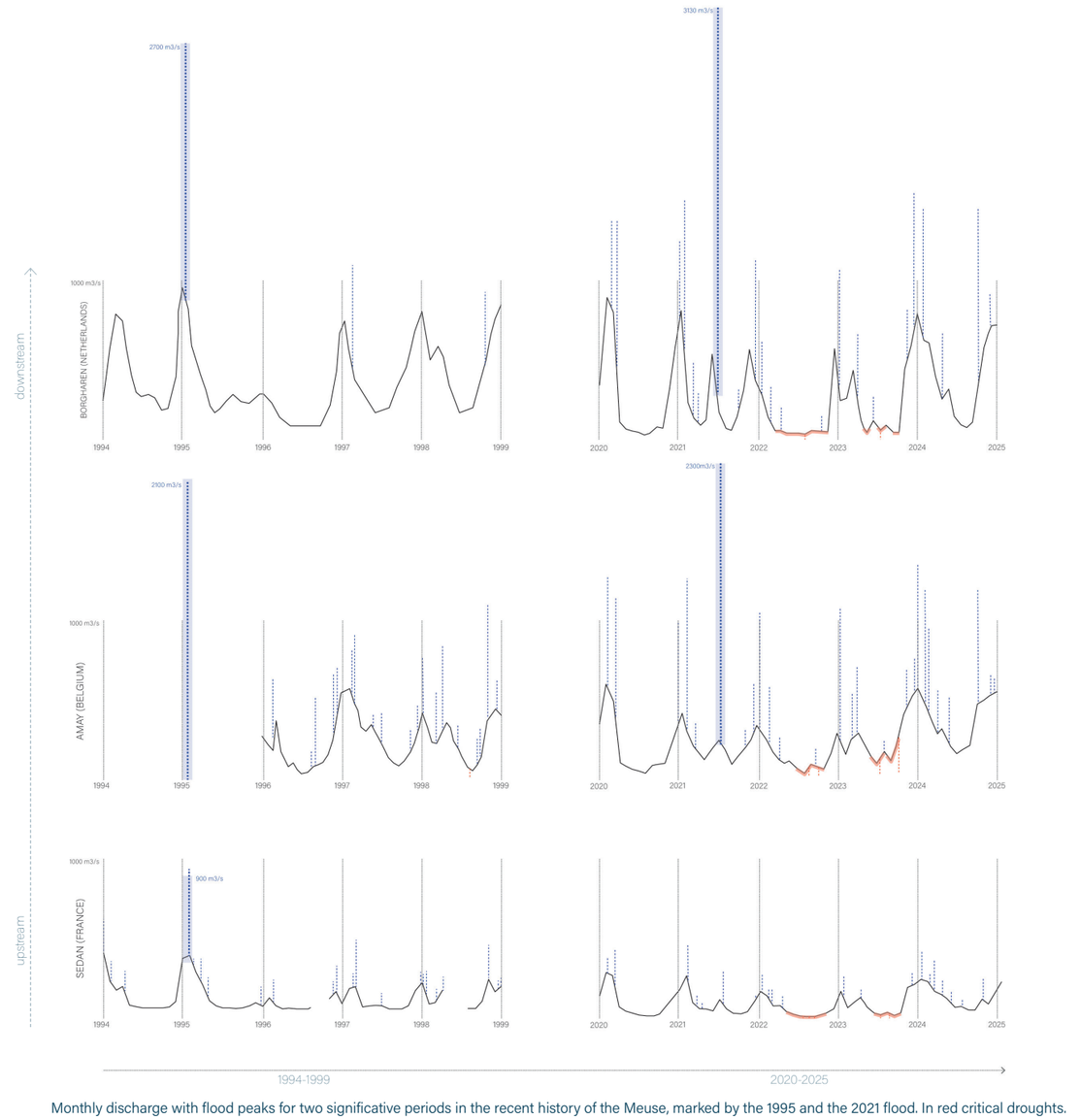
Meuse average yearly discharge at Borgharen (NL). Higher summer evaporation and more precipitation in the winter will amplify the extremes in the discharge calendar towards 2100. Data: Boutnik et. al., 2023. [4]



Summer flood in Limburg, July 2021. Photo: TU Delft.

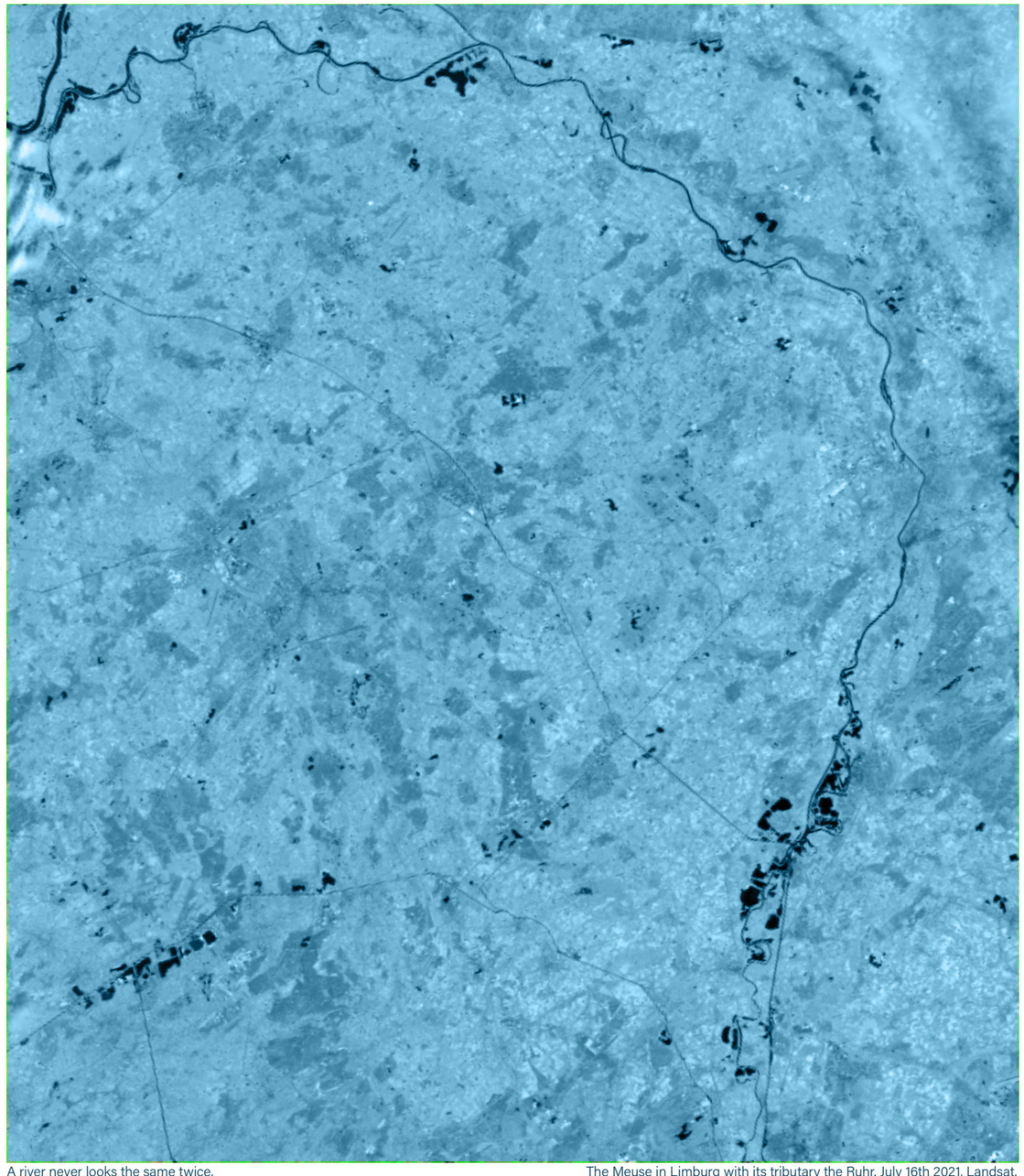


A totally dry Meuse in Belgium. Now happening artificially once every 5 years for dredging, this could be a recuring picture in the near future. Photo: Eric Cornu.



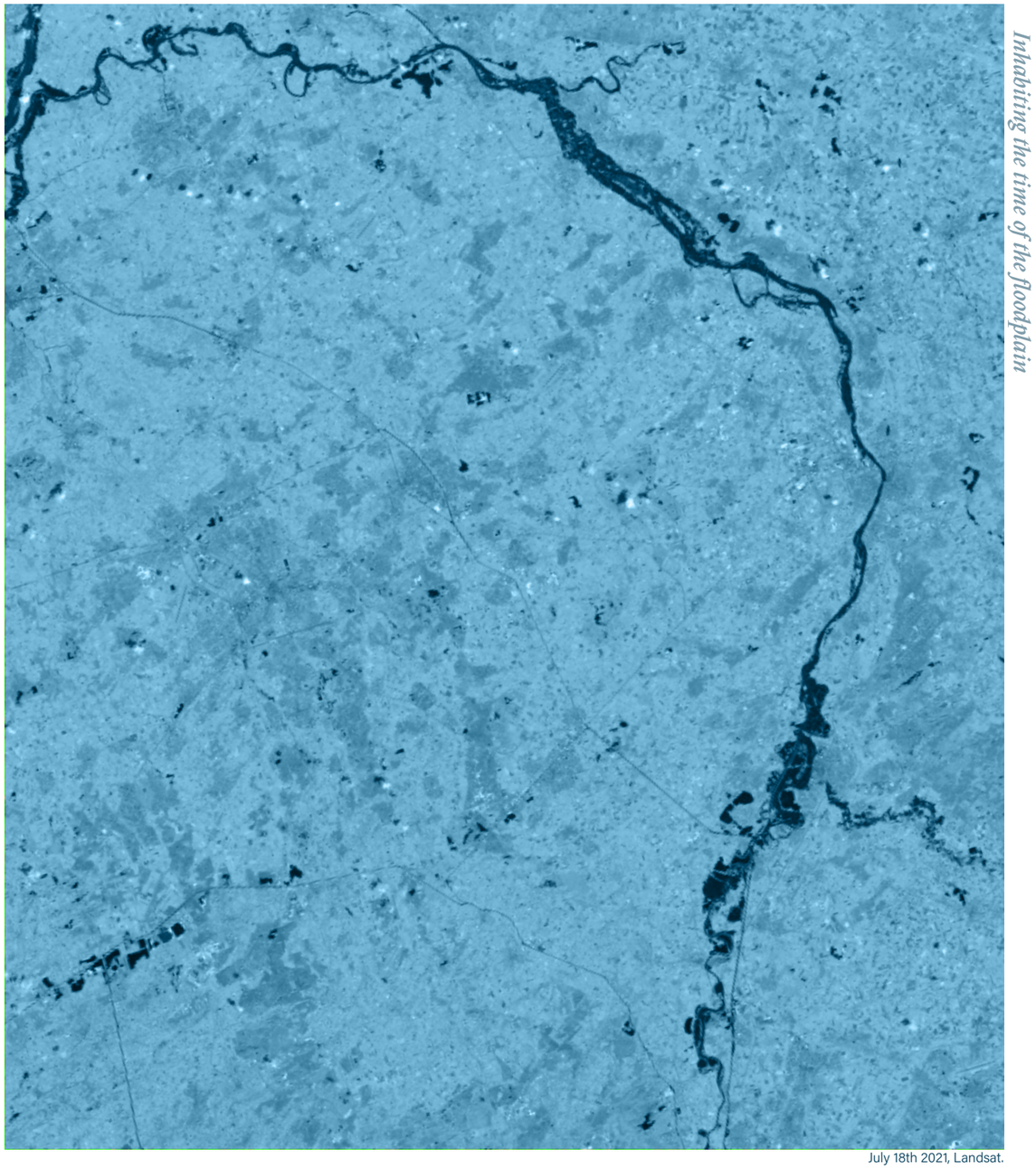
Monthly discharge with flood peaks for two significative periods in the recent history of the Meuse, marked by the 1995 and the 2021 flood. In red critical droughts.

Data: Rijkswaterstaat, Hydrometrie Wallonie, Hydroportail



A river never looks the same twice.
This sentence could not have not been more tangible than in july 2021, when 275 mm of rain falling over 48 hours in the Ardennes and Eiffel triggered severe floodings of the Meuse and its tributaries.
These caused widespread damage and loss of 200 human lives in urban areas built in the floodplain of the river.

The Meuse in Limburg with its tributary the Ruhr. July 16th 2021, Landsat.



July 18th 2021, Landsat.

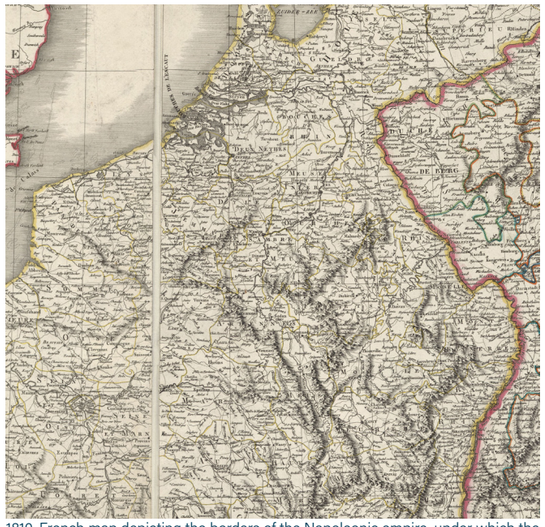
2. Evolution

Pre-industrial adaptations

Hydraulic and geological processes are far from the only agents that shaped the Meuse to what we currently perceive. Very early anthropogenic modification of the river course and its sediment balance date back to as early as the first decades B.C., when Roman settlements became stable around its delta[5]. Effects of large scale land reclamations can however be traced starting from 1050 A.D[6]. From the 13th century, the lower sections of the Meuse in holland were embanked with dikes[6]. Short ring-dike cultural systems in the Limburg region probably also started during this century, although the precise origin is still unclear[7].

First canalisations

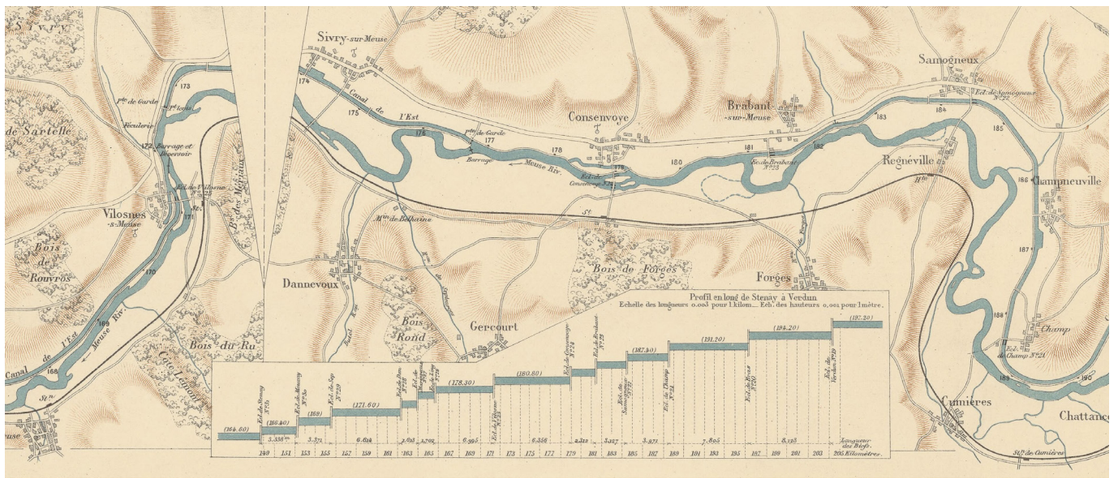
The upcome of the nation-states in the 19th century, with economical politics that increasingly promoted inland freight shipping, marked a first "canalisation era"[5] in Nort-Western Europe. In the low, sandy plains of Brabant, the first canal in the Meuse watershed was completed in 1826, the Zuid-Willems vaart. From that period on, canals in the low valleys of the Meuse tributaries were dug to shorten trade routes, and the Meuse floodplain itself decreased in width to accomodate parallel navigable routes or normalisations of its meandering course[7]. Under the spell of the first Industrial Revolution, fueled by the coal extracted in various sites transversal to the watershed, the river was deepened, normalised, and dammed[8]. As not much more than a long trading route, it was turned into a transport infrastructure and commodity[9]. Towards the end of the century, one could ship goods all year long from the estuary up to the region of Verdun in France: this was made possible through the total of 89 dams and locks that still regulate the water level of the river course (bottom), the largest number of which is present in France (59).



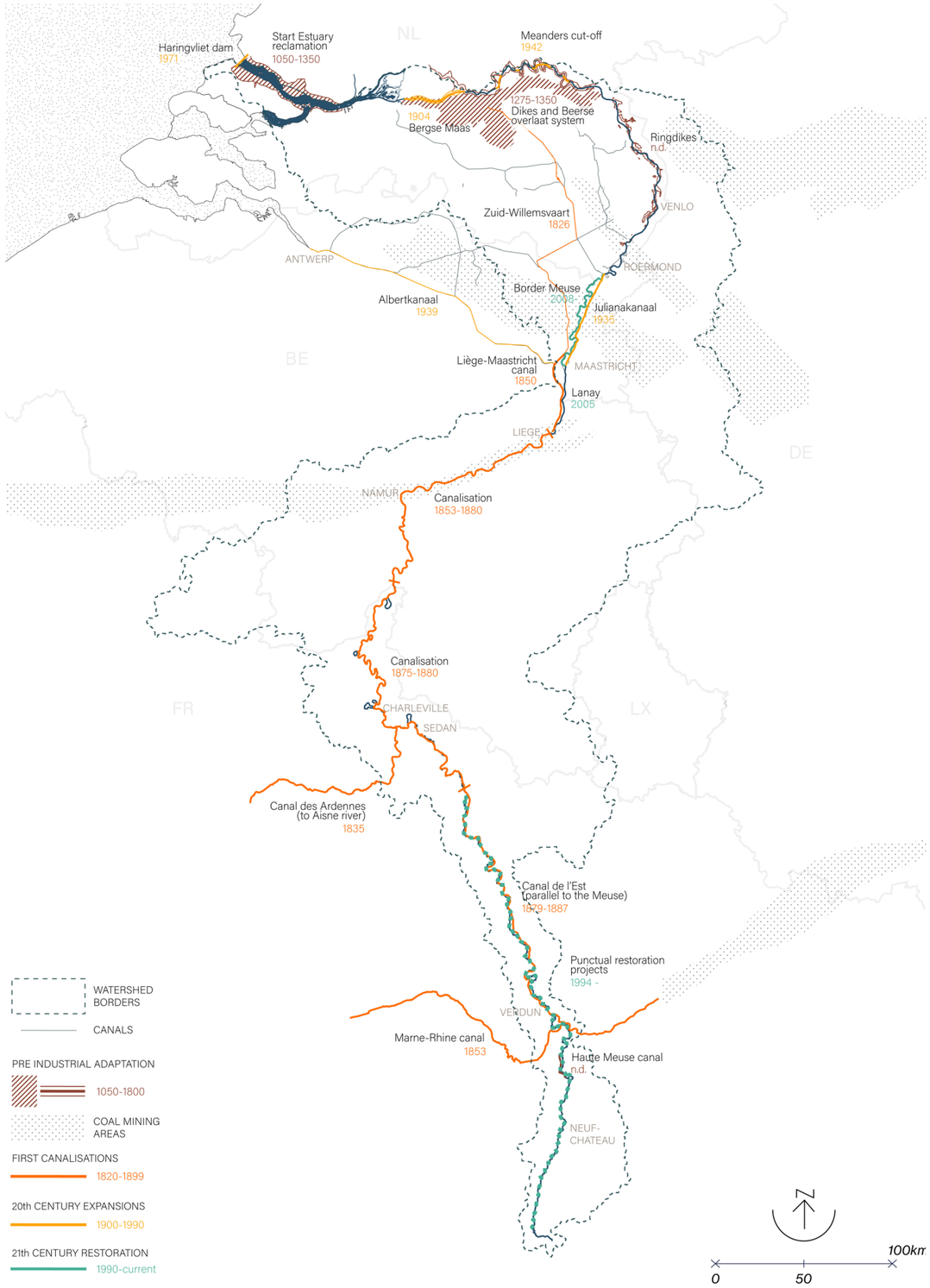
1810, French map depicting the borders of the Napoleonic empire, under which the entire Meuse watershed fell. In 1815, the Treaty of Vienna tasked riverside inhabitants with the responsibility of controlling the river flow to facilitate international trade through navigation. Map by Jean Poirson, Source: BNF.

20th century expansions

In the 20th century, large scale modernisations of the "river infrastructure" were conducted mostly in the Netherlands: on the agenda was the combination of flood protection and amelioration of navigation routes. The separation from the course of the Rhine through the digging of the artificial Bergsche Maas (1904) created a separate sea outlet for the Meuse[6]. Thirty years later, the straightening of the river in the *Land van Maas en Waal* withdrew half of the area from the original geological floodplain of the dutch Meuse[9], due the abandonment of the *Beerse Overlaat* overflow system. Like other similar, smaller plains, this cultural system was landscaped since centuries as a "green river", allowing for a buffering



Plan and section of the Canal de l'Est, excavated laterally to the main river course in the narrow alluvial plain of the central part of the French Meuse. The functioning of river canals, wether parallel to the main channel or as a canalisation of it, follows everywhere the same principle. A series of compartements, or river sections is created by a system of dams and locks, regulating the flow of water in a staired system, like the one we see in the schematic section. Map by R. Vuillaume, 1890. Source: BNF.



Chronological map showing the result of human adaptations of the Meuse flow, happened during 4 time periods.
Transforming its outlet from a delta to an estuary condition, in its most downstream part, was the first extensive modification. The narrower floodplains upstream did not change from their natural dynamics before the 19th century. With the exception of the French upstream valleys, the entire river course was canalised for shipping.
In the last 20 years, we have entered a period of restoration of the "original" river appearance.



The most known enviornmental desaster in the history of the Meuse didn't happen in the water but in the air trapped in the narrow valley of its belgian section.
On december the 3d in 1930, throughout the length of the river valley a thick fog charged with metal vapours saturated the sky, killing more than 60 people by intoxication.
In that decade, the density of industrial facilities along the canalised belgian Meuse became exceptional.



1930's. Villages in Limburg are partly displaced to facilitate the construction of the Julianakanaal, a monumental infrastructure aimed at a faster transportation of coal from the active mines in the region. In the photo, the village of Eelslo, with in the background the course of the river.

outflow of high discharges behind the main river dikes. In the 1930's, two canals of 50m wide further modified the watershed: the Julianakanaal parallel to the Meuse in Limburg, and the Albertkanaal connecting the river to the city of Antwerp for navigation and water provisioning[5].

After the devastating seaflood of 1953 in the Netherlands, the estuary condition of the Meuse was adapted as part of the famous "Deltawerken". Closing off the wide tidal channel that formed the natural outlet of the Meuse to the North Sea, the Haringvliet dam was completed in 1971[6]. Shut off completely till the 2010s, this intervention played a great deal in obstructing fish migration upstream to the river[3]. Next to flood protection and waterway regulation dams, the last century saw also the construction of hydroelectric plants (a total of 8 between the Netherlands and Belgium), that further impacted the ecological continuity of the Meuse[9].

21th century restoration

Constant adaptations of the existing infrastructures, and of the riverbed itself, are continuously taken out throughout the Netherlands and Belgium[3]. This is less the case for the French sections of the river, where freight shipping declined from the 1990s[3]. Thanks to to the upbringing of a larger ecological awareness, another planning philosophy emerged at the turn of the century in these upstream parts of the Meuse[10]. Punctual riverbed renaturation projects, aimed at enhancing sedimentation dynamics and habitat diversity, were coupled with the restoration of wetlands and hydraulic annexes. Many of these interventions took place at the time of new european biodiversity regulation measures, such as the designation of Natura 2000 sites (1992-94), and the implementation of the Water Framework Directive from 2000[11]. A decade later, the Dutch and Belgian authorities followed with



Started in 2008 in Meers, the Border Meuse (Grensmaas) project can be seen as the current expression of large scale spatial planning in the Meuse floodplain. Since shipping in this section takes place on the parallel Julianakanaal, there is room for creating "new nature" by creating side channels, a wider summerbed and a diversity of wet habitats. Konik horses are one of the symbols of this style of nature development, here on the opposite bank in Grevenbicht. Photo: Bob Luijks.

large remeandering and riverbed-widening projects on the Border Meuse in Limburg. Here, for 20 years the possibility had been studied to plan stretches of the river towards ecological concerns, in combination with sediment extraction, recreation and flood protection[10]. As researchers from Wageningen recently studied[12], the Border Meuse series of projects was made possible by a public-private deal around the large availability of costly gravel sediments. The extraction of the latter "financed" not only habitat restoration goals, but also the plea of dutch state hydrologists for more capacity in the floodplain, to accomodate floods like those that occured in 1993 and 1995.

More recent restoration programs continue to be developed in the Dutch Meuse, notably the *Maaswerken* and *Ruimte voor de Rivier* (Room for the River)[3].

Restoring the heavily modified floodplain of the Meuse comes however with significant challenges. Centuries of industrial activity have left a legacy of deeply embedded sediment pollution, with high concentrations of heavy metals such as cadmium and zinc. Additionally, spatial limitations present a structural constraint: nearly 10 percent of the Meuse's floodplain is now urbanized[3], severely limiting the available room for habitat succession dynamics to unfold.

3. Pressures

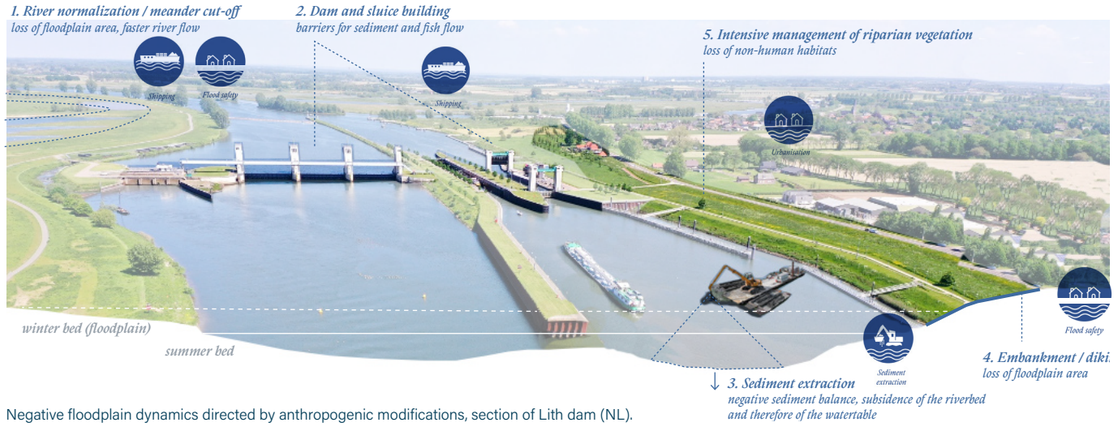
Few rivers have been heavily modified as the Meuse, and are used for as many goals[3].

The most impactful adaptations for the the river morphology are those that were and continue to be induced by the expansion of inland shipping. Together with flood-safety measures, these two uses demand the construction of infrastructures like dike and dams, physical limits to the river space (below). Other large-scale uses of the Meuse however also have a great impact on the river quantity and quality, and mutually affect each other.

While an hydrologist would describe the material benefits of the Meuse water as a free resource to be exploited for drinkwater production, energy, shipping, recreation and agriculture[3], the consequences of these activities put different degrees of pressure on the river system. Starting from the uses that don't affect quantitatively the river balance, follows a description of river uses based on the amount of water they consume.



Ten categories of water uses producing spatial adaptations to the Meuse, as emerged from literature. A number of them participates in the overall water balance of the river (following pages).



Negative floodplain dynamics directed by anthropogenic modifications, section of Lith dam (NL).

Conservation of non-human species

Non-human habitats are very vulnerable to river modifications. Species adapted to seasonal fluctuations suffer when the river is fixed into a regulated channel: habitat loss, homogenisation of the flow, and poor water quality have long time threatened biodiversity in and around the Meuse[10]. Facing the extinction or endangerment of key plant and vertebrate species, recovering projects are undertaken in the Meuse valley where space is left for habitat diversification[10]. The conservation of non-human species has therefore paradoxically become one of the uses human make of the river water. During droughts, areas where habitat restoration goals have been established have to be "irrigated" by the river flow. This is the case for the Border Meuse section, for which the Flemish and Dutch government have an agreement on a minimum flow[3] of 10m3/s.

Sediment extraction

Although not directly using river water, the extraction of floodplain soils disrupts natural sediment transport processes, alters river morphology leading to the degradation of habitats critical for aquatic and riparian species[3].

Shipping

Through large-scale infrastructural projects like sluices, embankments and channel deepening (Left page), the Meuse has been extensively modified to facilitate all-year round inland shipping. The freight is mostly composed by building materials (sand), steel and chemicals[3]. While the active routes are now only downstream of Namur in Belgium, these adaptations have altered the entire river's morphology putting pressure on the river edges, the floodplain space and its sediment balance.


1. Liège agglomeration


2. Primary dikes in Ammerzoden,


3. Intensive agriculture in the Land van Maas


4. Industry area of Flemalle, Belgium


5. Chooz nuclear power plant,


6. Gravel extraction pits near


7. Dam and sluice complex in Belfeld, Netherlands




8. Freshwater intake area in Brakel,


9. Recreation area with vacationpark in Maasbommel, NL


10. "New nature" development in Grevenbicht, NL

The spatial impact of human pressures on the Meuse river can be seen at very large scales. The geometry of the bed and its floodplain tells about the modifications it underwent.

Urbanisation

Urbanisation continues to put significant pressure on the Meuse system by transforming the floodplain surface. With over 10% of the basin now built-up, surfaces that once absorbed water are increasingly sealed off, accelerating runoff and reducing natural infiltration. As a result urban areas, historically located on the edge of the floodplain for practical reasons, now face higher flood risks[3].

Recreational fruition

Recreation depends heavily on accessible and clean river environments. Activities such as canoeing, fishing, swimming, and riverside tourism take mostly place where urbanisation densities are lower, and are often planned in combination with conservation areas. Sections of the river in the Netherlands, Belgium and France host these activities, that can happen only when water quality and flow are sufficient. The pressure they exert on the river is floodplain occupation

Flood protection

The construction of dikes, parallel to river channel, is the most altering spatial adaptation for the floodplain[3]. The lateral fluctuation of the river is blocked by embankments often made out of clay, built to protect settlements or land where agriculture takes place. These landforms create the problem of constant maintenance of this artificial condition, and have to be progressively heightened as the river dynamic is altered. Floods have less space to expand in the alluvial plain, making the average water level of the river rise, while the land behind the dike lowers because of drying.

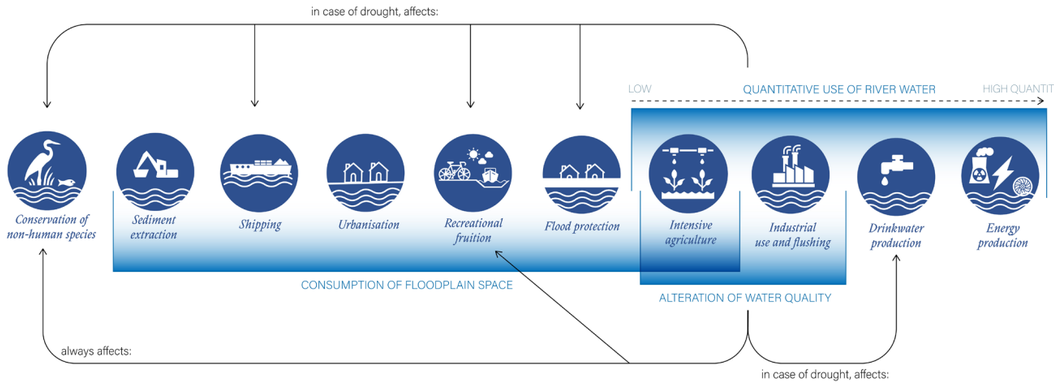
Intensive agriculture

Throughout the floodplain, intensive agriculture is a sector that consumes a relatively low quantity of surface river water, relying mostly on groundwater pumping. However, irrigated crop farming is a demanding land use that requires water when it's the least available throughout the year, in the summer months[3].

Withdrawing space from other possible floodplain biotopes, crop farming's greatest impact on the river environment is the chemical pollution of the soils and waters of the basin. Crop protectors, herbicides, nitrogen and phosphate compounds lead to deterioration and eutrophication of the river water quality[12].

Industrial use and flushing

River water is used by industries along the Meuse for their production processes. Since the permit-regulated withdrawals change every year, there is no clear data about the water quantity that these activities consume[3]. It is estimated that together with domestic uses, industries use 1km3 of river water per year[3]. Analog to agriculture, the major pressure industrial uses cause is deterioration of water quality. Not only silt on the bottom of the river accumulated the pollution of many years of uncontrolled flushing, but the water itself is still transporting aromatics compounds and other chemicals that put in danger the production of drink water[12].



Three types of pressures the ten uses cause on the river environment: consumption of floodplain space, alteration of water quality and quantity. These in turn affect some of the uses, in a system o relations that is particularly vulnerable in case of drought.

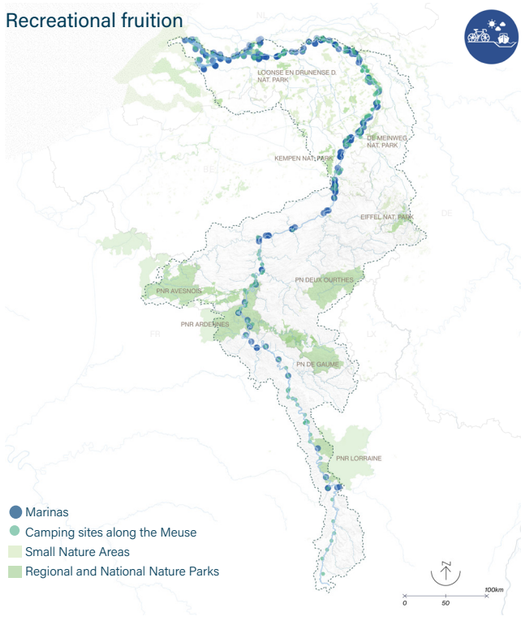
Drinkwater production

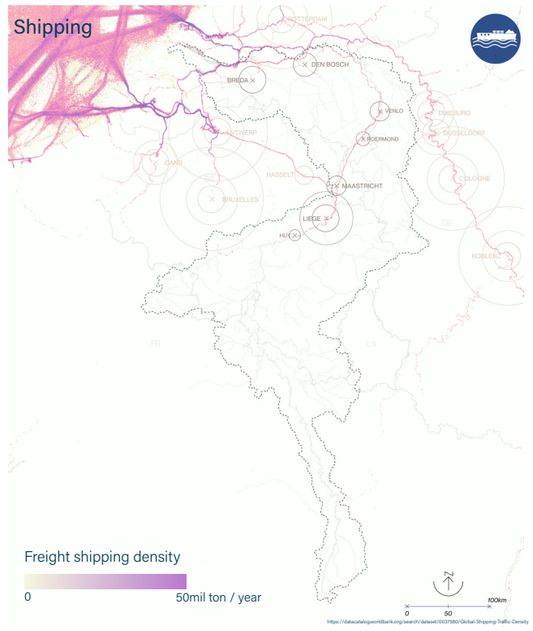
6 million people drink water from the Meuse, mostly living in coastal areas in which the extraction of local groundwater is not suitable. A large part of Vlaanderen also relies on the river for its freshwater provisioning, through the Albertkanaal that leads approximately 1/12 of the Meuse discharge outside its orographic watershed. Joint in the RIWA collaboration, five different water companies coordinate the extraction of 0,25 km3 of surface water in 9 locations, where water starts a long process of depuration[12].

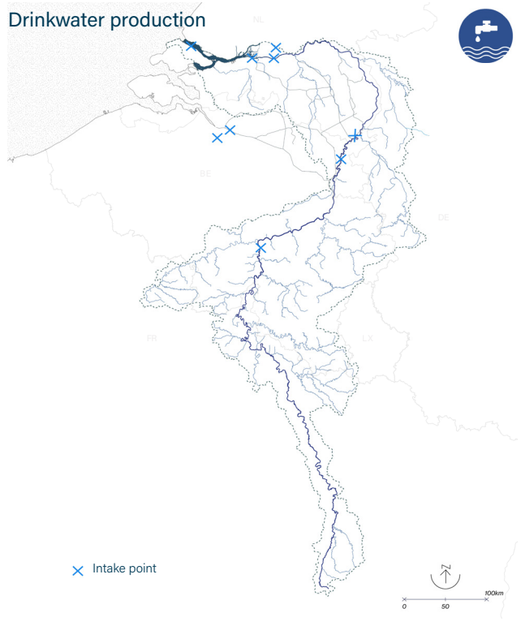
During low-flow periods, when the concentration of pollutants is higher, the intake of Meuse water can be stopped by the companies. In 2023, this happened for 120 days in the year[12], showing the need of tackling the pollution problem at the source with strict measures.

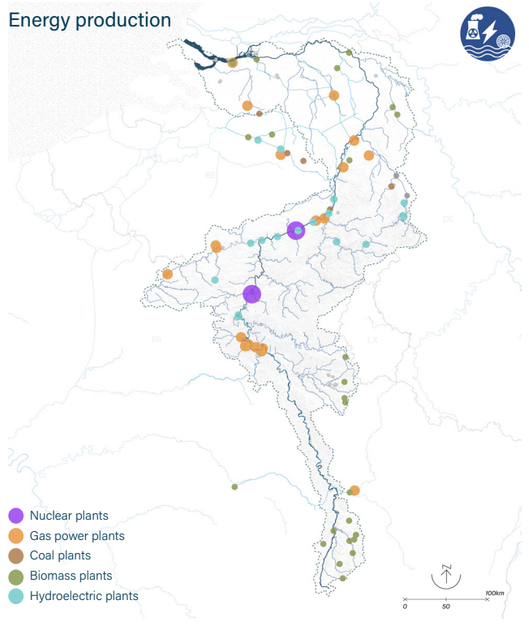
Energy production

The energy sector is the largest user of Meuse water, particularly for cooling in thermal and nuclear power plants[3]. This involves significant abstraction of river water, most of which is returned, but at higher temperatures, causing thermal pollution. Hydroelectric plants use on the other hand another quality of river water: its speed. Although their potential exists, the current total hydroelectric capacity is limited to a total of around 140 MW due to the relatively modest elevation gradient in the basin[3]. During heatwaves, climatic pressures on the river habitats can be worsened by the intermittent discharge caused by the turbines[9].









Thematic maps of fours uses on the scale of the entire river and its watershed. An higher density of points can be found downstream, where water quantity is higher, and so is also the population density. Another cluster, in relation to the recreational use and the energy production, can be found in the Ardennes , where tourism goes in hand with the presence of many nature parks.
Data: OSM, World Bank Group, RIWA, European Commission.



Works in progress for the widening of the Julianakanaal, parallel to the Meuse, to be completed in april 2025. The canal undergoes periodically adaptations of its profile, to accomodate wider and deeper ships, in order to remain a competitive shipping route. Photo: Paul van Baardwijk.

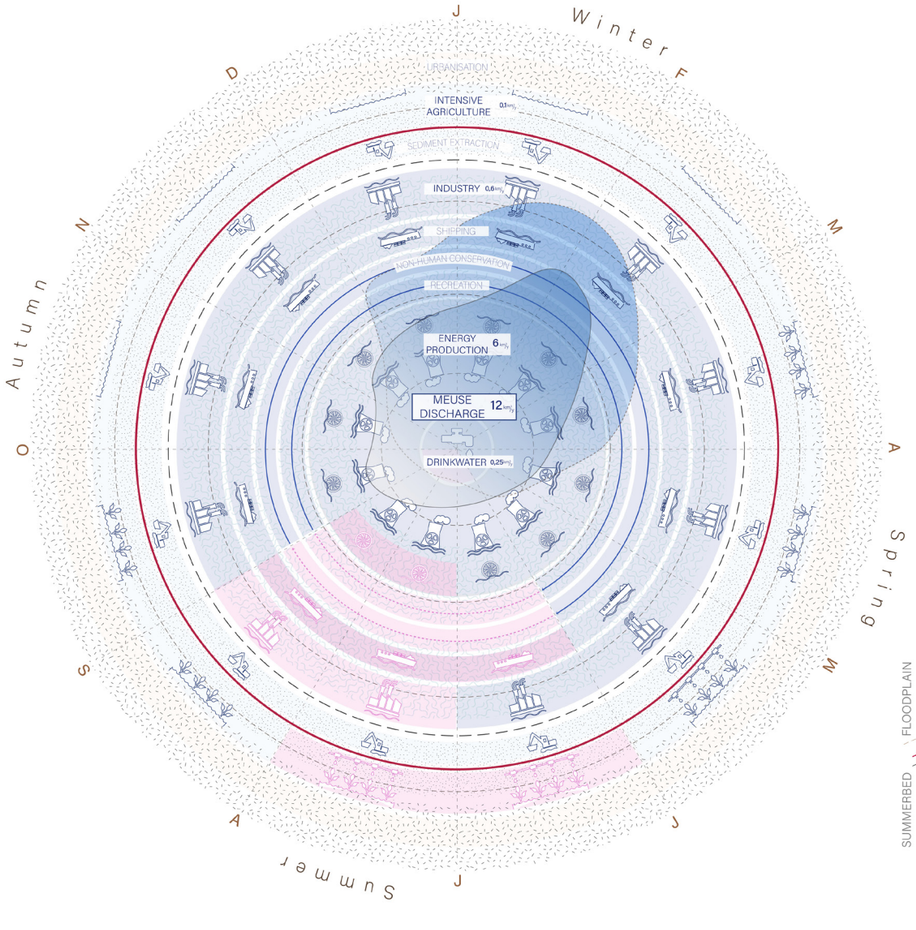
Priorities and attunement to the river

When the Meuse flow drops to critical levels, a hierarchy of different water use priorities is activated in the different countries of the basin, leading also to international agreements. In the Netherlands, a four-tiered series of priorities is applied: safeguarding dike stability comes first, followed by drinking water supply and energy production. After these, water is allocated to agriculture (mainly high-value crops) and industry[3]. Recreational and ecological functions are almost last in line, just before shipping.

France sets “crisis low flows”, that prioritize potable water and the cooling of the nuclear plants of Chooz[13]. In Wallonia, transport is prioritized on navigable waterways over other commercial uses: industrial uses are legally restricted or halted during drought[12].

In the overall balance, energy production is the most critical user of Meuse water, using half of its yearly discharge quantity to cool down nuclear, thermal and other energy plants. Although the river’s average flow is generally sufficient to meet this and all other demands, low-flow periods expose the fragility of this balance[3]. Looking at the discharge projection of the river in 2100, it is not unlikely to picture entire months during which irrigation, drinkwater extraction, shipping, and recreation could temporarily become impossible in the Meuse.

The ecological health of the river currently often falls to the bottom of the list when water is scarce. This current prioritisation of uses reflects a logic rooted in short-term human and economic stability, rather than a deeper attunement to the river’s intrinsic rhythm.



Uses of the river flow (summerbed)

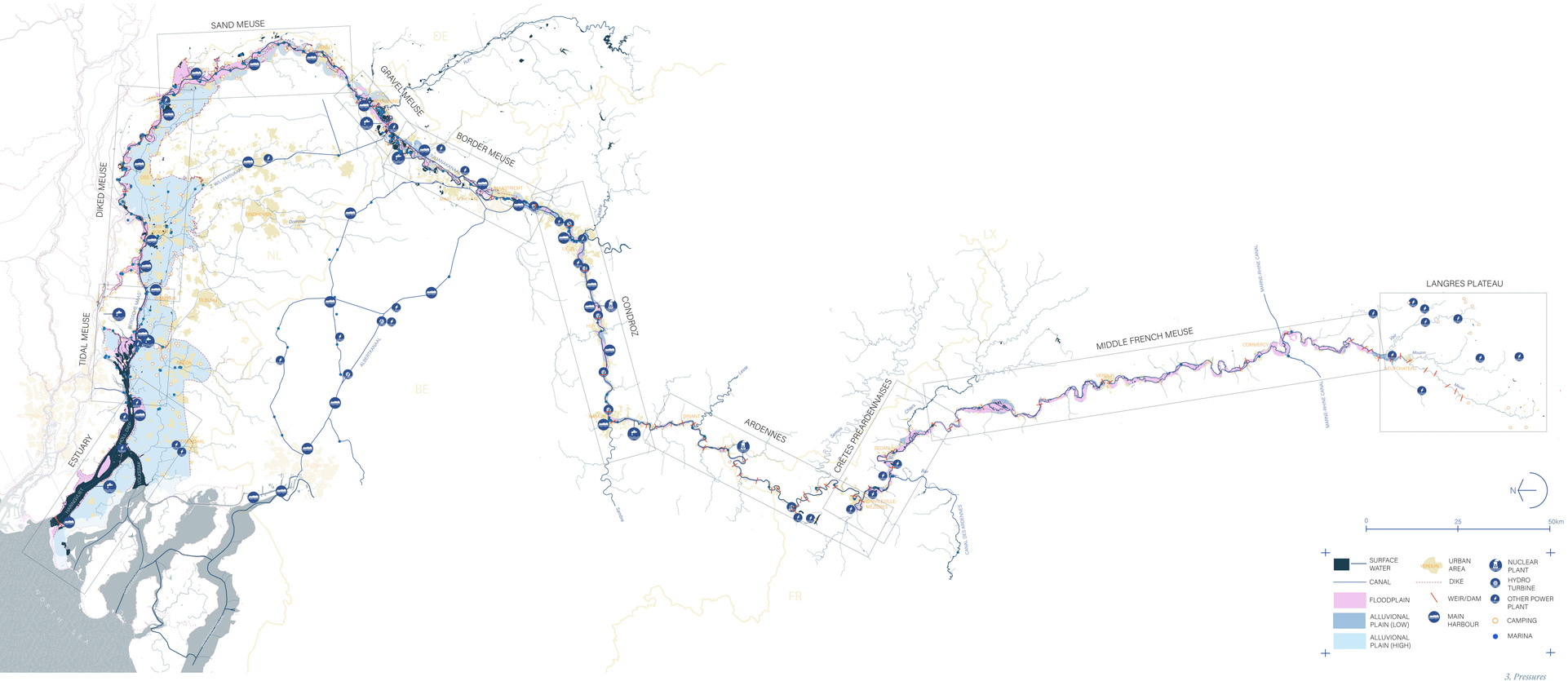
Uses of the floodplain area

Vulnerability to interruptions

Global river calendar of human uses

The prioritisation of river water uses becomes evident in case of droughts (from center to outside), when low discharge of the Meuse river can affect or harm most activities in the floodplain. These uses have longly been imposed to the river’s discharge calendar with no regard for its variable character.

Adaptations to the river flow, like its enbankment and division in dammed sections, were made and are kept in place to keep exploiting the river throughout all seasons.



Different pressure areas

This synthesis map, combining spatial indications of the uses described precedently, has to be read starting from the underlying floodplain condition.

In blue and light blue we see the extent of the alluvial plain, meaning the largest geological footprint of the river flow. When compared to the pink area -the surface that is still been flooded periodically-, we see the great shrinking of the river space caused by human adaptations. This is essentially due to the building of dikes (like the primary dikes in the Netherlands reducing the once 15km wide floodplain to a narrow canal) and the embankment of the summerbed for shipping.

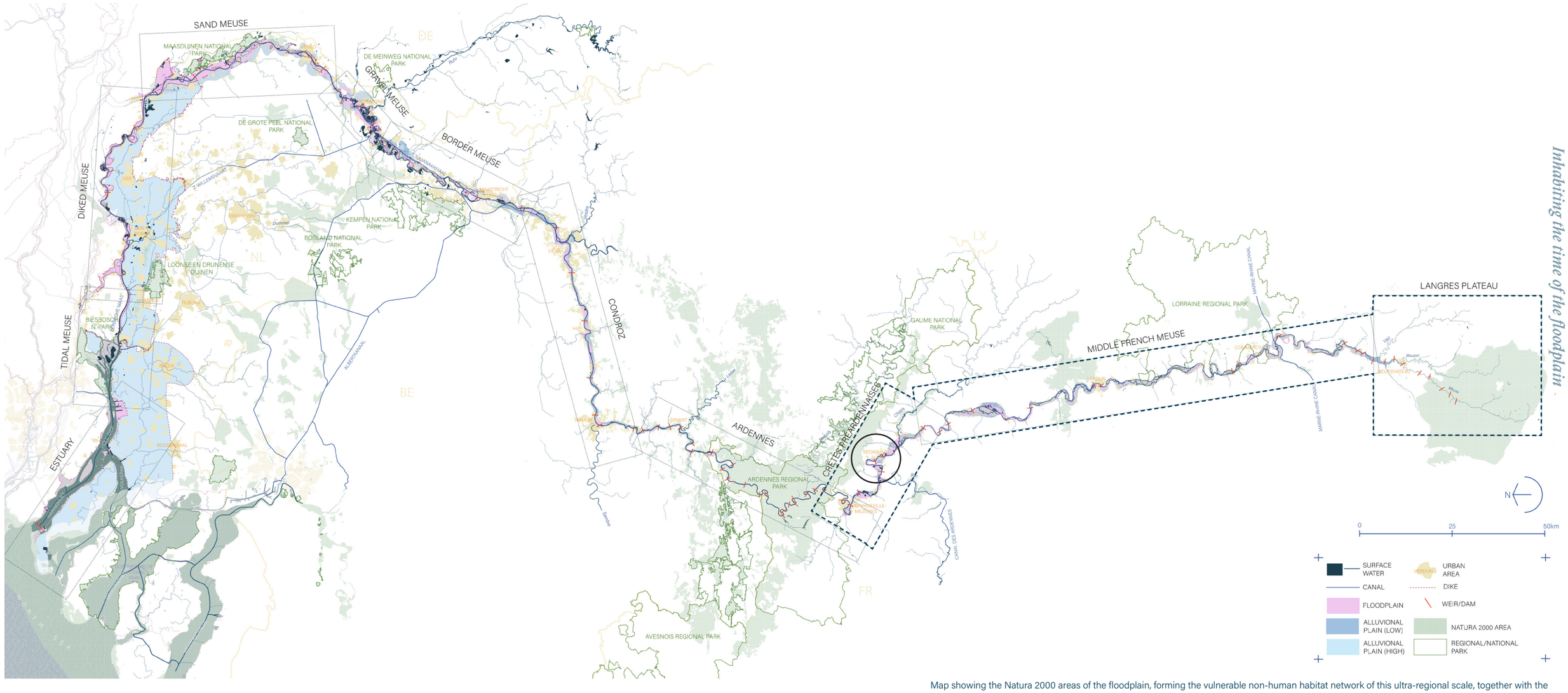
The dense urbanisation pattern in these downstream sections of the Meuse go together with the latter measures, creating an densely populated landscape in the Estuary and Tidal Meuse floodplain.

What further stands out when superposing the intake points for drinkwater production, the weirs and the ports for freight shipping, is the high density of pressures in the Gravel Meuse.

Encompassing the urban areas of Roermond and Venlo, vulnerable to floods, this is the section just downstream of the Border Meuse, where afore-mentioned recent renaturation projects are carried to enlarge the floodplain space "protecting" the downstream cities.

In the narrow valleys of the Condroz and Ardennes massive, the fast flow of water is directed to the production of energy, in the constrasting scenary of industrial and touristic valleys (see the density of camping grounds).

In the Middle French Meuse, running up to the Sedan-Charleville agglomeration in the Cretes Preardennaises, the space still taken by the meandering river almost equals the original alluvional plain. This is due to a low urban density, and absence of impacting large-scale shipping routes or energy plants, motivated by a less important average discharge of the river.



Inhabiting the time of the floodplain -

Map showing the Natura 2000 areas of the floodplain, forming the vulnerable non-human habitat network of this ultra-regional scale, together with the designated national and regional nature conservation parks. Although a system of stepping stones exists along the river, the large clusters of protected habitats are in the French part of the course, the Ardennes massive, and the estuary area.
Large nature park in the Neherlands and in Belgium include higher sandy bitopes on the edge of the floodplain.

Inhabiting an international floodplain - conclusion

- Can global human uses in the Meuse river floodplain be represented as part of its rhythmic water cycle?

Revealing the human uses of the Meuse in relation to its temporal aspect takes shape in the mapping of their spatial expression in the floodplain, superposed on the underlying geological condition of the alluvional width. The *spatial river calendar* specific to this river, showing the seasonal fluctuation in discharge, is an important complement to this map information, showing in which periods of the year the sustainability of all these human uses (often pressures) becomes unbearable. The societal ideals of shipping, producing energy, or dwelling all year round in the river valley have transformed the Meuse almost entirely into a static space, where variations in the calendar are controlled by a functional planning philosophy that constraints river fluctuations.

In the Dutch sections, a millennial history of intensive water management has converted the once wide floodplain into an indexed system of ordered canals, from which urbanisation, trade and agriculture benefit. Same can be said for the limited space of the Belgian sections of the river, where 19th century canalisations allow for shipping and energy production.

The concluding map has highlighted a contrast to these normalisations in the largest part of the French section of the river. Here the space for the river appears more generous, hypothetically allowing for floodplain dynamics that allow for sediment transporation and a diversification of riparian and floodplain habitats (see concentration of Natura 2000 areas in map above).

Such a preservation of the river space and its rhythms raises the hypothesis that in this section a higher cultural attunement to the river rhythm can be found. A lack of literature about this part of the floodplain, together with the need of researching these relations on a smaller scale, motivates a deeper on-site exploration of the French Meuse in the second chapter.

This maps also highlights the potential of the urban area of Sedan, the first after the free meandering course of the French Meuse, to be a design case study for the speculative transformation of the river. This is addressed in the third chapter of this thesis.

notes

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Looking upstream

2. Looking upstream

- Can (traces of) practices that rely on more-than-human, seasonal relations, be found along the French Meuse?

1. Transect

Inquiring the local cultural landscape

The global inquiry of the Meuse international floodplain, in the first chapter, can only give general indications about cultural relations to the intrinsic rhythm of the river. The uses that figure in it, come from categorisations made by water managers in order to be able to measure and organise the river as an infrastructure where people, goods, water, and energy are variables in the system. This machinal order constitutes however one part, or dimension, of the river reality. What about traditions and practices that emerged only in specific landscapes along the Meuse?

This questioning matured early in the research process, resulting in a cycling transect aimed at revealing the seasonal and more-than-human affordances of the cultural landscape that appear on the map as the least impacted by the global uses of the river: the upstream section of the river

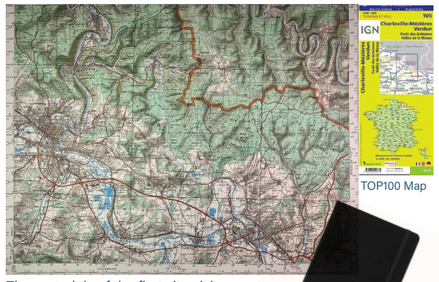
Ahead of my departure to this territory, now under French administration, I hoped to find water stories involving individuals, communities, and other beings inscribed in the time of the river. The expected outcome: a number of relational values to nourish my further research on the attunement to the rhythm of the Meuse.



Sony Alpha 6000 camera, 60mm lens



GPS recorder



TOP100 Map



The materials of the first site visit,
a landscape transect, cycling upstream
along theFrench Meuse.



My racebike equipped with bikepacking gear, in Bazoilles sur Meuse



Map of the journey, departing from my homeplace Amsterdam
and reaching the Ardennes with train transport.

Photographing, interviewing, annotating

During four days at the end of November 2024, I set out to cycle in the floodplain of the Meuse, as close as possible to the river line punctually branching out in the parallel Canal de l'Est. I stopped where needed to document, with photographies and annotations, active and lost cultural marks that I could see in this landscape. These annotations are enriched by the voices of kind humans encountered along my path, some of them even facilitating my journey during the start of the floods season in this upstream stretch of the Meuse.
As it's explained in the second section of this chapter, these annotations and visual documents where useful to complement the few information I could retrieve from desktop research on the traditional water system of the French Meuse, illustrating it with the method specific to the graduation Lab in which this research takes place[1].

What follows is a synthesis of the four days journey, with annotations that help to respond to the question of this part of the research: the seasonal and more-than-human character of this landscape and its practices.

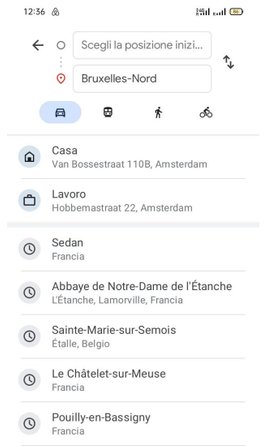
Because of the journey departing due to unforseen reasons in Sedan, and not at the French border as I planned to, I explored three of the four landscape types[2,3] that alternate upstream towards the sources of the Meuse:

- The Crètes Préardennaises, including Sedan, where the river runs through wide floodplains in a land of sandstone formations. This is a transition landscape between the Middle French Meuse and the Ardennes massive.

-Middle French Meuse: the longest landscape type, from Stenay to Neufchateau, meanders incised into the limestone plateau on the cuesta backslope.

-The Langres Plateau is the land of sources, a territory where rain infiltrates quickly through the sandstone

km -



km 0



km 0



Day 0 / November 13

km 0



Before the journey, the exploration of the French Meuse is cartographical. Navigating on Google Maps and other GIS systems, it is difficult to establish points of attention to visit during the transect.

km 0



The first sight of the Meuse arrives when I am still on the train on the way to the French border. Large dams punctuate the straight, wide river.

The valley here is rather scenic, dramatic, an incised trace of the geological force of the ancient river.

Day 1 / November 14

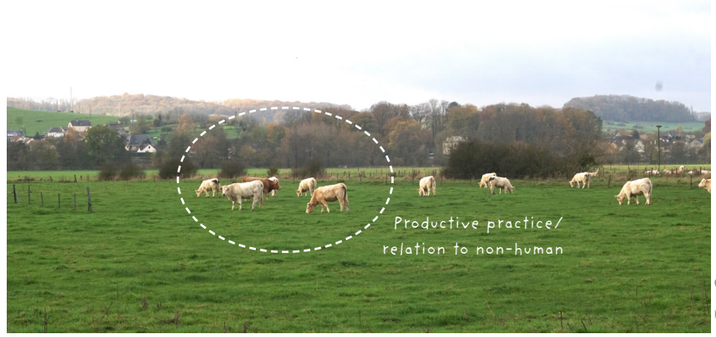
Cretes Préardennaises

After a short night of sleep in Sedan, I start the first day of biking by getting my tyres in the thick clay of the plain just south of the city, where Charolais cows graze the last grasses of the season.

In the cold morning, my few interactions start with the greeting of the many fishermen out along the river and the wetlands around its course. They fish pikes, sometimes a large catfish that infests these waters. Their knowledge of the river is impressive, and surpasses a local position in the international course. They know often about migration periods (for eels), or issues with allochtonous species upstream and downstream.

At the entrance of Mouzon, the river splits in two , partly towards an old lock marking the start of the parallel canal, the Canal de l'Est. I wonder when the gates have been openened for the last time. Asking a baker in the village, he claims the large barges passed by year more than 30 years ago.

km 6



km 15



km 21

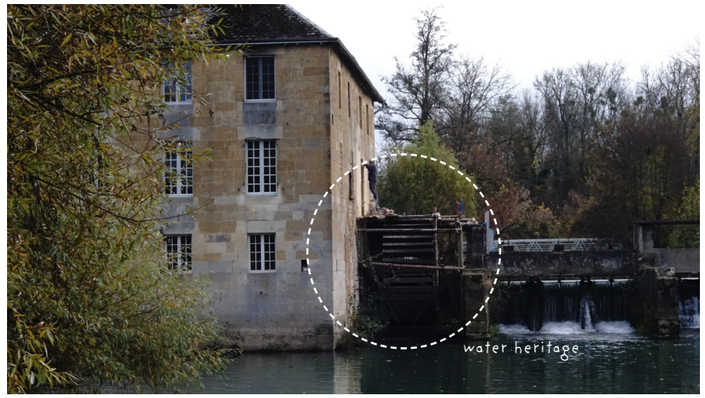


km 35



When I cross the river again, the sight of a long weir marks the horizontal landscape. It will be the last one of this size I will see in my journey upstream.

km 45



Towards the end of the afternoon, I enter the village of Stenay. Marc, the owner of an old watermill, now hotel, tells me the story of this remarkable building.
The oakwood wheel below him stands still since a little less than 100 years ago.

km 60



Day 2 / November 15

Middle French Meuse

At dawn, in the village after Stenay, I see for the first time the crystal clear waters of the Meuse from very close, standing on a low bridge.
The sight of the clear muds, covered and dried under the small waves of the Meuse marks a special moment.

km 60



Most of the cycling route is close to the parallel canal, hidden higher on the floodplain behind the prunus and hawthorn bushes that outgrow its embankmens.

km 60



The few signs of human activity in this cold november morning are the noises of the bulldozers slowly carving unaccessible landscapes behind the fence. Hidden in plain sight, the million years old sediments are going to find soon a far place from here.

km 88



One linear village follows the other at the edge of the plain. A panel clearly states that this river, even here, belongs to a larger European story.

km 89



Madame Christele, strolling her kids along the canal, stops for a chat telling her experience of a recuring sight in this region: the whole floodplain covered by water in the winter, becoming a lake outside of her window.

km 90



It is not difficult to imagine water rising, high in this lush landscape, higher than the small willow bushes on the water edge; the only testimony with its head above, this senescent ash.

km 90



Just after I say goodbye to the lady I stop for checking the route: in front of me, a solitary beaver finds its way in the waters of the canal. His den shouldn't be far from here.

For lunch I stop just before the largest city of the Meuse Departement, Verdun. Again, I get lost in the making and unmaking of the sediments on the low river channel.

km 110



km 110



km 110



km 137



As the river gets more narrow, the tight meanders are edged by the falling soil. I can see the river slowly making its way towards this side.

km 145



Unlike other villages of the Middle Meuse valley, I discover on Google Maps that Lacroix-Sur-Meuse holds a great density of 'lavoirs', wash houses where streaming water was used as a domestic resource. The floodable pastures, everywhere from the river meanders to the edge of the village, are still a dominant characteristic of the landscape here.

km 145



Next to the wash houses, the monumental fountains in the village display in a scenic manner the quality of the flowing resource.

km 151



Almost in Saint Mihiel, my final destination for the day, I assist to an important moment for the cattle grazing the lush plain of the river.

km 151



With her uncle, sister and a friend, Christiane gathers the cow herd to transport to the stall, for the winter break. The herd wont return here before early march. A stubborn small bull, left behind, gets very close to me before running back to his mother.

km 162



Not far from there, I see another version of the wash house typology, this time almost directly on the stream of the Meuse itself.

km 210



km 278



km 291



Day 3 / November 16

The Meuse gets too narrow to host paths nearby its course, I'm often forced to climb up the edge of the plain to make my way down south. The tall storage buildings of the agricultural cooperatives punctuate the transition to the cereal farming lands.

South of Neufchateau, the last city on its course, the Meuse splits in two streams of equal size. At this point, the "real" water line becomes a question for geographers to distinguish...

Closed wash houses are present in many villages of the region, I enter the territory of the Langres Plateau.

Day 4 / November 17

Langres Plateau

The permeable soil of the region absorbs immediately all the runoff. It is a territory where the water resource is valuable to store.

km 329



km 335



For the last kilometers, two dear friends, Louis and Gaby join my transect. We make our way to the gps point of "The" source of the river.

km 342



Next to its touristic monument it "begins", the same water that reaches the North Sea so far away from this land.

Looking upstream

2. Water stories

Learning from the transect

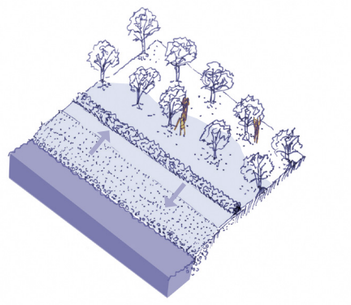
The fieldwork journey allowed me to learn “from the landscape” and its dwellers a number of aspects about the rhythm of the river and the practices around it. Acknowledging the bias of visiting this linear territory in a single moment in the year, I discovered that visible relations between the locals, the non-human (cattle) they work with, and the seasonality of the river itself exist throughout the French Meuse.

-The most prominent river related practice in the floodplain is the grazing of floodable meadowland. This was testimonied by the many herds and herders I encountered, and by the appearance of the plain landscape held in most places to low grasses. The herders have a direct connection to their small-scale agricultural exploitation, and a knowledge of the rhythms of the river punctuated by memories of recent winter floods and summer droughts.

-Water related architectural and landscape heritage exists in the form of the nowadays abandoned canal infrastructure, and the presence of iconic waterworks like the many watermills of the region, and the public wash houses present in many villages of the valley.

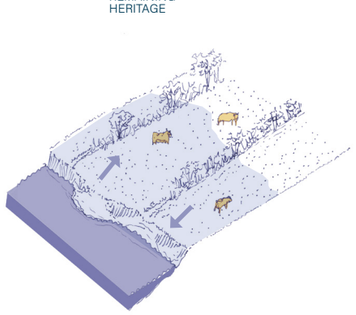
-Related to the more-than-human aspect of the river itself, the journey allowed to familiarise with the fascinating morphology of the free flowing, meandering river, and the plurality of the species inhabiting it. The (for me) exceptional encounter with a beaver during the transect is only one example of the animal sights that warmed my experience in those cold and mostly solitary November days.

DISAPPEARED

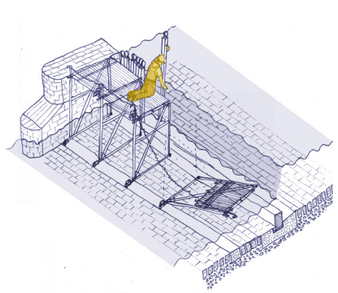


Orchards were present at the entrance of every village in the Meuse floodplain[2,3]. The sediments from river floods enrich the ground during the occasional high-water moments.

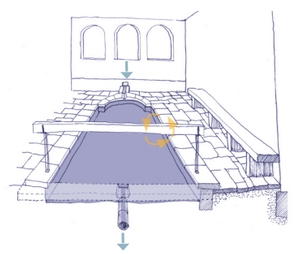
REMAINING HERITAGE



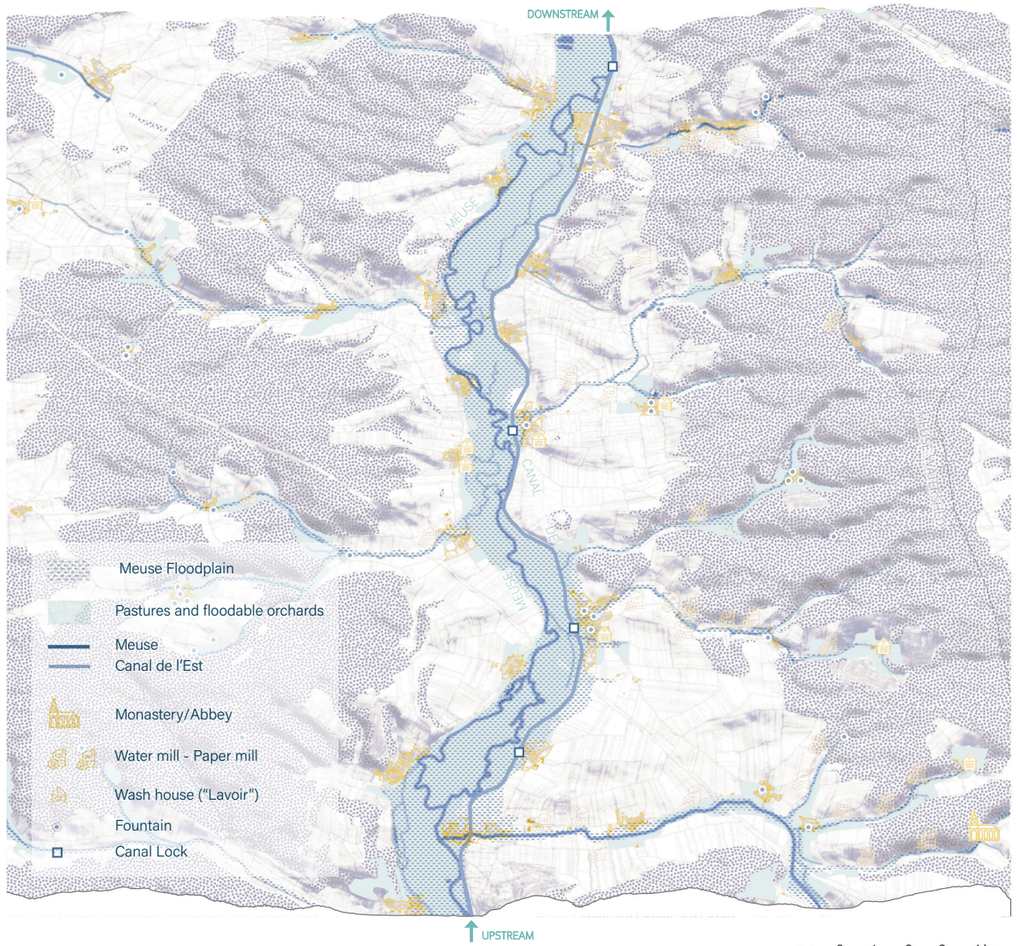
Floodable meadows are exploited for cattle grazing in the period going from early march to late november. During the floods season, the sediments enrich the soil renewing the fertility of this landscape.



The needle dam was a demountable system, functioning as river level regulator for navigation purposes[2,5]. In case of high discharge it was manually dimounted and laid on the river bed. The last dam of this type disappeared from the region in 2021.



Water from a captured source flows into the main basin of the wash house. As an evolution of the wash house directly built on the edge of the river, here the used water from the outlet of the basin would be directed to the Meuse through ceramic pipes[8]. These buildings were used till the beginning of the XX century.

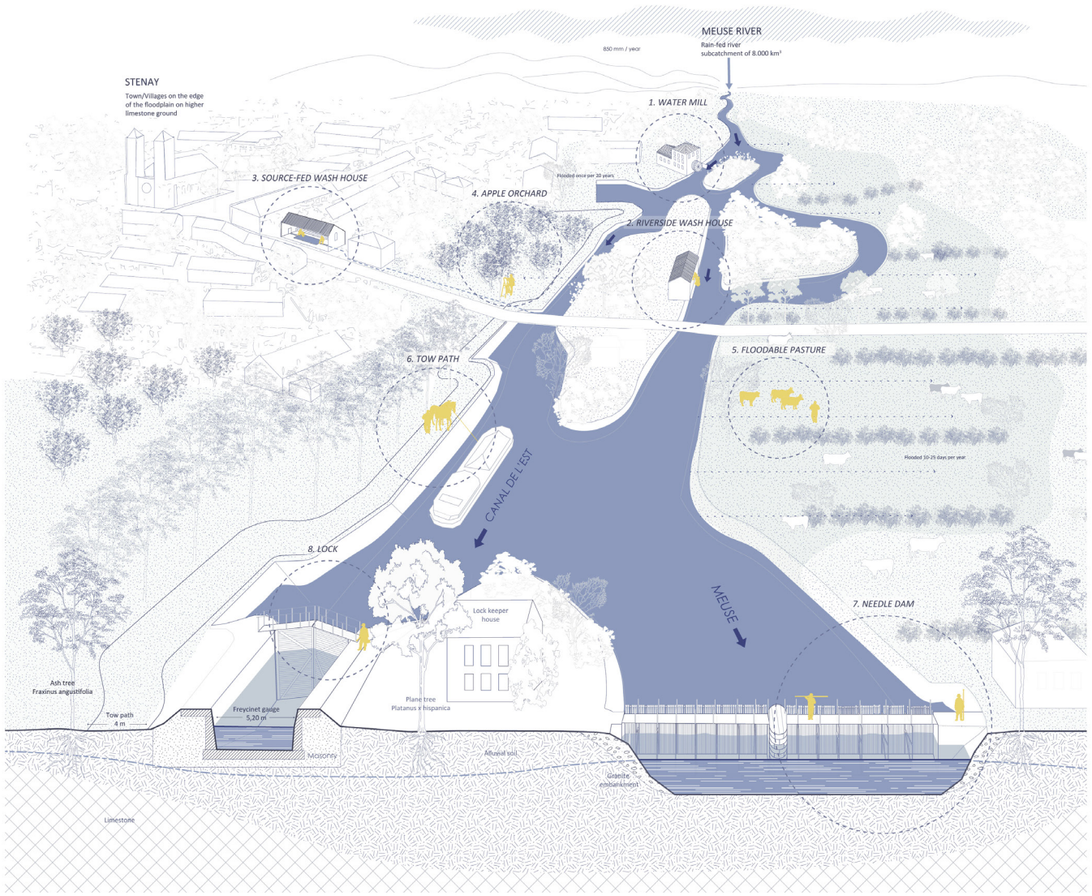


The cultural waterscape of the Middle French Meuse valley ans its tributaries, in its current appearance with fading traces.

Selecting elements and practices

Facing an high number of remains in the landscape (like the disused XIX century canal locks and the wash houses, often in ruins), the research of traditional water stories cannot be limited to the documentation of the existing. Delving into a handful of sources about the history of these elements[2,3,6,7] revealed the disappearance of other river practices. Floodable orchards, till the 1950’s a common land use on the edge of the floodplain around villages, or the needle dams recently replaced by automatic weir infrastructures, are two examples of lost heritage.

This information allowed me to reconstruct the appearance of the Middle French Meuse valley to illustrate what it looked like when these water- and landscape elements were used at the same time, till the 1920’s (Above and next page).



Section of the Middle Meuse Valley around the town of Stenay, as it appeared in the 1920's.

The ensemble of water stories

The Meuse riverwater in the Middle French Meuse was used traditionally for an array of human activites, characteristic for the communities inhabiting the settlements built along the river and its tributaries.

It can be said that water was locally used, or "borrowed from" the river, and then released back into its flow in a circular way.

This happened artificially with constructions such as the water mill (1) and the wash house (2), or without human effort in the case of the main agricultural activities in the floodplain. Orchards (4) and the pastured meadows (5) along the river where in fact cyclically flooded, enriching the alluvial soil. The manual maintenance and operating of the canal infrastructure is portrayed in the towing of barges on the tow path (6), and regulation of the needle dams (7) and locks (8).

More-than-human relational values

These practices have all in common a direct tie between the people involved in them, the animals required to perform the task and the river water itself, as a more-than-human entity. The flow of the river becomes more or less embodied in the actions of the dam keeper, the women washing clothes in the river, or the herders attending the wet meadows steering their cattle to graze the grasses enriched by the river sediments.

A categorisation can be made of:

- Direct relations to the river water (tasks like the washing creating an unmediated relation to the Meuse

- Relations with the river and its flow through a machine or waterwork (needle dam, watermill)

-Indirect relations with the river, through the living beings profiting from its cycle (orchard, pasture).

Direct relation to the river water

Images of the use of outside wash houses, directly on the course of the river do not exist. This photo of an closed wash house using sourcewater in the Meuse valley gives an idea of the direct relation established between the women washing and the flow.



Photo: n.d.

Relation through a waterwork

The (lost) value of the needle dam lies in being a man-regulated waterwork. Although requiring dangerous operations, the task of the dam keeper directly tied him to the force and rhythm of the river.



Photo: L'Ardennais.

In a similar way, less direct as requiring little maintenance, the water mill wheel puts the keeper of the mill in a personal relation to the regulated flow of the Meuse.



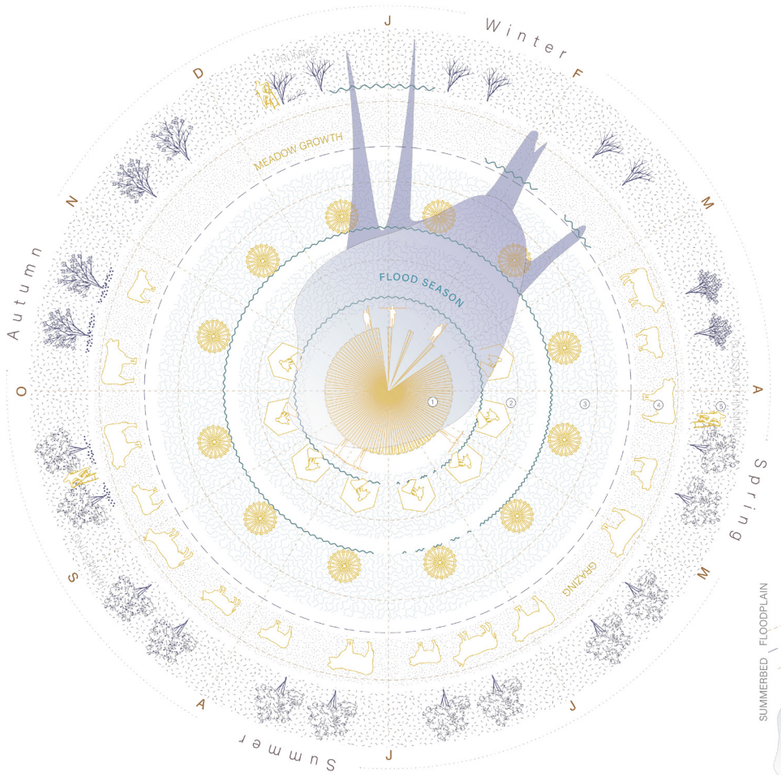
Indirect relation to the river

Floodable pastures are the set of indirect cultural relations to the river. Often far from the water itself, the herders are well aware of its seasons, letting out cattle to the fields at the end of winter and gathering it back when the floods start.



Looking upstream - conclusion

- Can (traces of) practices that rely on more-than-human, seasonal relations be found along the French Meuse?



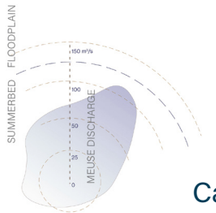
1. The needle dam
During periods of high discharge, the waterwork is dismantled and laid on the river bed to protect it from the incoming waterforce. In the summer, the dam is particulary useful to ensure a continued navigation on the river.

2. The washhouse
Washouses directyl on the Meuse were used mostly in the spring, summer and autumn seasons, when the river flow was not dangerous for the women practicing this domestic activity.

3. The watermill
The wooden mill, since it was built on a derivation of the main river course, with slower water, could be used throughout the year as a source of energy.

4. The floodable pastures
The pastures benefit from the enriching sediment deposits during the winter. Interrupted by the occasional flood, the growth of grasses ends around march, when cattle is set free to graze the pastures.

5. The floodable apple orchard
Higher in the floodplain, the apple orchards, for which the Meuse valley is famous in France, are cultivated on alluvial soil. Key moments in the production are the thinning and selection of flowers in spring, the harvesting from september to november depending on the variety, and the pruning of branches to increase proeductivity, during the winter.



Calendar of water stories in the French Meuse

Most of the traditional practices using the Meuse water in the Middle French Meuse are entangled with the rhythmic cycle of the river. As a rain-fed river, its discharge fluctuates between the summer and winter months, when recuring floods of a short period (3-4 days) inundate the floodplain.

Going from the center, with the most direct control of the river flow through a waterwork - the needle dam, to the outer rings of the circle being the floodplain activities, this spatial river calendar shows 5 key practices together, as they enter in relation with the water flow.

This brief research shows how water related heritage has a layered carachter along the French Meuse, with individual works and elements dating from distinctive time periods.

Their coexistence, active at least up to the 1920's, provides relational values to the Meuse, that are inscribed in the essential temporal carachter of the river flow.

Some of the studied waterworks, like the needle dam, are a local declination of infrastructures that facilitate intensive uses of the river water on the global scale of the river (chapter 1). While acknowledging their negative modifications of the course of the river and its floodplain morphology, these particular heritages, wether from pre-industrial or proto-industrial time, can be interesting to study as techologies that connect the keeper of the infrastructure more directly to the river than modern variations.

notes

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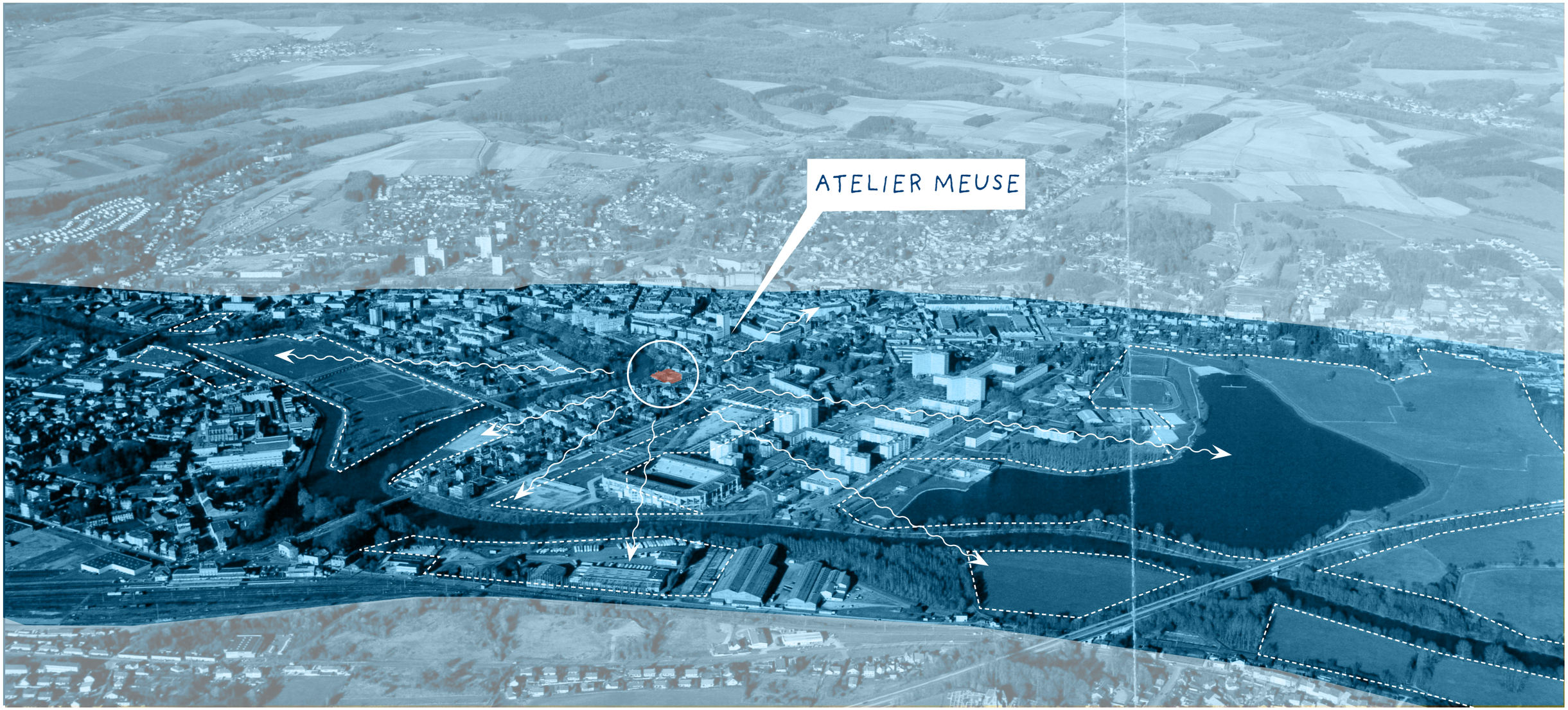


Sedan, France, N 49.69804, E 4.94275

3. Atelier Meuse

- How can a floodplain atelier in Sedan, France, serve as a landscape laboratory for attuned riverine practices and relations with the time of the Meuse river?

1. Positioning

1.1 Installing the *floodplain atelier*

Atelier: "Working group constituted for the purpose of a collective activity"[1].

The idea of proposing an *atelier*, as a territorial planning device in a stretch of the Meuse floodplain, comes from the need of grounding an experimental design methodology around the dynamic landscape figure of the Meuse floodplain, in a particular territory among the many landscapes of this international river.
As shown in the concluding cartographies of chapter 1, the city of Sedan is the first urban area downstream of the Middle French Meuse; this is a river stretch having the space to meander and express its seasonal variability in a floodplain with few anthropic pressures.

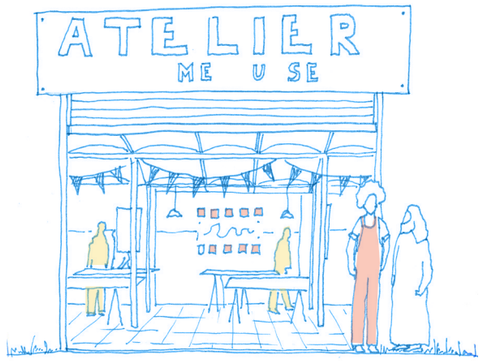
Like the diagnosis section of the following chapter expansively reveals, Sedan and its upstream plain are respectively a post-industrial and fragile agrarian landscapes, where previous river uses and practices have decayed. The lack of a current tie to the Meuse is, in this *paysage ordinaire*, an opportunity to collectively construct with its inhabitants a new phase of the floodplain territory, through new relational values and practices in attunement with the local temporalities of the riverscape.

Positioning the landscaper and its practice within the local cultural condition of the river, the *floodplain atelier* fictitiously begins in physical place in this territory, the ground floor of an abandoned textile manufactory in the city center of Sedan.

This idea came in February 2025, when I returned to the city for an immersive site visit, after my brief passage through it during the cycling transect documented in Chapter 2. A travellog of this stay, with personal impressions and site photos ordered chronologically throughout the visit, can be found in the annex to this report.

During an highly engaging contract with a duration of three years, I imagined the installation of the headquarter of a collaborative territorial project in the manufactory; with the initiative of the local authorities, alongisde other professionals (page 88), and with the local population.

As a rehearsal of such a process, the chapter focuses firstly on a problematisation of the territory, and then in the resulting proposal for a territorial plan, with its activation phase as a first step in the transformation of this landscape for and with a network of local actors.



In the Atelier Meuse headquarter, the territorial project meade by the landscaper is discussed, informed, and prepared for realisation with Stewards, the public and other actors within a new network.



The ancient Stackler factory, previously a mechanics garage, now abandoned, is a landmark of the Meuse riverside in the center of Sedan.
Its generous spaces on the groundflood could hypothetically become the headquarters of the Atelier, offering a permanent presence in the territory as a place for gatherings, workshops, and activities related to the landscape project.

1. Positioning
- 1.1 Installing the *floodplain atelier*1
- 1.2 Geographical and historical

2. Revealing
- 2.1 A threefold problematique
- 2.2 A vulnerable, fragile, fragmented river landscape

3. Attuning
- 3.1 Responding
- 3.2 Territorial plan
- 3.3 Phasing
- 3.4 Activation
- 3.5 Pilot projects
- 3.6 Propagation

Conclusion

The sequence of this chapter, the Atelier Meuse, reflects the phases of the territorial design it arguments and illustrates. Due to the longer articulation of this chapter compared to the previous ones, sub sections are added to better orient the reader.

The territorial design process

In analog way to recent projects that have involved a multidisciplinary team of landscape architects, sociologists expert in participation project, and artists[2] (next page), the Atelier Meuse aims at planting a seed for a participated "reimagination" of the territory, as a response to a number of landscape-related challenges that characterise it.

In the reality of the Atelier installement, absorbing impressions, stories and opinions from the inhabitants about the local landscape problematique would be a fundamental step towards formulating a design assignment. This would happen during an initial permanent residency of the landscaper.

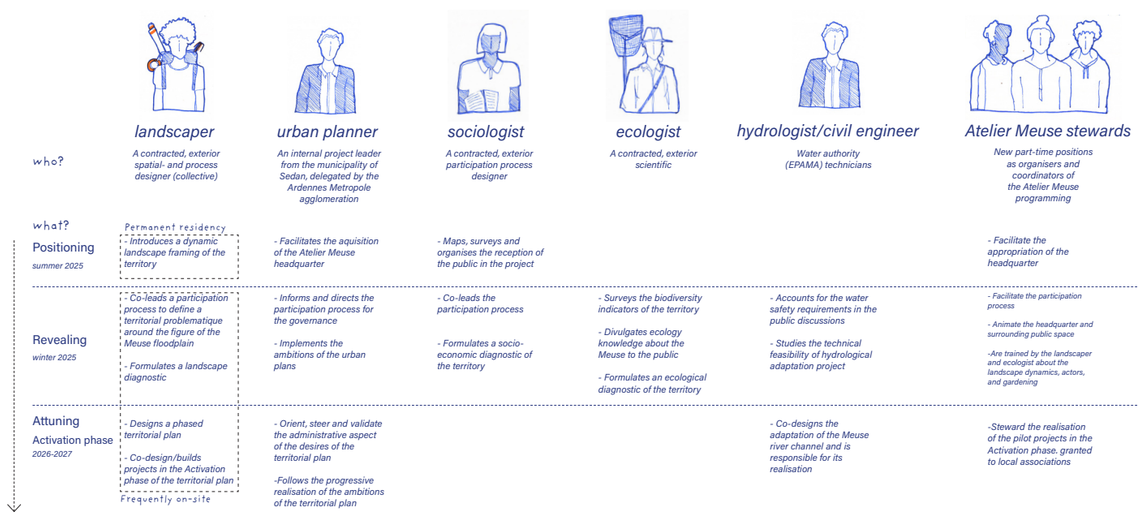
Due to the limited scope of this thesis project, I ask the reader to forgive me for not engaging with this process. I base instead the territorial diagnosing, in the *Revealing* section of this chapter on personal observations and a handful interviews with relevant actors of the territory.

The proposal of a territorial design that follows-up, in the section called *Attuning*, shows the spatial adaptation needed to react to this diagnosis, focusing on the co-engagement of a number of local actors in the construction and maintenance of the design through a seasonal cycle based on the local river rhythm.

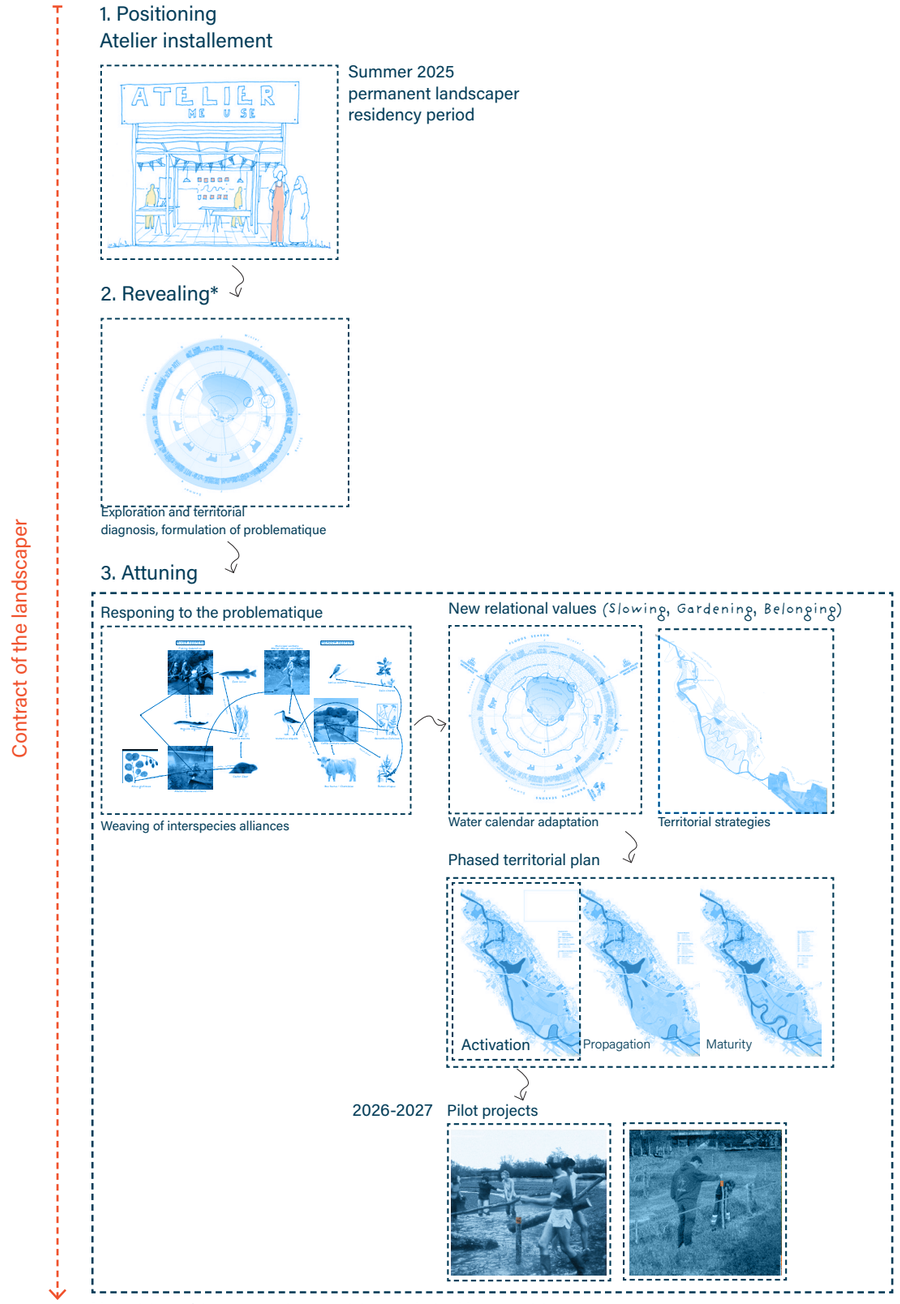
Finally, this Atelier will be contextualised as a test case for a transferable design methodology, lending itself to other sections of the Meuse river. This possibility is discussed in the concluding remarks of the report.



The goal of the site-specific territorial design is to react to a social, climatic and ecological problematique by bringing the community that inhabits the floodplain closer to its seasonal processes, as a consequence of the Meuse rhythm. Here an impression of the Coal Garden, one of the pilot projects of the Activation phase of the plan (page 160).



The organisers and collaborators of the Atelier Meuse planning process. Together with an ecologist and the engineers of the basin authority, the landscaper operates with a local project leader from the urban planning department on behalf of the Sedan agglomeration. The proposed new position of the Atelier Meuse stewards is further explained in the *Attuning* section of this chapter.



Methodology of the positioned territorial design - Atelier Meuse model.
*In reality, a participation process would help with determing the territorial problematique before starting the design phase.

Reference project : Enhancing the Vilaine river valley[2]

"A project of metropolitan interest launched in 2013 by Rennes Métropole and 7 municipalities, aiming at enhancing 3,500 hectares of valley and 25 km of the Vilaine River winding between Rennes and Laillé, with the following objectives:

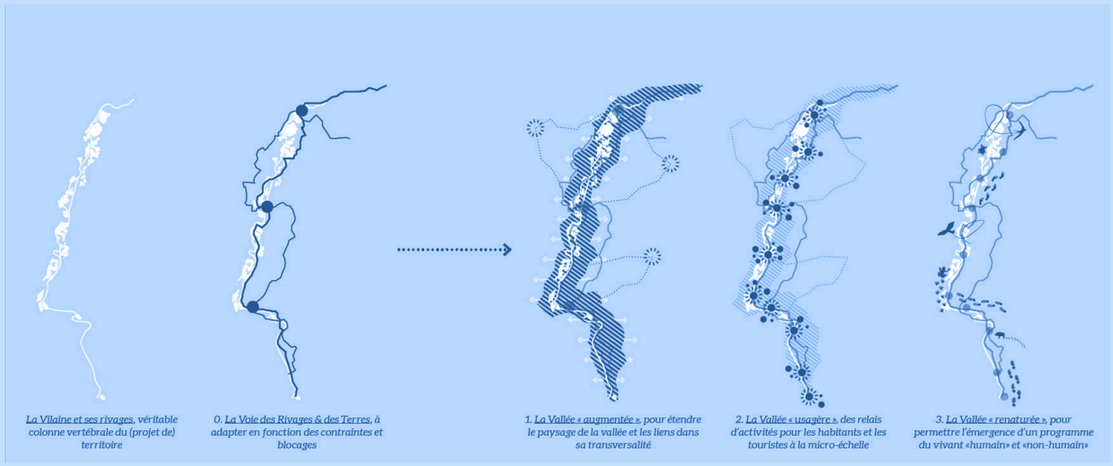
-Working from existing river conditions and maintaining balance among all components

-Revealing the landscape qualities of the territory

-Highlighting current activities and encouraging new ones." [2]



Permanent pontoon as part of the 2016 pilot projects. Photo: Agence TER.



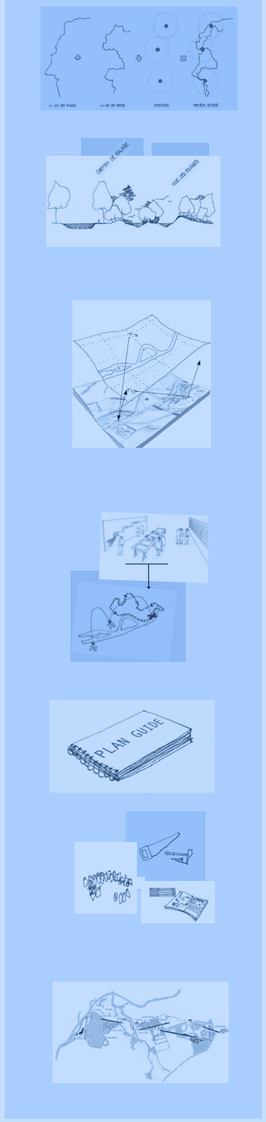
An initial response by the landscape architects (BASE Landscape)

Phase 3. In the form of a territorial plan connecting two routes (the Riverside Way and the Inland Ways) and three high-intensity sites (Prévalaye, Cicé, Boël), with a focus on amplifying existing qualities of the floodplain.





Phase 2. Parts of the design of the Riverside way. Photo: BASE Landscape.



1. 2013 Territorial vision (left page)

2. 2014 Riverside way

Complementing the towpath, reserved for soft mobility (pedestrians, cyclists, horse riders). It provides access to the natural and cultural heritage of the Vilaine: ponds, woods and forests, built heritage, iconic ecological environments, etc.

3. Pilot projects

These accompany the study phases like "pilot fish." They serve as tools for exploration, feeding the studies, co-creating the project, and envisioning it. They rely on artistic approaches.

4. 2015 Pilot project: Initiating

Crossings and exploratory walks were organized in the municipalities with stakeholders and residents to identify physical and symbolic connections to the Vilaine.
An exploration station made stops at strategic points in the territory to share the project and gather contributions. Each stop offered exhibitions, artistic experiences, exploratory hikes, children's workshops, and more

5. Plan Guide

These experiences contribute to the guide plan of the Riverside Way.
A guide plan is a framework document that outlines the project's overall vision, key spatial organisation principles, developments, and links to municipalities. The Riverside Way guide plan is currently under development, with participatory moments to confirm or refine ideas.

5. 2016-17 Pilot project: Prefiguring the design

Co-creating temporary projects and addressing challenges in work sessions with stakeholders.

7. 2018: Year of the Vilaine

One year of collective events led by artists and researchers, on the themes of relationing to the river, producing and nourishing, belonging to the valley

The design of the project trajectory by the social design office (Cuesta)

The storyboard of the project, with in bold the tasks that are led by landscape architects.

In this territorial design process, differently to the methodology of the Atelier Meuse, an initial physical framework in the form of a riverside path system is designed and realised in the beginning to allow other pilot projects to take place. This is not as urgent in the case of the Meuse, where a qualitative path exists along the river already. As I show in the course of the chapter, the territorial transformations needed by the Atelier Meuse project better lean on a phased activation by pilot projects. In this sense the methodology of the design is analog to that of the Vilaine in phases 1, 3-7.

1.2 Geographical and historical introduction

A threshold in the floodplain

As a first large urban area after the long free meandering river sequence of the Middle French Meuse, the city of Sedan marks the entrance of the river in a traditionally industrial valley.

The territory of the Ardennes urban agglomeration (Ardennes Metropole) was an important centre for metallurgical and textile factories, profiting from the freight transport on the canalised Meuse and the cooling resource of its streaming water. Since the 1980's however, most of the companies left the valley in a progressive deterritorialisation process, leaving out this part of the Meuse with abandonment, demographic decrease and a stagnating job market[3].

The city of Sedan, in particular, is slowly losing services and attractivity, since its last textile manufactories shut down thirty years ago. The little share of regional tourism it hosts is not enough to prevent the active population moving to the larger neighbouring city Charleville Mézières and other regional poles for better employments[3].

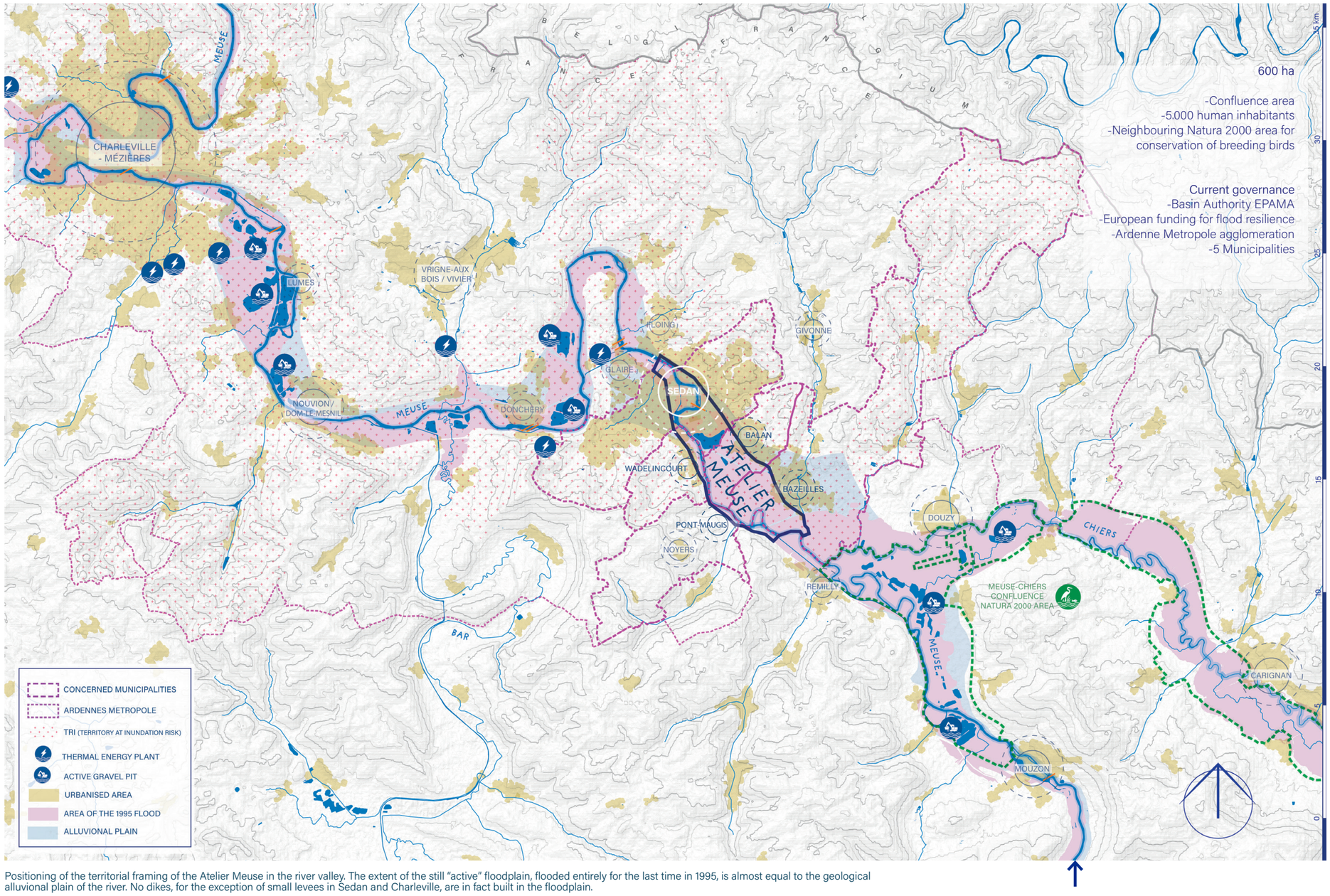
This socio-geographic situation has been the base for an hypothesis, namely that in such area of the Meuse floodplain with decreasing anthropic pressures, there would be somehow room for new river-related values, practices and relations.

A new territorial framing

A territorial framing that follows the length of the Meuse floodplain is needed for the design project in order to be tested: this is both the area for assessing the local landscape problematiques and the area of the proposed landscape plan.

As opposed to the direction of the municipal borders of Sedan and the neighbouring upstream villages, the framing of the Atelier Meuse follows a southeast-northwest direction, deliberately encompassing both built-up surface and agricultural land to work on the floodplain condition. Putting attention on both its urban and rural carachter. the result is a "new" territory of around 600 ha, where around 5000 human inhabitants live alongside other species dwelling the river space. In the neighbouring Natura 2000 area of the Meuse-Chiers confluence, an highly biodiverse wet environment thrives, where the only pressures are occasional active gravel extraction pits.

As shown in the map, the urban area of Sedan is partly built in the floodplain of the Meuse. Entire neighbourhoods lie on artificial soils slightly higher than the alluvional condition of the valley. When the waters rise to exceptional levels, these parts of the city are flooded. This happened for the last time in January 1995, a traumatic moment in the history of the city causing damages of the amount of 4 million euros[4].



Positioning of the territorial framing of the Atelier Meuse in the river valley. The extent of the still "active" floodplain, flooded entirely for the last time in 1995, is almost equal to the geological alluvional plain of the river. No dikes, for the exception of small levees in Sedan and Charleville, are in fact built in the floodplain.



















Unerasable from the collective memory of the city: the January 1995 Meuse flood. Stills from the French TV News on TF1. Photos: INA.



The collective relation to the Meuse is punctually marked by negative events, making the river a menacing force in the urban landscape.
Here, a crowd forms along the riverbanks n the city center, assisting to the rescue of a car fallen into the river upstream of the city.





Signs of vacant properties across the city, February 2025

The dynamic landscape figure of the Meuse and its floodplain

Although extreme events like the 1995 flood mark the collective memory of the city, the cyclical fluctuations of the Meuse discharge in Sedan, reflected in its water level (below), are more relevant to understand the general behaviour and rhythm of the river in this territory. The dynamic figure of the river, fluctuating throughout seasons, is a first tool of the landscaper to present the territory.

Similarly to the seasonal discharge differences of the global Meuse calendar represented in chapter 1, the flow in this upstream section of the river is diametrically opposed between summer and winter.

In the season of high precipitations, the plain upstream of the urban area floods on average three to four times, covering the fields in a period of low agricultural activity (right). During these recuring floods a few low parts of the city center, like the Torcy meadow and other smaller flood expansion areas also “disappear” under the water surface (Next page).

In the dry season, the flow often drops to critical levels (down to 30m³/s), exposing parts of the riverbed.

Extreme high water phenomenons recently start to outrule the usual winter distribution of floods: the peak summer flood of July 2021 is one expression of the sudden increase in



Calendar of average monthly discharge of the last 10 years (2015-2024) in Sedan.
The cylical winter floods (data of winter 2024), and the peak winter and summer floods that have exceptionally punctuated the calendar in the last thirty years mark the local rhythm of the Meuse.
Based on hydrographs retrieved on Hydroportail.fr

Sequence of a seasonal flood

1. BEFORE THE FLOOD

High groundwater level, saturated floodplain soil

5 days



2. FLOOD

Combined flood of Meuse and Chiers rivers: the lower alluvial soils are flooded

3 days



3. AFTER THE FLOOD

Excess water is absorbed in the ground.
Every flood leaves a layer of sediments on the floodplain surface

5 days



Due to data availability, screenshots taken from different winter floods of the last two years. Orthophotos: Sentinel 2.



The “Torcy meadow” in the center of Sedan during the seasonal Meuse floods (twice/three times a year). Source: L’Ardennais.



Rising riverwater in the agricultural plain upstream of Sedan (3-4 times per year). Source: L’Ardennais.

Seasonal floods



The “Torcy meadow” in the center of Sedan, dry situation. Source: L’Ardennais.



August 2022, critical low flows make the bed visible in the city center, at the level of the weir of Sedan. Source: L’Ardennais.

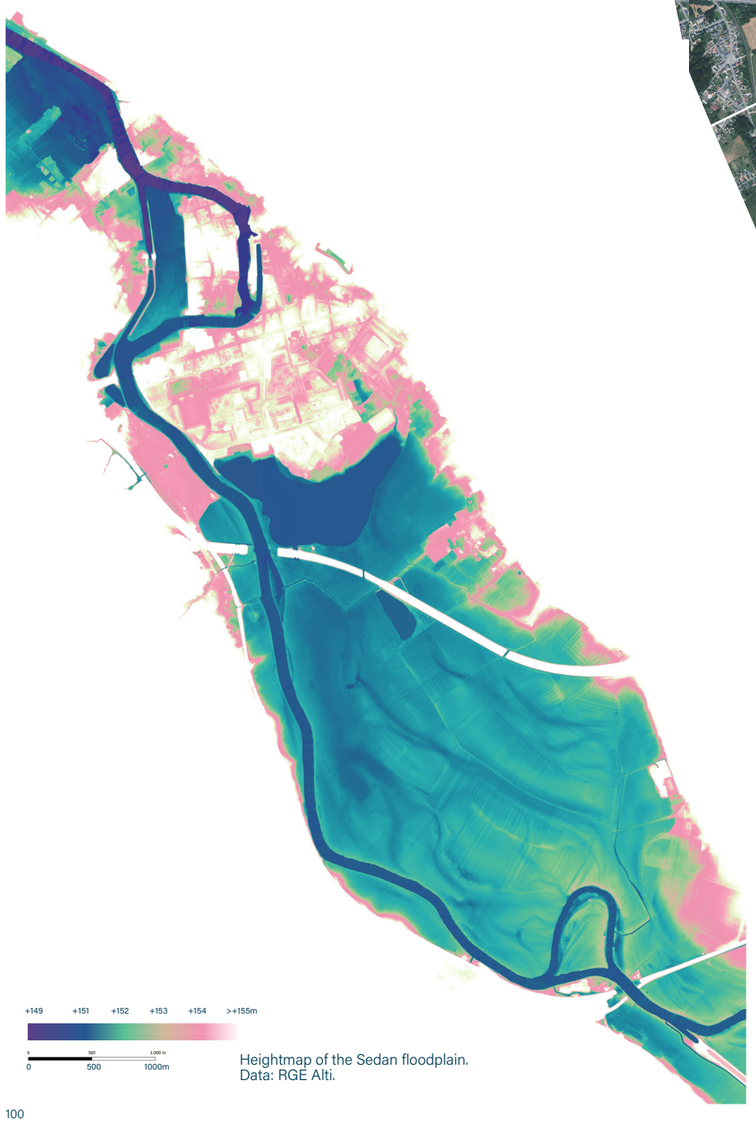
Seasonal droughts

An altered floodplain morphology

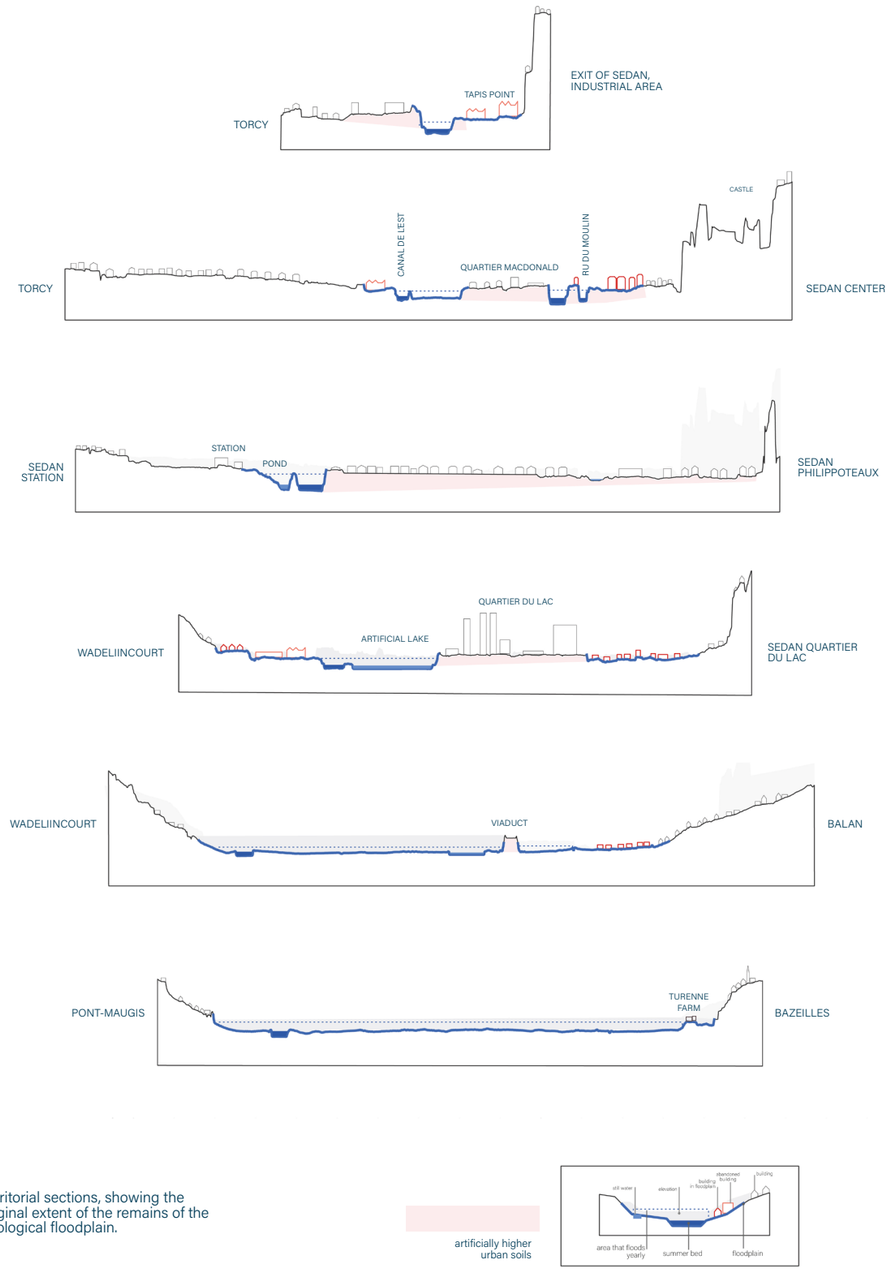
The reason why the entire plain of the Meuse in Sedan isn't subject to seasonal floods, lies in the altered topography of this territory. Large parts of the city are built in fact on artificial soil (below , right),makingthespaceoftheriverwaymorenarrow in this urbanised section. Another aspect that immediately appears when looking at an elevation map, is the position of the river. The geological configuration of a floodplain would make that its main channel would run at the center of the valley, differently to the current appeareance on its left side.



Orthophoto showing the position of the territorial secitons, 2025. Data: IGN.



Heightmap of the Sedan floodplain.
Data: RGE Alti.



Territorial sections, showing the original extent of the remains of the geological floodplain.

artificially higher urban soils

The course of the river varies in profile throughout the different floodplain sections. After the south-entrance of the city, it splits into two channels, creating an island that partially floods in case of higher discharges (Torcy meadow, fifth section from below). This space that the river is allowed to take, does not prevent the flooding of large parts of the urban area (in red). These are flooded in exceptional cases like the January 1995 event (period of return of 100 years).



The riverbanks in the city toenter look the same to what they did during the industrial expansion of Sedan. During that period, multiple textile manufactories arose along the Meuse, that was regulated with a weir as part as the canalisation works of the Canal de l'Est, which also has a branch in the city.

TIMELINE OF THE URBAN FLOODPLAIN TRANSFORMATIONS[4]

1846

Expansion of the fortifications to inglobe the village of Torcy. The Meuse is part of the defense system of the city.

1870

The defeat in the Battle of Sedan starts the destruction of the fortifications. Start of the construction of the new Canal.

1884

Celebrations for the Ville Nouvelle of Sedan: inauguration of the Canal, the Botanical Garden, the Station and the new monumental squares and boulevards. The Quai de la Regrette is planted along the Meuse.

1950s

A part of the center is reconstructed after the allies bombardement.

1963

The construction of the Quartier du Lac starts, together with the excavation of the artificial lake south of the city.

1992

A part of the center is regulated by a heritage protection zone.

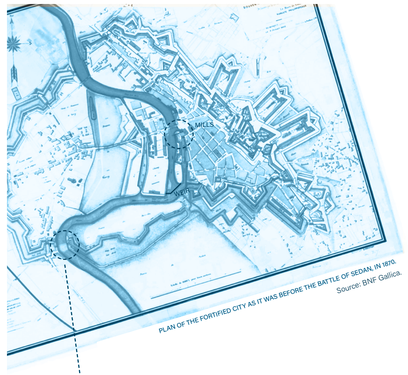
2019

The Quartier du Lac undergoes a urgency motivated urban renovation.

The space of the Meuse in Sedan through time

The Meuse waters enter the city after having gained in dicharge at the confluence with the Chiers river. Long time the inhabitants of Sedan profited from this constant water presence to establish wool processing manufactories, and for defense purposes (17th-19th century)[3]. At the turn of the 20th century, the demolition of the most of the city's fortifications allowed for the uprise of the modern city configuration. Marking a period of economic prospetity, this urban renewal was driven by the mecanisation and flourishing of the local textile industry. Large part of the city's current appearance stems from this period, with the exception of a number of post-war neighbourhoods built higher in the Meuse floodplain. For the agricultural plain upstream of the city, no clear cartographic sources exist to show the appearance of the river priorir to the canalisation of its course.

THE FLOODPLAIN AS A DEFENCE STRUCTURE (17th-19th century)



PLAN OF THE FORTIFIED CITY AS IT WAS BEFORE THE BATTLE OF SEDAN, IN 1870.
Source: BNF Gallica.

During the period in which Sedan was a fortified city, the river could be dammed temporarily to flood the upstream plain, in case of attack[3]. No precise accounts of this system exist, besides the marking of the position of the movable dams (below). Almost all the riverbanks in the city where artificially heightened in this period. In the city center, the river course was regulated to direct it to the city mills.

RUINS OF FORTIFICATION OPENING

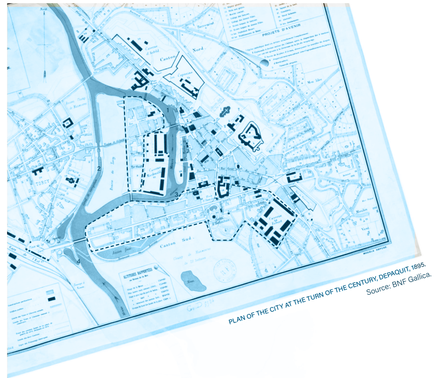


VIEW ON THE BATTLE OF SEDAN, 1870



Panorama of Sedan by Louis Braun, during the battle of 1870.
Source: Municipality of Sedan.

THE FLOODPLAIN AS A CANVAS FOR MODERN URBANISATION (end of 19th century-1950's)



PLAN OF THE CITY AT THE TURN OF THE CENTURY, DEPAQUIT 1898.
Source: BNF Gallica.

At the end of 19th century, urban expansions rose at the place of the demolished fortification, not needed anymore after the historical defeat of the French army in this city during the battle of 1870. The modern city grew further around the (canalised) Meuse, facilitating the upcome of the textile industry[3].

POSTCARDS FROM THE LAST DECADES OF THE XIX CENTURY



1



2



3



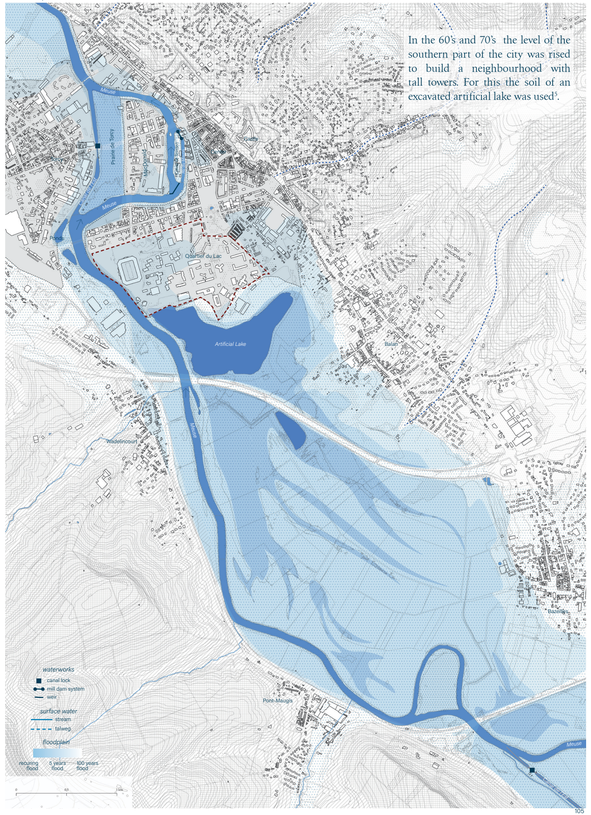
4

Source: Heguette & Gury, 2005.

BETWEEN TRADE AND LEISURE

THE FLOODPLAIN AS A THREAT (present)

In the 60's and 70's the level of the southern part of the city was rised to build a neighbourhood with tall towers. For this the soil of an excavated artificial lake was used[3].



2. Revealing

2.1 A threefold problematique

The following diagnosis section reveals the city of Sedan and its upstream plain as the overlapping ground of three intertwined territorial issues. Through GIS-Mapping , interviews with key actors of the territory, and photographic documentation I identified them as a schematisation of a complex floodplain reality that required an immersive on-site landscape exploration (annex).

The three issues can all be represented in a spatial river calendar, showing their temporal dimension and spatial extent whether in the city space or in the upstream agricultural plain.The three aspects are presented one at a time in the following pages, with the help of photos and thematic maps.

A vulnerable river landscape

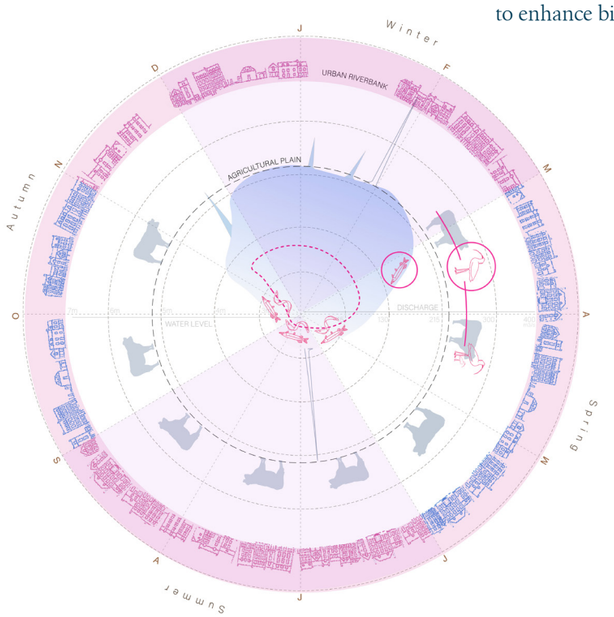
The floodplain proves increasingly vulnerable to the shifting rhythm of the river discharge, ranging from peak floods to prolonged droughts. The high degree of soil artificialisation of the floodplain is an obstacle in adapting to this variablity.

A fragile river landscape

The landscape bears the marks of socio-economic transformation: the slow erosion of its textile industrial identity has left behind a fragile cultural fabric with few interfaces that activate the river space.
Upstream, the century-old practice of cattle farming the floodable meadows is exposed to the intensification of agriculture in the plain.

A fragmented river landscape

The habitat of key species of the river's ecosystem suffer from fragmentation: the canalised profile of the Meuse offers reduced slow water habitats and blocks the migration of fish species; wet meadow habitats in the floodplain, valuable for breeding, meadow birds, are challenged by a coexistence with agricultural land uses.
The nearby Natura 2000 reserve at the Meuse-Chiers confluence shows the ecological potential of the floodplain environment, hosting species that could act as ambassadors to enhance biodiversity in this territory.



This calendar, showing multiple problematiques in the Atelier Meuse territory, is "unpacked" in the following section.

Between urban and rural landscape



Empty lawns along the Meuse in the center of the city are spaces where floods can expand when river water rises to critical levels.
Their poor spatial quality, and soil/vegetation capacity to absorbe water demand improvement.

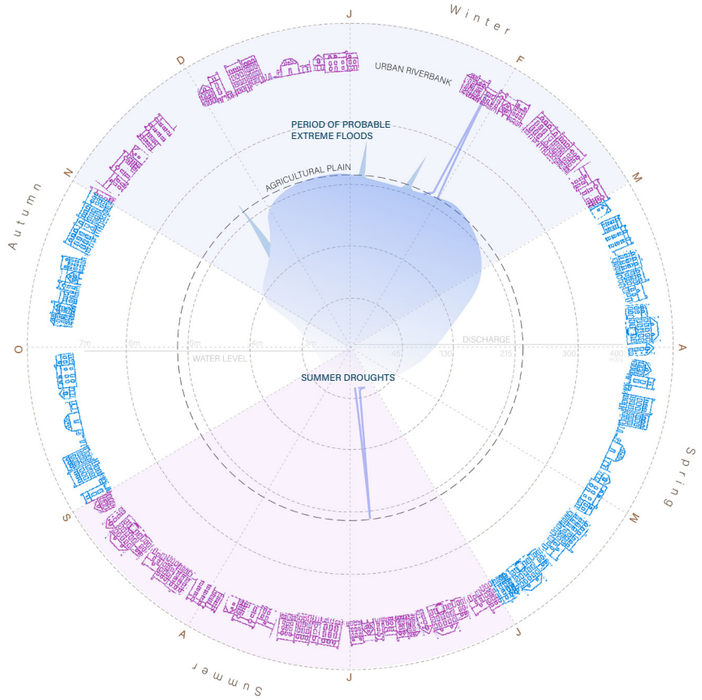


At first sight, the Meuse banks in the upstream agricultural plain appear rather "natural". However, their steep, canalised morphology is the habitat for very few species.

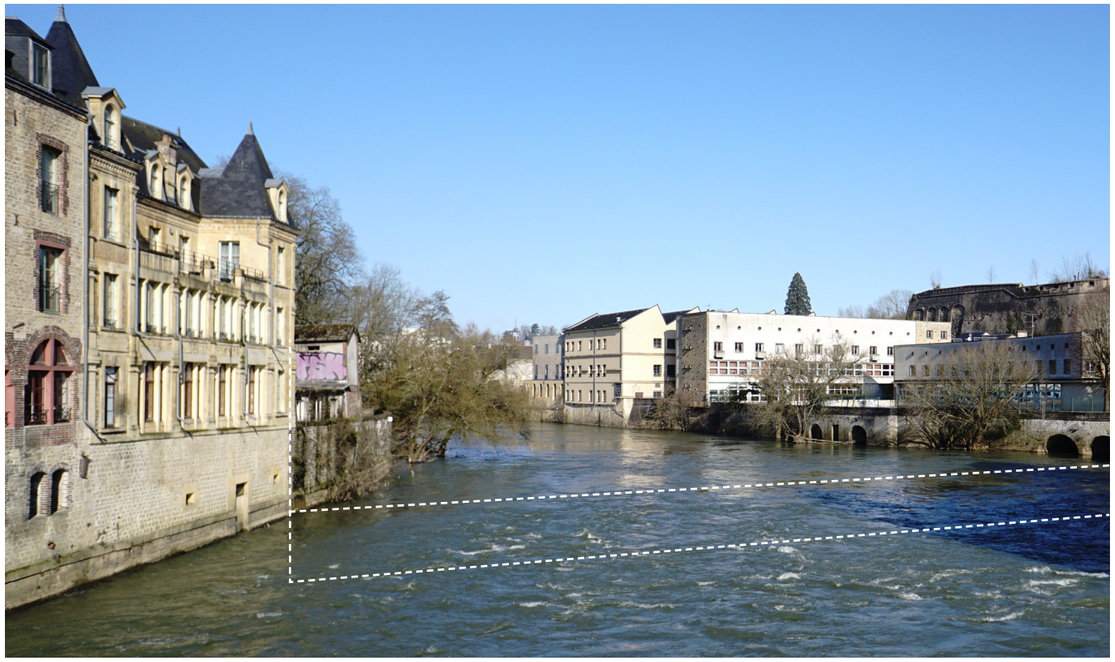
2.2 A vulnerable river landscape

During two periods of the yearly discharge calendar of the river, the morphology of the city appears inadapt to cope with the flow variation. Built to sustain economic activites all-year round along the river course, Sedan has been built over time in the space of the river. With high riverbanks, and a straightening of the river to evacuate its water as fast as possible, the city reveals itself vulnerable to flooding when the discharge increases up to a level where it has no more space to flow than into the streets. The urban fabric of sedan, highly artificialised, contributes in turn to the swelling ot the river by not absorbing most of the precipitation runoff on its paved surfaces.

These impermeable surfaces form a problem also during summer months. By increasing the heath island effect of the city in times of diminshed discharge, the temperature rise in the season where areas of cooling are most needed. Like the low-absorbing soils of the crop farming land[6], an increasingly prominent agricultural mode in the plain upstream, these artificialised soils also contribute to a lower groundwater (and river) level[6].



Two critical periods in the river calendar of Sedan, the droughts (from June to September) and the period where
extreme floods are more probable to happen again (November to March), after the last impacting one of 1995.



Embankment of the river in the city center, creating a faster flow to which bottle necks in the urban layout are vulnerable.



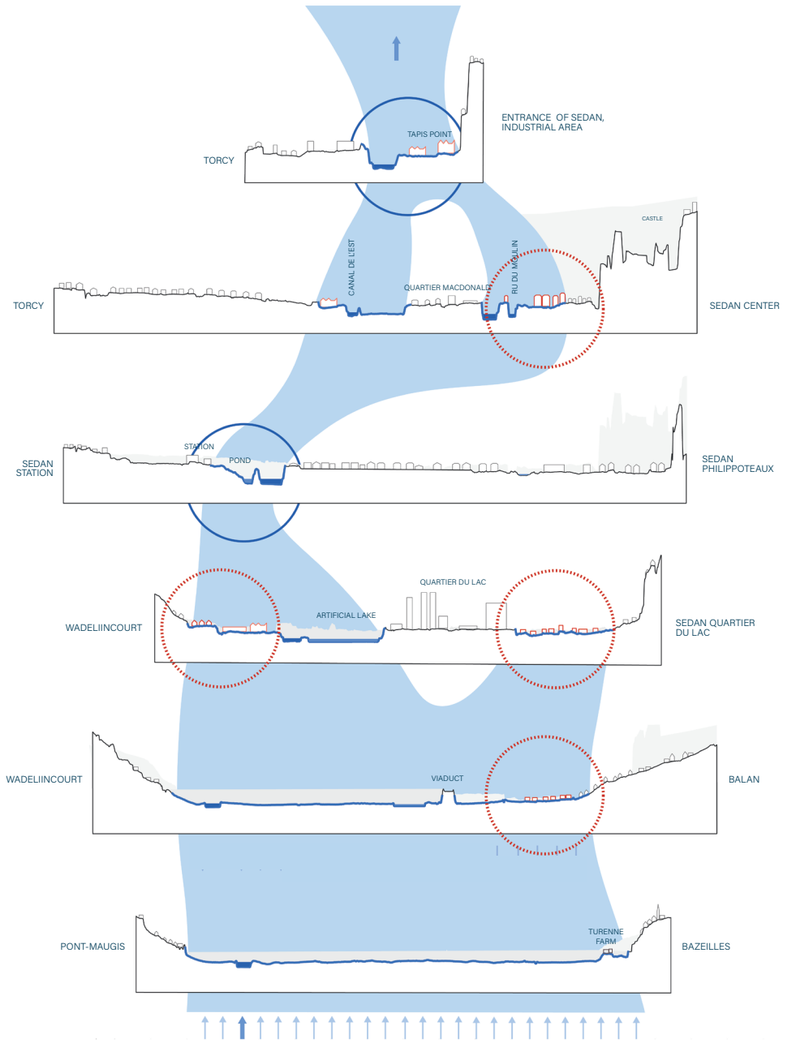
Most of the urban area of Sedan in the floodplain of the Meuse, is covered by impermeable paving, like tarmac, on which runoff is directed to the river, without infiltrating in the soil.

Floods

The encroachment on the floodplain space of Sedan created several bottlenecks in the channel of the Meuse, that in case of high discharge is blocked in these points and spreads its flow on the adjacent built areas. Even when they are artificially higher in the plain, they cannot stay dry in case of extreme events, like the January 1995 flood, where the level of the river rose to 7.25m (the average height is around 3m). Many of these areas are residential neighbourhoods, constituting a major safety risk.



The quartier du Lac in the south of the city, flooded in January 1995. Source: Facebook.



Flood vulnerability

Threats

RESIDENTIAL AREAS VULNERABLE TO FLOODING (100 YEARS PERIOD OF RETURN)

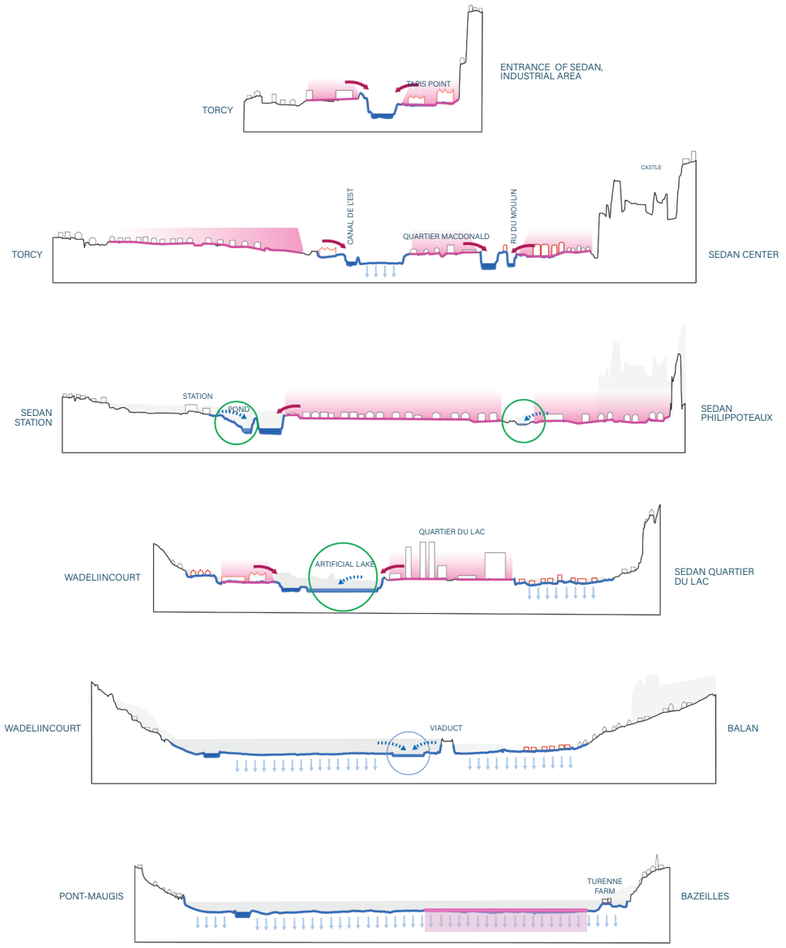
RIVER BOTTLENECK

Droughts

Almost 55% of the floodplain area studied in the frame of the Atelier Meuse is paved, or covered by intensive agricultural land (an equally disadvantageous land cover for the recharging of the ground water lens supply). Whenever precipitation falls onto these surfaces, runoff water is directed to the flow of the Meuse, which as we now eventually evacuates it to the sea.This water becomes precious in periods of drought, since the many dwellers of the floodplain need it for their life cycle. Not only humans suffer from heat stress in this context, but also other species that depend on water availability and its quality[7]. Among the many consequences of low water presence in the ecosystem, is for exemple its eutrophication, albeit an exceeding amount of nutrients lowering biodiversity. Together with more permeable soils, backwaters are an existing mitigating factors in the floodplain, although too few.



Drought and eutrophication of the Meuse. Photo: Frederic Mercenier.



Drought vulnerability

Threats

PAVED URBAN AREAS CREATING HEAT ISLAND EFFECT

CROP FARMING LAND LOWERING GROUNDWATER LEVEL IN THE PLAIN

Mitigating factors

STORING WATER IN BACKWATERS

Potential spaces for climate adaptation

Looking at the landuse in the floodplain, it is possible to draw a typology of the spaces that behold a climatic adaptation potential.

Due to the relative fast conversion possibility of agricultural modes, crop farming plots have an immediate potential. In contrast to permanent meadow land,used for pasture or forage, the “sponge” capacity of these soils is low, with high evaporation rates. In the urban space, plots like the flood-expansion lawns, partly disused parking lots, and abandoned industrial terrains have the potential to be converted and depaved.

UPSTREAM



CROPS



PASTURE/ FORAGE

DOWNSTREAM





LAWN







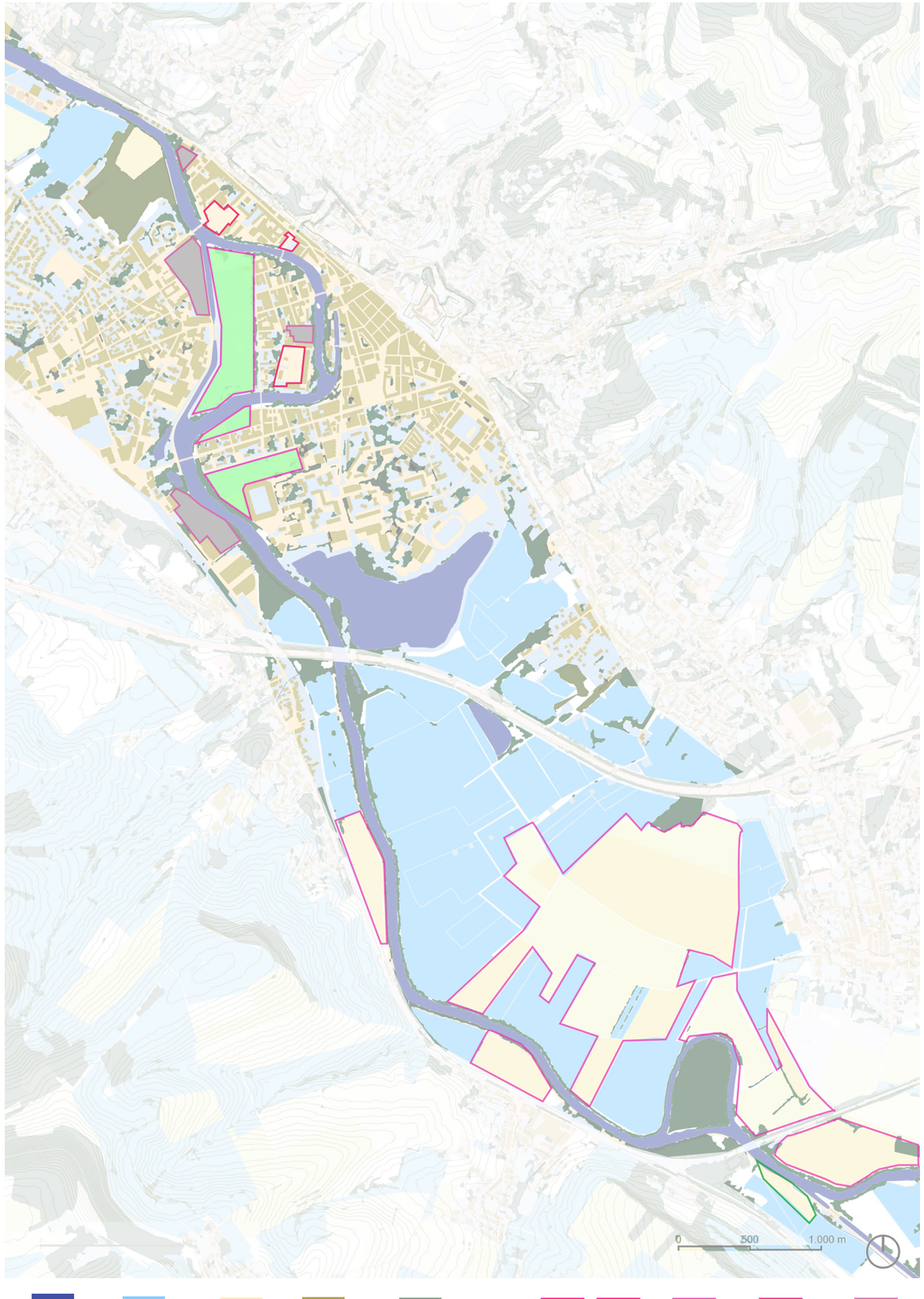


PARKING





INDUSTRIAL FRICHE



surface water

PASTURE/ FORAGE LAND

PAVED AREA

BUILDING BLOCK

FOREST

MAIS

BARLEY

CROPS (2024)

FLOOD EXP. LAWN

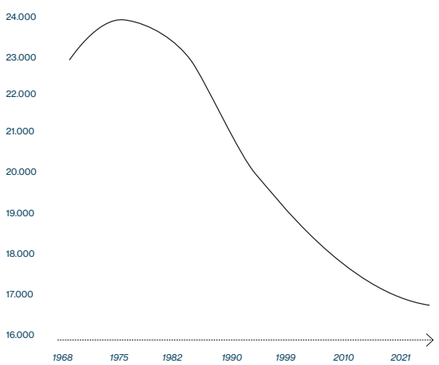
PARKING

INDUSTRIAL FRICHE

2.2 A fragile river landscape

The decreasing population of Sedan and surrounding territory reflects a shrinking local economy, once prevalently based on the jobs offered by the many factories of the city. The industrial river use, that went hand in hand with shipping on the canalised river throughout the whole year, has not been replaced by other ways of relating to the river space in the city. A handful architectural interfaces, facilitating public uses next to the riverbanks, form small active clusters along the Meuse. According to the head of the Heritage Service of the municipality of Sedan, the potential of abandoned industrial heritage in the city is a factor to consider to activate the public space around them.

In the agricultural plain, cattle farming modes in the floodable meadow survive, despite the threat of a changing river calendar and the expansion of crop land.



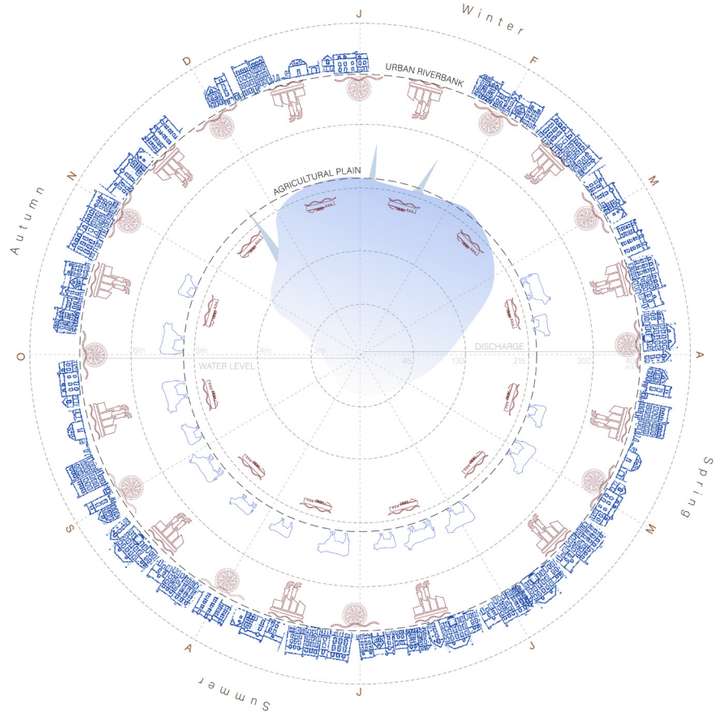
Total population of Sedan. Source: INSEE, 2021[8].

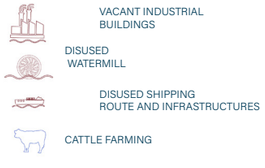


The abandonement and progressive decay of the industrial warehouse adjacent to the headquarter of the Atelier Meuse, in the city center of Sedan.
Part of the dying and spinning facility of the Stackler family, the whole complex was operative till the 1970's.

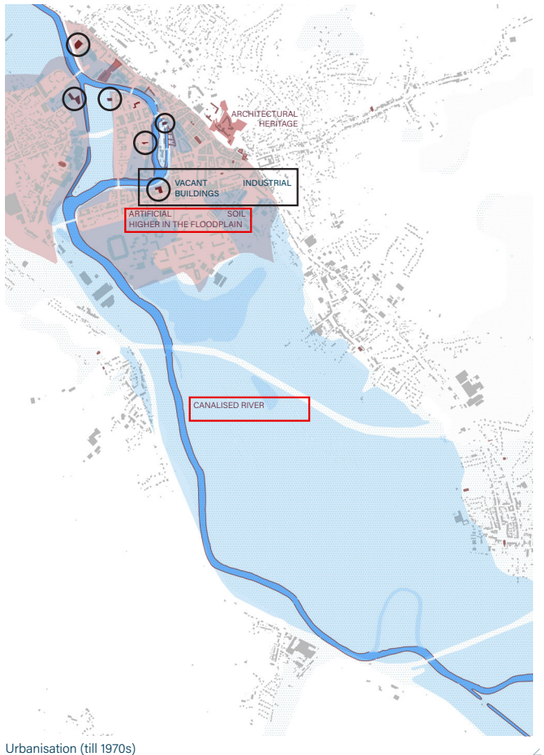


The Turenne Farm, a 16th century fortified, courtyard farm at the edge of the floodplain. Owned by a family since three generation, it is still active and the home to a business of 80-90 milkcows.

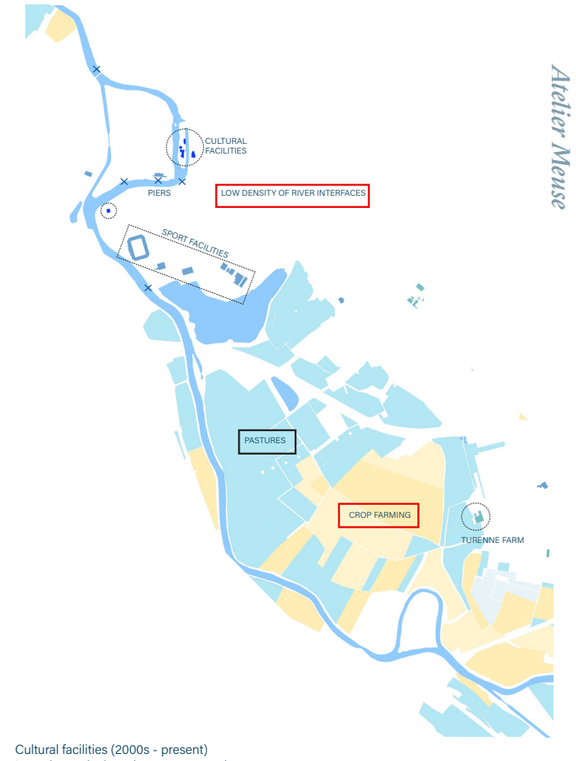




This spatial river calendar shows the fading of once prominent uses of the river water in the city.
With their disappearance, the city suffered from a progressive social crysis, reflected in a fragile relation to the river space.



Urbanisation (till 1970s)
Industrial use and flushing (till 1990s)
Freight shipping (till 1990s)



Cultural facilities (2000s - present)
Intensive agriculture (2000s - present)
Pastures (n.d. - present)

Valorisation of riverine heritage

What follows is a selection of parts of an interview with the head of the heritage service of the Municipality of Sedan, conducted on February the 28th, 2025.

- Can you present yourself and your employment?

My name is Constance Ertus, head of the Heritage Service of the Municipality of Sedan, our main missions are the documentation of the material heritage in the space of the municipality, its presentation and divulgation, and its valorisation. We also have a supporting role to projects of restoration and reconversion of heritage in the city.

- Can you give an overview of the role that the Meuse played in Sedan?

The course of the river was diverted various time throughout the 15th and 16th century, shaped by the the shifting geometry of the city fortifications. One of its oldest canalisation led (and still leads) to the main mills of Sedan.And then, of course came the textile processing facilities that are the largest part of the remaining heritage.

- How come that they are so prominent in the cityscape?

The textile manufactories arose in the city after 1642, in the moment of the annexation of Sedan to the Kingdom of France. In 1646 the Dijonval, the first royal manufactory of fine cloth in France. A number of facilities aiding the process of refining the raw wool arose around the city to support the production in this building: washing it with river water, fulling it (beating it) with machines driven by the river flow, or dying it rejecting the residuals in the river. This was the start of the expansion of these facilities in the city, that peaked at the end of the 19th century.

- Besides these, what other uses were possible with the Meuse water?

From a trivial point of view, the Meuse was used everyday to wash clothes, to wash the horses of the army (a cavalry division, the 'dragons', stable in barracks in the island of the Meuse from the beginning of the 19th century). The river was also used for early modern sport uses, like rowing, the rowing club still exists on the island.

- Going back to the manufactories and factories, what is their condition now?

Most manufactory buildings have been transformed in apartements, like the Dijonval. This pre-industrial typology had wide window bays, and developed on several floors, so it is suited for this



Constance Ertus, head of the Heritage valorisation and preservation service of the Sedan municiality. Photo: L'Ardennais.

reconversion.

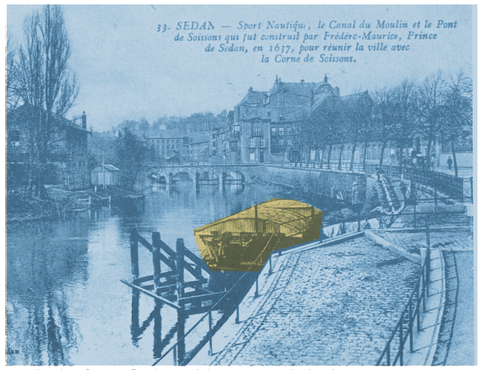
In the case of the Tapis Point, the carpet factory in the north parth of the city, along the river, this building abandoned since the 1990s is suited to a reconversion to a cultural use.

At this moment, a project of the municipality to rehabilitate it into a cultural pole is pending. Every two years, it opens for a few days for a photography exposition.

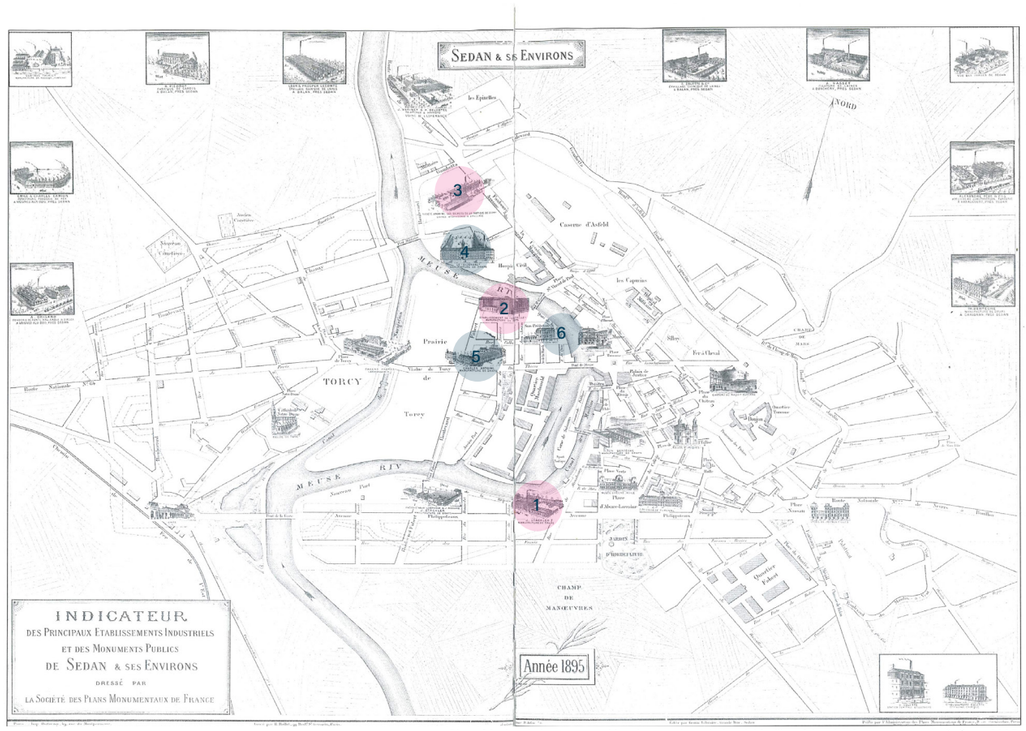
- How do you valorise the heritage of the Meuse?

We have some organised visits during the summer, in the summer season, that we lead to show the citizen of Sedan around the space of the Meuse. The points of interest, for example where the floating wash house was located, are explained, also to kids.

With a local nature conservation association, Le Renard, we did a combined visit to show the naturalistic wealth of the Meuse and its industrial heritage downstream of Sedan. This combination worked really well with the public.



Lost river interfaces: a floating wash house, present in the city center throughout the 19th century. Source: Heguette & Gury, 2005.



Plan of Sedan dating 1895, marking the prominent industrial facility of the city. Source:Heguette & Gury, 2005.

Vacant industrial heritage



1. Dyeing and spinning facility Stackler, active 1878-1973. Photo: SHS.



2 Woolen cloth manufactory Oudart, active 1894-1972. Photo: SHS.



3. Tapis Point de Sedan (Carpet manufactory), active 1890-2007

Transformed industrial heritage



4. Royal cloth manufactory Dijonval, active 1670-1958, now residential use. Photo: SHS.



5. Spinning facility Charles Antoine, active 1879-1943, now commercial use. Photo: SHS.



6. Dyeing facilities, active 1820-1980, now healthcare use. Photo: SHS.

A handful river interfaces

Besides the reconverted and abandoned former industrial facility in the city, a few other building types mark the urban landscape of the riverfront. Most of the linear space of the river does not have a strong tie to the city fabric (next page). Two main public building programmes mark this current relation of Sedan to the Meuse, the cultural and the sport facilities.

A cluster formed by the local theater, library and history museum (the site of the previous interview) exists around the Ru du Moulin canalisation of the Meuse. Its oldest derivation leading to the abandoned city mills. Three hundred meters from this very central hotspot in Sedan the boathouse of the local rowing club has its quarters, one of the few public spaces of direct interaction with the river in the city. The remaining sport facilities are mostly present in the 1970-s neighbourhood of the Quartier du Lac, such as the football stadium, a key public building in this city with few remaining facilities[3].

A handful small interfaces, in the form of floating pontoon, or the more monumental rampway to formerly wash horses , are scattered throughout the course of the Meuse.

ARCHTIECTURAL INTERFACES

Passive relation to the Meuse



2. Corne de Soisson Cultural Hub



1. Boathouse of the rowing club



Source: L'Ardennais.

3. Quartier du Lac public facilities



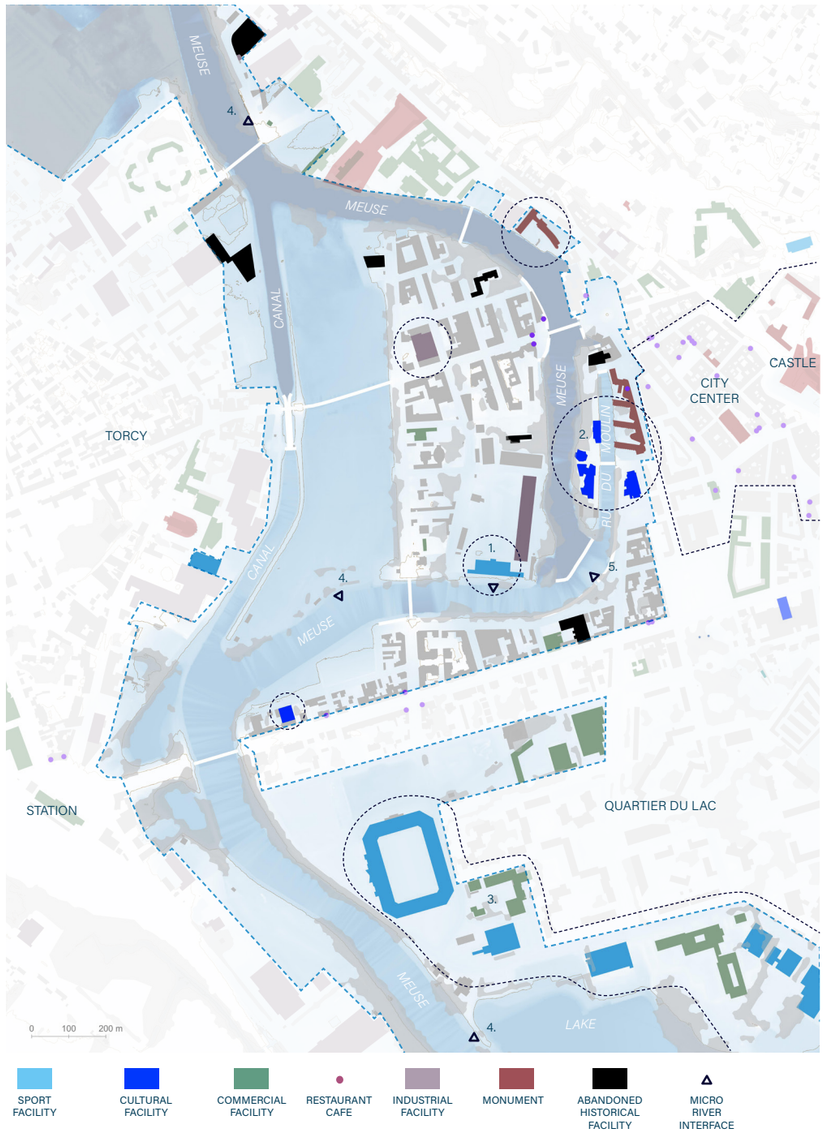
MICRO RIVER INTERFACES



4. Floating pontoons



5. Horse rampway on the Quai de la Regente



Zoning of the urban fabric activating the river space - typology map.

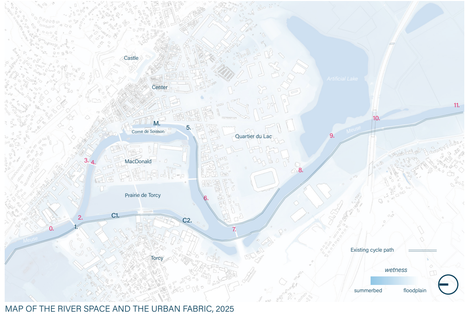


0. Below the Tapis Point factory, a meadow with a high qualitative potential.

The edge of the Meuse

MARCH 2025

This sequence of photographs taken at the end of winter 2025 synthesise the spatial quality of the riverside of Sedan, with the goal of highlighting existing value in-between spaces that could be designed or maintained differently to improve their landscape quality as public interfaces to the Meuse.



MAP OF THE RIVER SPACE AND THE URBAN FABRIC, 2025



1. On the right bank around this bridge, the riverbank is inaccessible.



2. Where the canal (right) joins again the main coruse of the river, the abandoned terrains of the Lombard factory are open to many



3. This parking completely blocks the view on the Meuse and the small pedestrian bridge crossing it.



4. View from the pedestrian bridge: the inaccessible northern edge of the island of the MacDonald neighbourhood.



C1. The "Voie Verte", along the Canal, is part of an international network of cycling paths along the Meuse.



M. In the derivation canal that leads to the former mills, the small dams block branches and other organic sediments.



5. The weir in the city center is an interesting spatial feature, constantly producing a water sound that draws to the riverbank.



C2. The southwest corner of the island, at the start of the Canal arm.



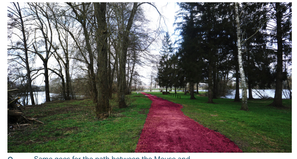
8. In front of it, the area of the football stadium. The path that leads to it along the Meuse is not paved, making it only suited in dry periods.



7. Looking upstream from the first bridge in the city, the large abandoned industrial terrain at the entrance of Sedan.



6. At the emplacement of the former coal harbour, the flood expansion meadow is a space with little spatial quality. A tree row was just planted.



9. Same goes for the path between the Meuse and the lake.



10. Under the noisy viaduct of the motorway, the passage appears abandoned.





11. The plain upstream of the city is a private landscape, with the meadows being fenced all the way to the riverbank

upstream

Cattle farming in the floodplain

In order to be introduced to the practice of carrle farming in the floodable meadows along the Meuse, an interview with the owner of the oldest farm of the territory, the Ferme de Turenne (XVI century), was conducted during the site visit.

- Thank you in advance for your time. Can you briefly present yourself, the farm, and the business?

With my brother Louis, I took over the Turenne farm in the 80's from my parents, who had 350 ha at that time. Till 2012 we maintained the beef production, after which we turned to milk cows. Today we have 200 ha on the municipalities of Bazeilles and Balan. Plus other 100ha around another farm more upstream. We have a permit for permanent grassland.

- How does the harvesting of the meadow go?

We aim at 'clean' meadow, at controlled growth, since we harvest it two to five times per year depending on the location in the plain. We have some wetter meadows, so the first mowing happens late June-early July and then the second one in September or October. Other meadows higher up are 'cleaner', the first mowing can already be done end of March or April, and if the weather is good with us, it can be harvested even five times in one year.

- So at what point the cows are inside, ore outside?

Okay so here, the cows are all year inside. Why? Because we are tired of the commentary of people, saying they are too skinny, we don't give them enough food and things like that. Since 7 or 8 years they are here inside, on the other milk production site, sometimes they graze outside.



Jean-Cristophe Lepage preparing his John Deere to transport his heifers to a local farmers competition.

- What are the requirements for milk- or meat- cows?

So here we have only milk cows, Holstein race. Other races like the Limousine or Charolaise have been bred for meat production. There are other mixed races, suited for both productions like the Montbeillarde or the Normande. Our veals, we sell them after 7-8 months after they are born.

- And what about the winter floodings, how do you deal with them for the production?

We don't have higher floods than before, but their moments are changing a bit in the year.
Before we had floods in November to March, in recent years we had floods in May, in June, July, August. Only in the months of September and October we didn't get floods. This is quite new.



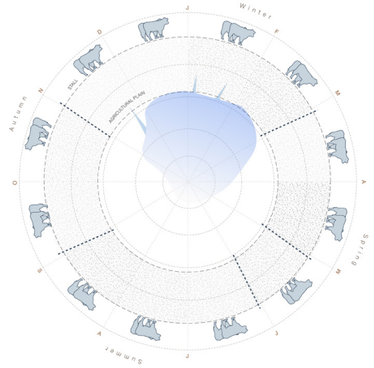
The home to the holstein cows owned by the family business of the Lepage brothers.

- And what about the droughts?

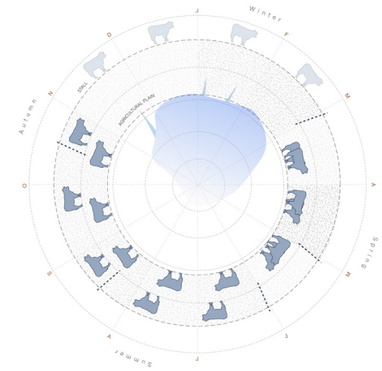
Yes, it was hard three consecutive years, in 2020, 21, 22 I believe. This is also what people don't understand. I ask them sir, do you have a lawn at your place. Yes. Do you mow it all year long? No. If it's too warm in the summer the lawn is not growing. And this is the same for our grassland, we are forced to make stocks for this period, and also for the winter months.
We don't have a supermarket at 5 kilometres where we can buy food for the cows all year.
Today, the impact of the floods and droughts forces us to have a stock of 15-16 months of hay.

- In November, around Verdun I had talked to farmers that do a bit both, with the cows outside and the mowing, I didn't really understand how it works?

So the rules that I learned at school, is that if you have 100 ha of land, you have to mow 50 to make a stock for the winter. In the month of June, you can put the cattle in half of those 50 ha, because grass is growing less throughout the summer to August. The 25 ha that remain ungrazed, you mow it again to make stock. But this was good 10, 20 years ago. Now it has become impossible. You have no certainty with the floods, and the droughts. If you don't have the stock you can't survive.



Forage land - indoor breeding



Pasture land with periodic mowing

Drawing of the two meadowland culture types mentioned by Mr. Lepage, in the spatial river calendar. The dotted lines indicate the mowing of the meadow.



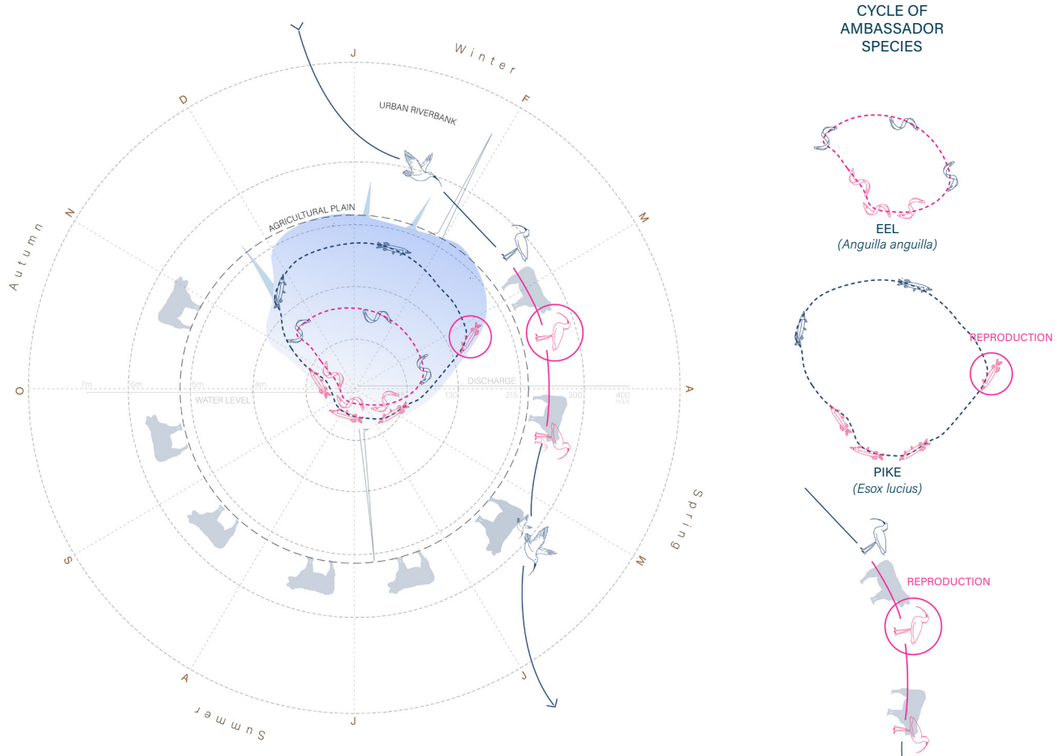
Photo of the Meuse plain in the municipality of Bazeilles Taken in November 2024, during my cycling transect. Infrastructure in the fields are the pumps for drinkwater supply of the territory.

2.3 A fragmented river landscape

Examining the floodplain from the point of view of an ecologist, it appears that the diversity of terrestrial and riparian habitats along the Meuse in this territory is limited to meadows with regularly mowed grass, or pasture land. Abandoned industrial areas or friches, however hosting an high biodiversity are hard to manage and valorise due to stratified pollution.

Within the large, regional and ultraregional ecological structure of the Meuse, a number of key species are monitored and their habitat protected to ensure their conservation. Two fish species, the pike and the eel are representative of two different river habitats: the first using its backwaters for reproduction in march, and the eel migrating throughout the course of the Meuse, requiring an interrupted water flow for these deplacements. The periods of low flow are also problematic for both fish species. needing enough water to move around the underwater space.

Ambassador species of the neighbouring Natura 2000 area of the Meuse-Chiers confluence, the curlew is an important breeding bird that comes back every year on the wetlands and wet meadows along the Meuse for reproduction. In the area of the Atelier Meuse, few patches of this kind of habitats exist, although when this bird and other similar migrating and sedentary birds breed it is also the moment when cattle starts to graze the floodplain again after the winter.



The life cycle of key ambassador species, in direct relation the rhythm of the Meuse. The habitat-continuity of European eel, migrating throughout the course of the river is compromised by the many obstacles it encounters.
The pike, key species in the ecosystem pyramid of the Meuse, suffers in this section of the Meuse from the lack of backwaters where it can feed and reproduce. A representative breeding bird of the meadow landscape, the Curlew lacks in turn of wide patches where it can reproduce in early spring.

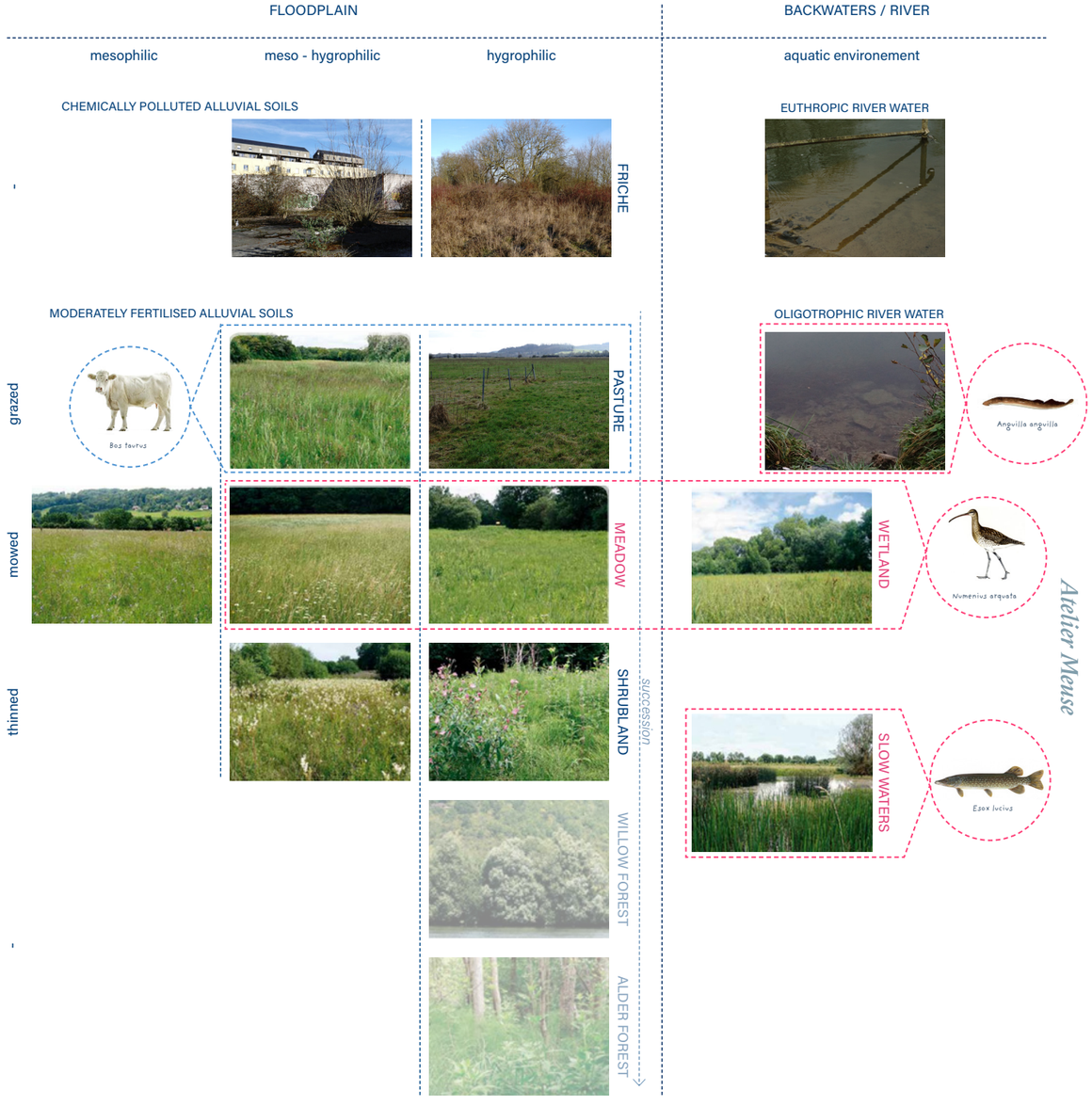


DIAGRAM OF THE FLOODPLAIN, RIPARIAN AND RIVER ENVIRONMENTS

Diagram of the different floodplain and river environments of this section of the Meuse. From mesophilic (dry) to hygrophilic (wet) condition, different species represent the pastured or mowed meadow, and the shrubland type. These create different spatial experiences related to color and shadow.
In this territory, the challenge is to retrieve a diversity that can combine cultural practices like open air cattle farming, with the conservation of meadow, wetland and slow water species.
Own interpretation based on the articles by Grevillot & Muller, 2022[9]., the manual by Conseil General de la Meuse, 2014[10]., Fernez et. al., 2015[11].

Spatial requirements of the ambassador species

Drawing from literature what the habitat requirements of the three non-domesticated animal species are[9,10,11], different fragmented existing areas in the Atelier Meuse territory can be pointed out (right).

What the curlew and the pike have in common, is the need of a diverse water flow creating areas of wet meadow or backwaters. The eel, not stationary in the territory, requires in turn a contuinity of the river flow, challenged by the presence of the locks and weir in the center of Sedan.

The potential of beaver-driven ecosystems

Existing research in ecology[12] indicates the beaver as an important ecosystem-engineer species, that fabricates slow water environments by partially damming river flows. This species, reintroduced in the Belgian Meuse in the 1990's, migrated upstream to the Middle French Meuse, where different clusters of the beaver start to colonise the meandering river.

Its presence could be favorable factor in creating more favorable environments for the pike and the curlew, without affecting that of the eel[12].

EURASIAN CURLEW
(Numenius arquata)

-Wet meadow patches for breeding
-Sufficient space for overview on predator birds



EUROPEAN EEL
(Anguilla anguilla)

-Unblocked river flow continuity





PIKE
(Esox lucius)

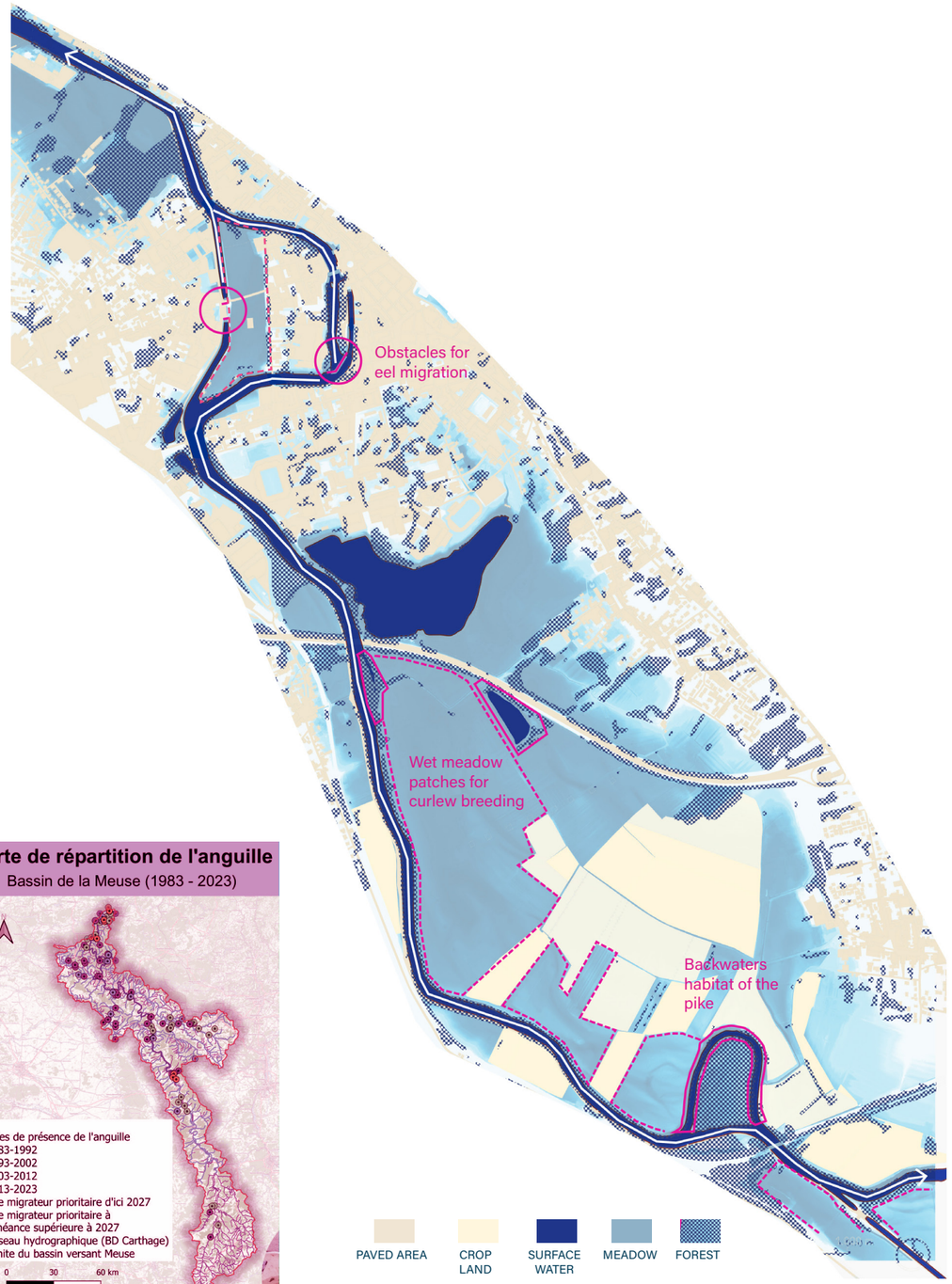
-Slow waters with high vegetation to hide for hunting
-Gentle river slope to deposit eggs during reproduction



EUROPEAN BEAVER
(Castor fiber)

-Shallow river bed
-Sufficient perennial vegetation and trees for dam building

Source: Wikimedia Commons.



. Distribution map of the european eel in the French Meuse.
The section of Sedan is indicated as a prioritary migration corridor. Source: EPAMA, 2024[13].

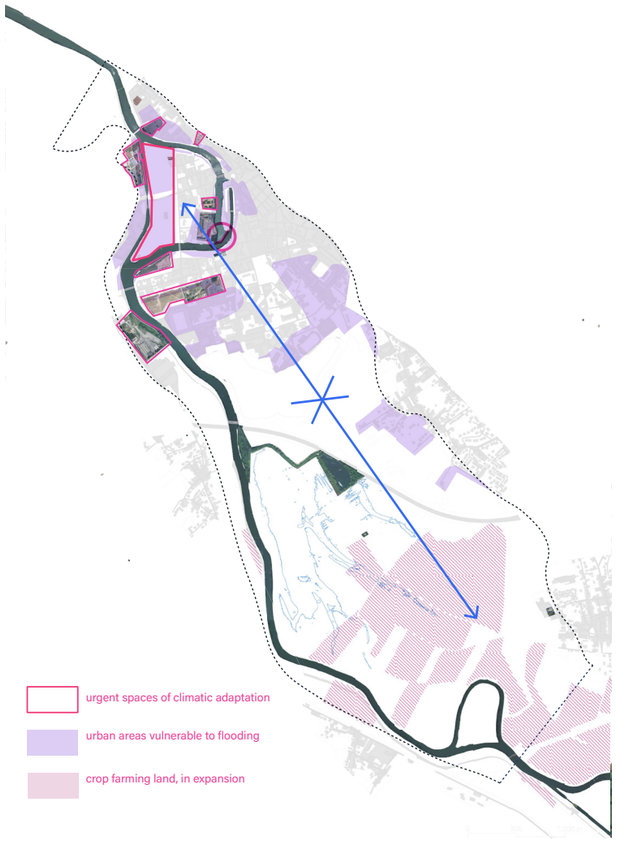
3. Attuning

3.1 Responding to a vulnerable, fragile, and fragmented river territory

The threefold territorial problematique, resumed in the previous section, is the combination of climatic, socio-cultural and ecological challenges that mark the territory of Sedan. As I approached this landscape in two moments, briefly passing by it with my transect in November 2024, and more immersively during my site-visit at the end of February 2025, the gaze of the external landscaper, has allowed me to formulate the three issues as spatial challenge around the rhythmic figure of the river.

In order to start formulating a spatial design in response to this problematique, during a phase of design experimentation I approached the mitigation of the three problems with different types of adjustement of the spatial calendar (right page). To respond to the issue of vulnerability, this meant steering the discharge-cycle itself, by adapting the summerbed of the Meuse, but also addressing the space of its floodplain, focusing on an improved 'sponge' capacity of the soil. This goes through a different management of the floodplain habitats, that has an effect on its terrestrial biodiversity. In this phase the ideas of *slowing* and *gardening* the floodplain emerged as key values of the territorial design.

Thirdly, an intuition during the site-visit completed the triad of cross-responses to the problematique: observing how closely connected the human actors of this territory are, because of its relative small extent, I had the idea to make their alliance (also with non-humans) the start of a process of *belonging* to the Atelier Meuse territory (next page). This is a partial response to its current fragile post-industrial identity, but also the central question of the device of the *floodplain atelier*. The building of this network requires a clear positioning of the role of the landscaper within these alliances.



Synthesis map of the territorial challenges.

Threefold problematique



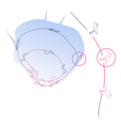
A VULNERABLE RIVER LANDSCAPE

To the consequences of flood and drought



A FRAGILE RIVER LANDSCAPE

As a previously industrial city suffering socio/economic/demographic decline

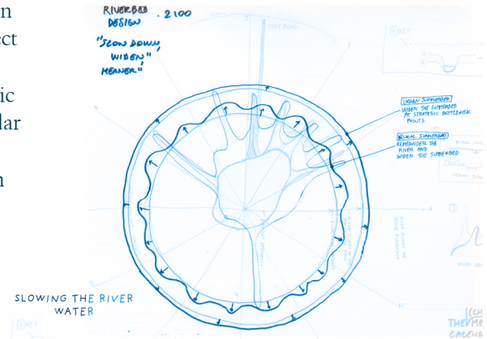


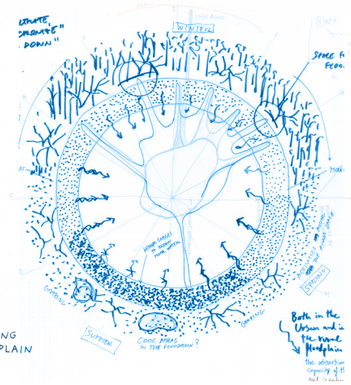
A FRAGMENTED RIVER LANDSCAPE

Missing habitat diversity and ecological continuities

Design experimentation through the calendar

Sketches of the adaptation of the current spatial river calendar of Sedan. The upper one is the intervention on the summerbed,in order to delay peak flows and protect the city upstream.
The bottom one shows another spatial range of climatic adaptations, starting to navigate in the complex calendar of cultural, agricultural and ecological seasons to improve the overall "sponge" capacity of the floodplain soils.





Cross-response: (relational) values of the territorial design



SLOWING

the river flow to mitigate floods downstream and create new habitats, infiltrate as much possible water in the territory



GARDENING

Gardening as a collective, interspecies maintenance philosophy of the river edge and the meadows of the floodplain



BELONGING

as territorial place-making, towards new river hotspots and interfaces, and (slow) mobility in the floodplain territory

Atelier Meuse

The landscaper as weaver of interspecies alliances

The conceptualisation of the landscaper as a coordinator of multispecies alliances is directly inspired by the view on the discipline of Michel Corajoud. His contribution to the current tradition in french landscape architecture resides in design frameworks in which landscape design is deeply embedded in the cultural and ecological governance of human and non-human habitats[14]. This vision is exemplified in his direction of the Parc du Sausset project, where he oversaw the transformation of 200 hectares of disused agricultural land into a regional park, with the help of farmers and forest managers on site.

"Designers, project leaders, often have much to say about what guides their projects and what is ultimately realized from them, but testimonies about the act of projecting itself are far rarer—that is, about the full range of energies mobilized, the various modalities, the different levels of elaboration through which its chronology is structured. They deliberately conceal their process, its phases of development, regression, resumption, and completion. I would therefore like to encourage you to adopt an approach that sheds more light on the undertaking itself than on its outcome."

Extract from Michel Corajoud, *Letter to landscape students*, 2000[15].

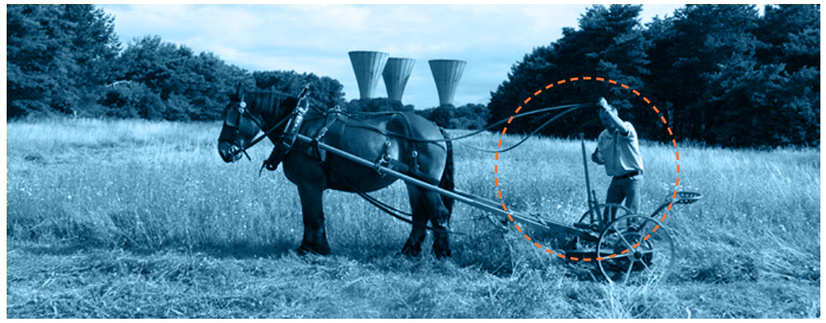


Photo of Michel Corajoud testing horse-powered mowing in the Parc du Sausset, 1981. Source: Website of Michel Corajoud.

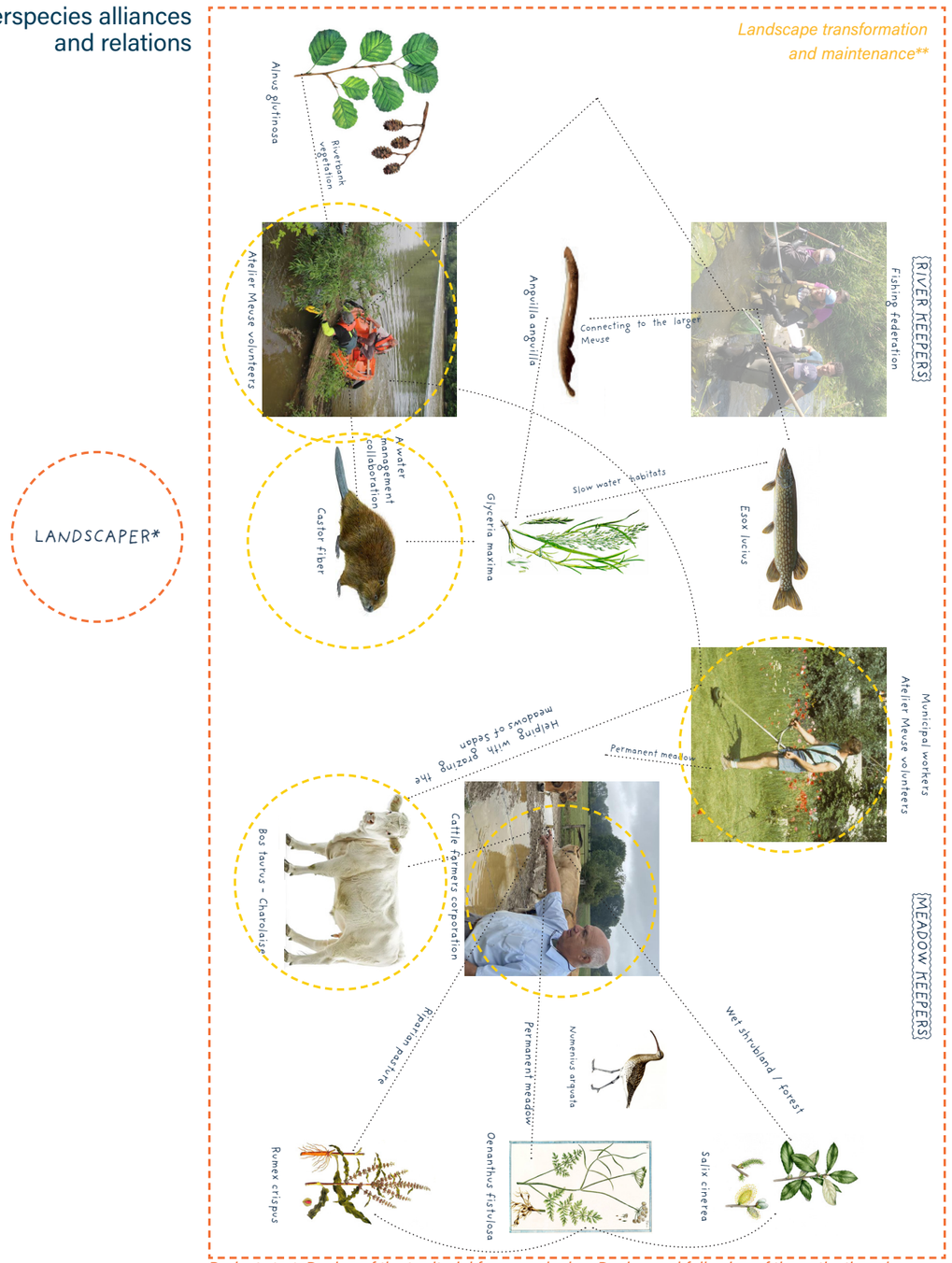
In the Atelier Meuse, the landscaper is the catalisator of a spatial and social transformation process, together with other planning professionals (the urbanism departement of the municipality of Sedan, or civil engineers of the water authority for instance), and experts in social design and participation trajectories.

The large scale of the territory, of 600ha, requires an animation of the preliminary activities aimed at enhancing a sense of *belonging to the territory* in its actors. This task would be hypothetically performed by the Atelier Meuse project Stewards. The creation of this variable number of employments over time ensures a stability in the the drive of the territorial project. Its realisation is in fact based on the engagement of existing actors (farmers, municipal workers and local associations principally) to realise the landscape transformation within the territorial design drawn by the landscaper. Other species, "ecosystem engineers" such as the beaver and the cow, also contribute to the modification of the landscape within this flexible framework. The role of the public, variable over the seasons of the project, is active in building pilot projects, under the coordination of the Atelier Meuse Stewards, who develop a profiency in the dynamics of the landscape. The idea is that by learning through action, and with the instruction of experts, these stewards gradually take over the coordinating role of the landscaper after the activation phase of the territorial project.



A Steward of the Atelier Meuse at work, teaching a school class how to weave a willow fence. Photo: Chifoumi.

Interspecies alliances and relations

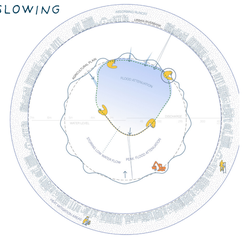


Project start, Design of the territorial framework plan, Design and following of the activation phase

Some of the new alliances that form for and through the territorial project of the Atelier Meuse.
Within the design framework of the landscaper, a high degree of reedom is kept for the actors that actively modify this *taskscape,* throughout the seasonal calendar of the project (next page). The key transformers and mantainers are highlighted in yellow, with the other actors being key species that represent the goaled habitats of the territory and their respective ambassador species.
*the landscaper is not exclusive in its spatial design task ** external contractors intervene for large, one-time transformations

Relational values

SLOWING



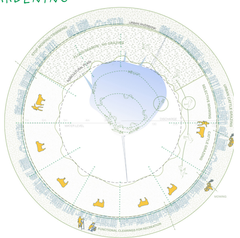
Slowing the river flow to mitigate floods downstream and create new habitats,
keep as much water in the territory

How?
-Remeandering the Meuse in the agricultural plain, making it an attractive habitat for beavers that pursue this task further. The river becomes rich in diverse habitats for species like the pike and the eel (supression of weir in the city center).

-Widening the summerbed before and at key bottlenecks in the urban area.

Who takes part?
-Landscaper in collaboration with engineers of water authority, beavers (*Castor fiber*), Atelier Meuse stewards, public.

GARDENING



Gardening as a collective, interspecies maintenance philosophy of the river edge and the meadows of the floodplain.

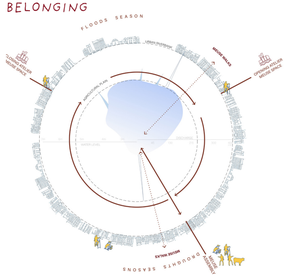
How?
-Enhancing the tree structure creating a flexible landscape framework

-Climatic adaptation of key plots in the city, to improve the sponge capacity of their soils and enhance their social and biodiversity value (community gardening, orchards, nursery)

-Value and expand biodiverse pasture land in the plain, designate urban grazing areas, retard the start of the grazing season to create habitats for breeding birds.

Who?
-Landscaper, Municipal landscape maintenance service, farmers and cattle, Atelier Meuse stewards, public.

BELONGING



Belonging as territorial place-making, towards new river hotspots and interfaces, and (slow) mobility in the floodplain territory.

How?
-Reactivation of disused industrial manufactories (including permanent activation of the Atelier Meuse headquarter),

-New slow mobility path system with transversal and longitudinal connections in the floodplain.

-Programming of the events of the Atelier:
yearly assembly, Meuse walks etc.

Who?
Landscaper, all previous actors.

3.2 Territorial plan

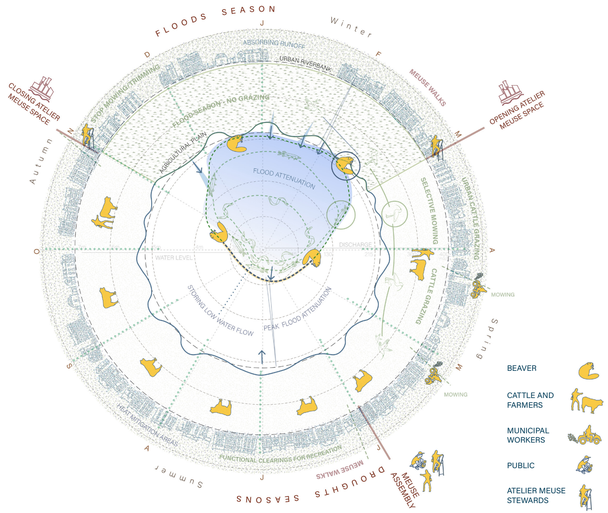
Atelier Meuse design calendar

The general design calendar of the territorial project is a simplifcation of the variety of events, practices and encounters made possible by the three design values throughout a typical year in the life of the species dwelling the river and the floodplain.

The calendar shows how the articulation of the main seasons of the river rhythm (floods season, droughts, and those in between) are made explicit to the actors, including the public, by programming and attuning o the territorial strategies to them.
The Atelier Meuse headquarter opens symbolically at the end of the floods season, when the mowing and grazing activities are retrieved both in the city and upstream. The Meuse assemblies happen at the beginning of June, when the critical period of the droughts begins, to discuss among other aspects the yearly planning of the climate adaptive test plots. This is the central public event in the calendar, alongside guided Meuse walks that facilitate a discovery of the floodplain for its own inhabitants.

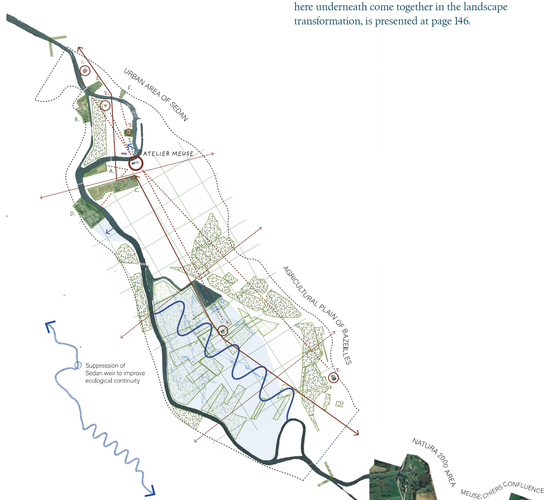
The slowing strategies are aimed at adapting to the extremes of the river rhythm through keeping as much water possible in the upstream plain. In the droughts this is useful to keep the groundwater level sufficiently high, and during extreme precipitation periods it helps in retarding the flood towards the center of Sedan and its exposed urbanised areas.

Gardening focuses on valuing and expanding the existing meadow landscape, expanding this quality to the urban areas, within a "green' framework of trees.



The three design values on this spread, that characterise the spatial framework of the plan, are explained in the following pages of this section.

The phasing of the territorial plan, in which the strategies here underneath come together in the landscape transformation, is presented at page 146.



Strategies of the territorial plan



Design values

Possible new riverine practices

SLOWING



- Damming — BUILDING A BEAVER DAM**
- Storing — DIGGING A RAINWATER BUFFER***
- Playing — PLAYING IN THE RIVER SEDIMENTS***

GARDENING



- Planting — PLANTING A NEW TREE IN THE FLOODPLAIN*
- Diversifying — CARING FOR RIPARIAN VEGETATION*
- Maintaining — PLANTING AND MAINTAINING* A FLOODABLE ORCHARD
- Grazing — GRAZING THE FLOODPLAIN MEADOW*

BELONGING



- Gathering — GATHERING WITH THE RIVER***
- Exploring — WALKING, BIKING ALONG THE RIVER FLOW*
- Making — BUILDING FURNITURE* FOR THE FLOODPLAIN

The range of possible riverine practices made possible by the project, creating different kinds of relations between the actors of the project and the river itself. Relation with the typology described in Chapter 2.

***Direct relation with the river water
**Relation through a waterwork
*Indirect relation to the river

Slowing

A radical remeandering project

The most radical ambition of the *slowing* value of the design, involves the remeandering of the Meuse channel in the agricultural plain upstream of Sedan. This strategy aims at slowing the water flow in all seasons, both to let the river flood prevalently the upstream plain instead of the built up neighbourhoods, as well as to keep as much water possible in the territory when discharge levels are low. This effect would need a water flow simulation in order to measure the actual consequences on the flood dynamic of the Meuse.

The process, probably costly and requiring heavy machinery, is nevertheless imagined to incorporate a part of public participation in its construction, focused on the activation of a disturbance process of the new channel and its sedimentation, to became an attractive environment for beavers dwelling the new river meanders. A pilot project, involving the first couple of meanders of the projected new channel, explains this at page 162.

The design process of a meandering channel section for the Meuse in this part of the Atelier Meuse has been helped by the study of a reference project[16] (right). Despite its scale being different, studying this project helped with consolidating the objectives and procedure of a similar undertaking. A morphological study of meandering sections of the Meuse upstream of Sedan complements this reference.



Engineers gathering at the site of remeandering project in Schotland.

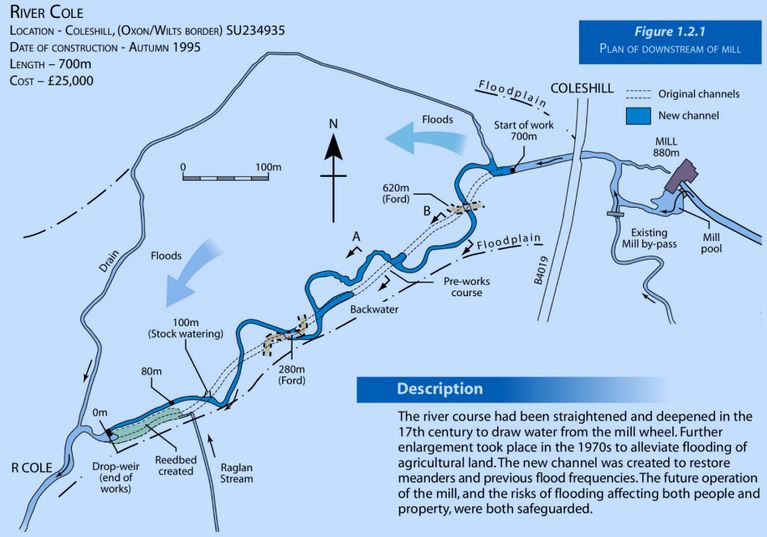


Beaver dams on the Meuse, 100km upstream of Sedan



Morphological study of upstream, meandering sections of the Meuse

Reference project[16]



Cole River restauration project
Keeping the original length profile inclination, but increasing the length, and storage capacity of the river. In this case no pioneer vegetation was planted, and after two years the slopes were rather empty.

Natural Water retention measures, European Com.
By expanding the functional river area, re-meandering allows a slowing of runoff on the shores of rivers, therefore allowing increased storage, especially if the vegetation cover and the associated soil properties are prone to favour this storage.
Store River Water Medium Increase of the stream length and reconnection of old meanders increase the storage capacity of the river.

If the action of re-meandering locally leads to vegetation development, thus it can have an impact in increasing evapotranspiration. This is closely linked to the time necessary for the development of the different vegetal strata (from 2 to 30 years, depending on the distance to the river).

Meanders create wet environments supporting infiltration and ground water recharge.
By modifying land cover and sometimes removing legacy sediment, re-meandering can change soil capacity retention.
Re-meandering provides habitat for species such as aquatic plants, otter, salmon, insects and birds, fish, macroinvertebrates, macrophytes and phytoplankton, and kingfishers.
The existence of hydraulic annexes, quiet water areas or wet lowlands that can be created by the dynamics of meandering, improves the preservation and resilience of ecological communities and habitats.
The modification of the erosion process also affects the quality and habitat diversity of benthic fauna and fish, as well as riparian species.
The first positive impacts of re-meandering habitat, fauna and flora are visible after about two years, including riparian forest.



© Environment Agency



NOT DEFINITIVE LAYOUT.

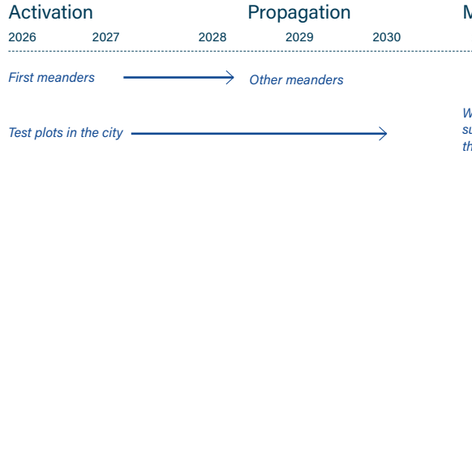
Design alternatives and other slowing strategies

Two different variations on the remaindering strategy were drawn, one with a double channel and the other with the filling of the former channel with the gravels excavated for the new one.

The latter was chosen for its symbolic value, changing the course of the river towards the paleo river channel were it once run before its canalisation. Another argument was the creation of additional slow water habitats with the branching of lateral streams to the new areas of backwaters.

The Slowing approach of the territorial design also projects the widening of the summerbed in key spots in the city where there is a bottleneck in the river outflow. These are also surfaces in disuse (industrial friches), where demolition of existing buildings could favour this strategy.

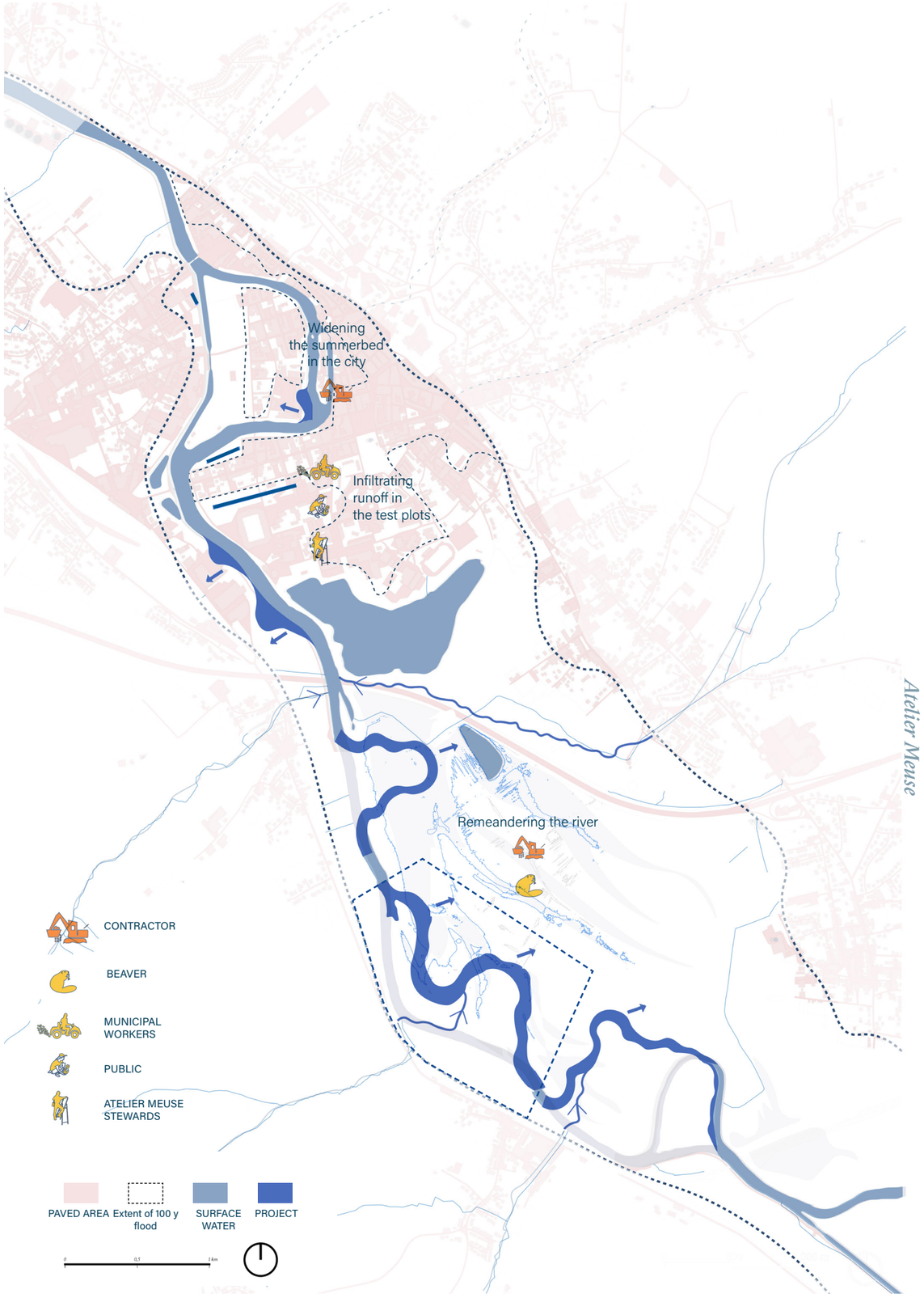
Also related to the slowing of water, aimed at precipitation runoff, is the creation of wadis in Sedan, in three plots suited for climate adaptation projects.



Option 1. Double channel, widened with central mound

Option 2. New channel, cut and extra fill on the old channel

Design options of the remeandering strategies



The three strategies of the Slowing approach of the territorial design. The remeandering of the river and the slowing of runoff in the city are to prioritize compared to the widening of the river channel in Sedan, requiring a slower preparation process.

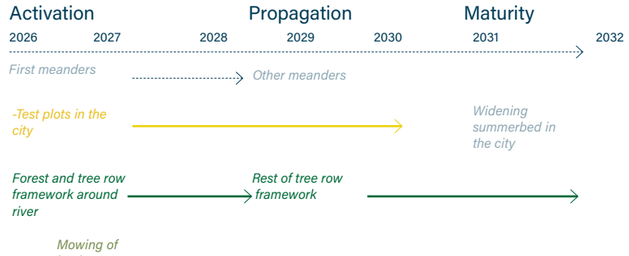
Gardening

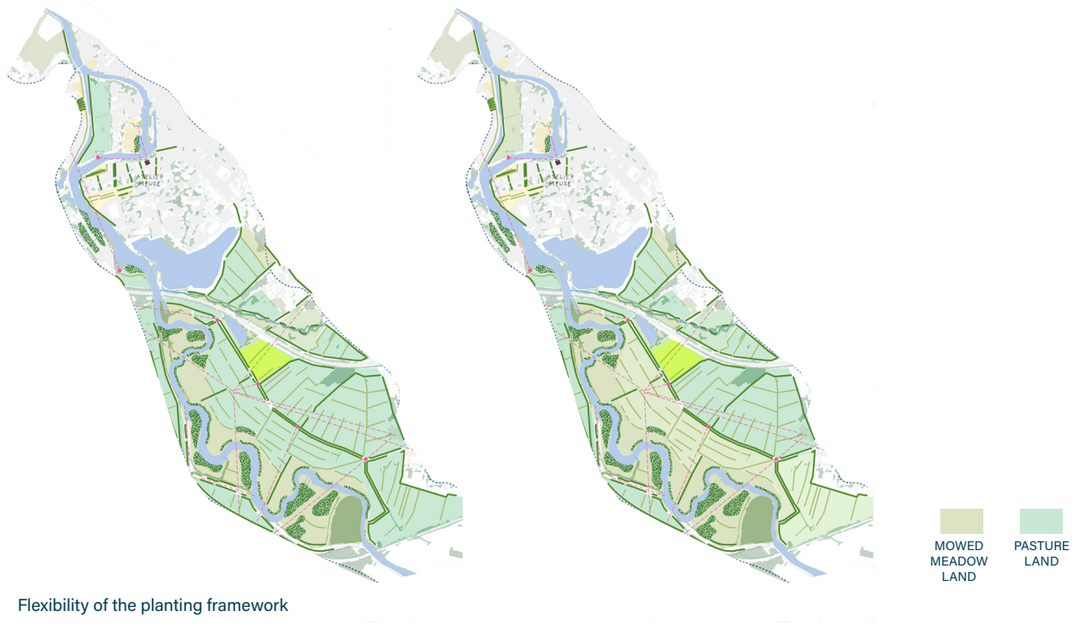
Planting and mantaining between the tree lines

Gardening is understood as a collective and interspecies maintenance practice, shaping both the river edge and the floodplain meadows as porous, biodiverse and socially valuable environments.

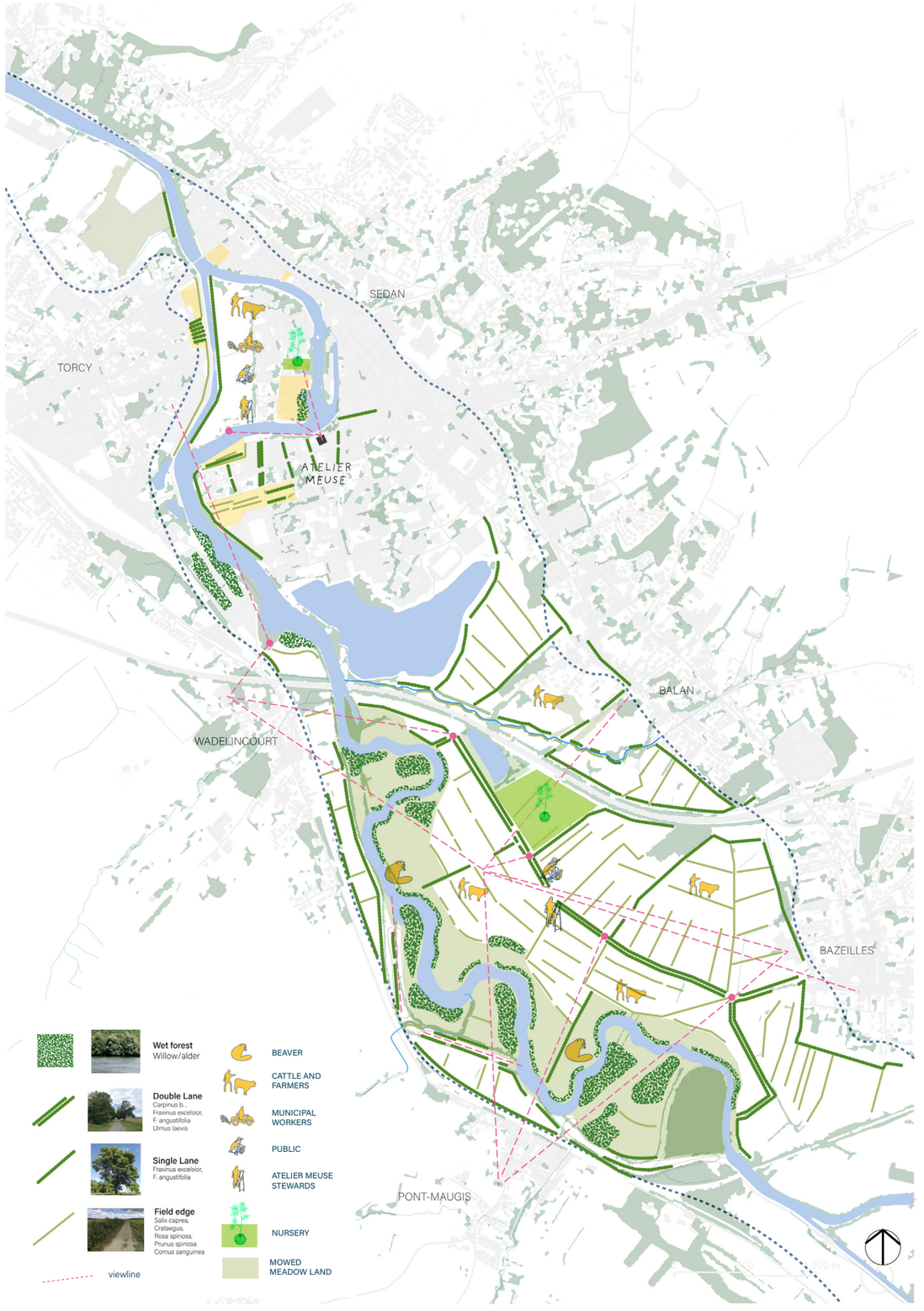
A tree planting framework is the overarching planning intervention by the landscaper, allowing most of the plots in between to be mantained in different ways. Two nurseries, one in the city and one larger upstream are activated in the start of the territorial project for tree and shrub species to be grown in. Farmers, municipal workers and the public in special events contribute with planting the tree framework gradually.

In the key urban test plots, disused parkings, lawns and climatic adaptation is tested through a transformation of the soil done by community projects: gardens, orchards, and nurseries operate not only as social hotspots but as spaces for water retention and habitat diversification. In the agricultural plain, a shift in grazing regimes close to the Meuse allows for a transition towards high meadows as habitats for breeding birds in spring. The rest of the plots can be flexibily managed by their owner (below): within this framework one could even imagine a patch of nature reservation on the Torcy meadow in the center of the city.





Flexibility of the planting framework



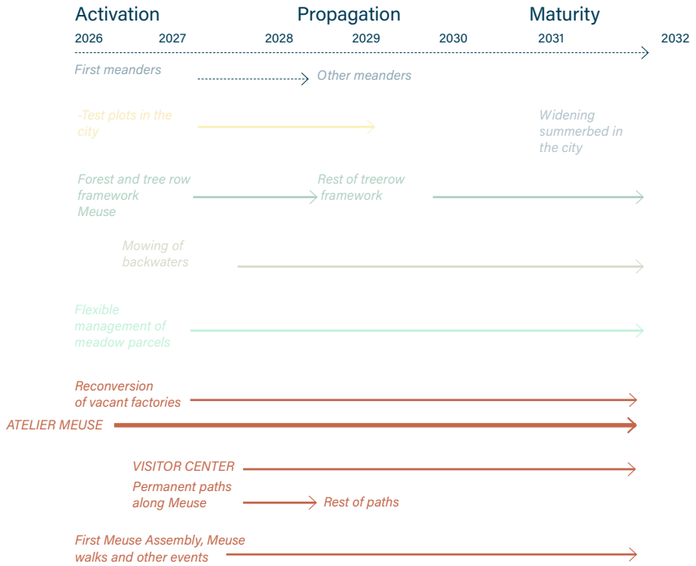
The fixed aspects of the "green" framework of the territorial design. The tree structure, taking in account important viewlines in the territory, is the backbone of all the Gardening activities . The position of territorial nurseries, together with the test plots and the buffer area around the river to manage as biodiverse meadow, are also pre determined by the landscaper.

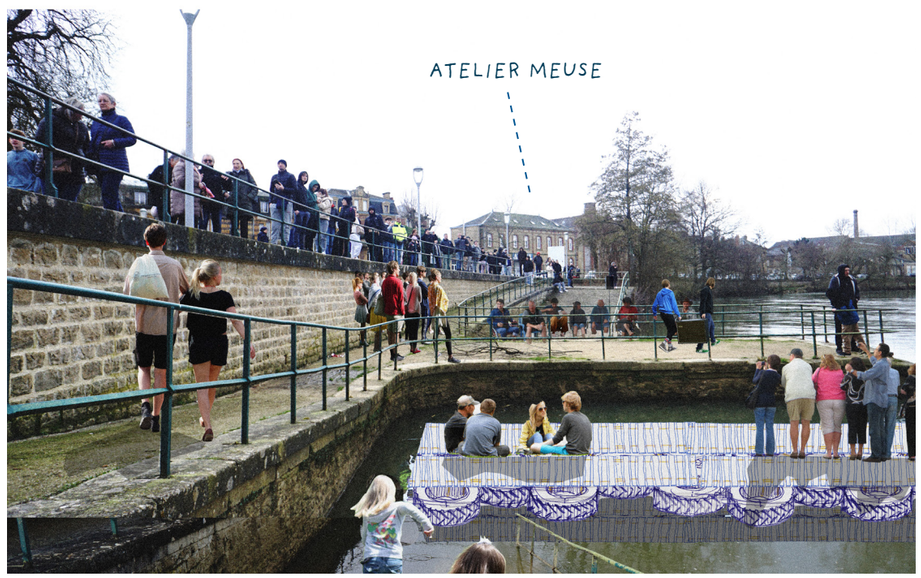
Belonging

Active hotspots, paths, viewlines

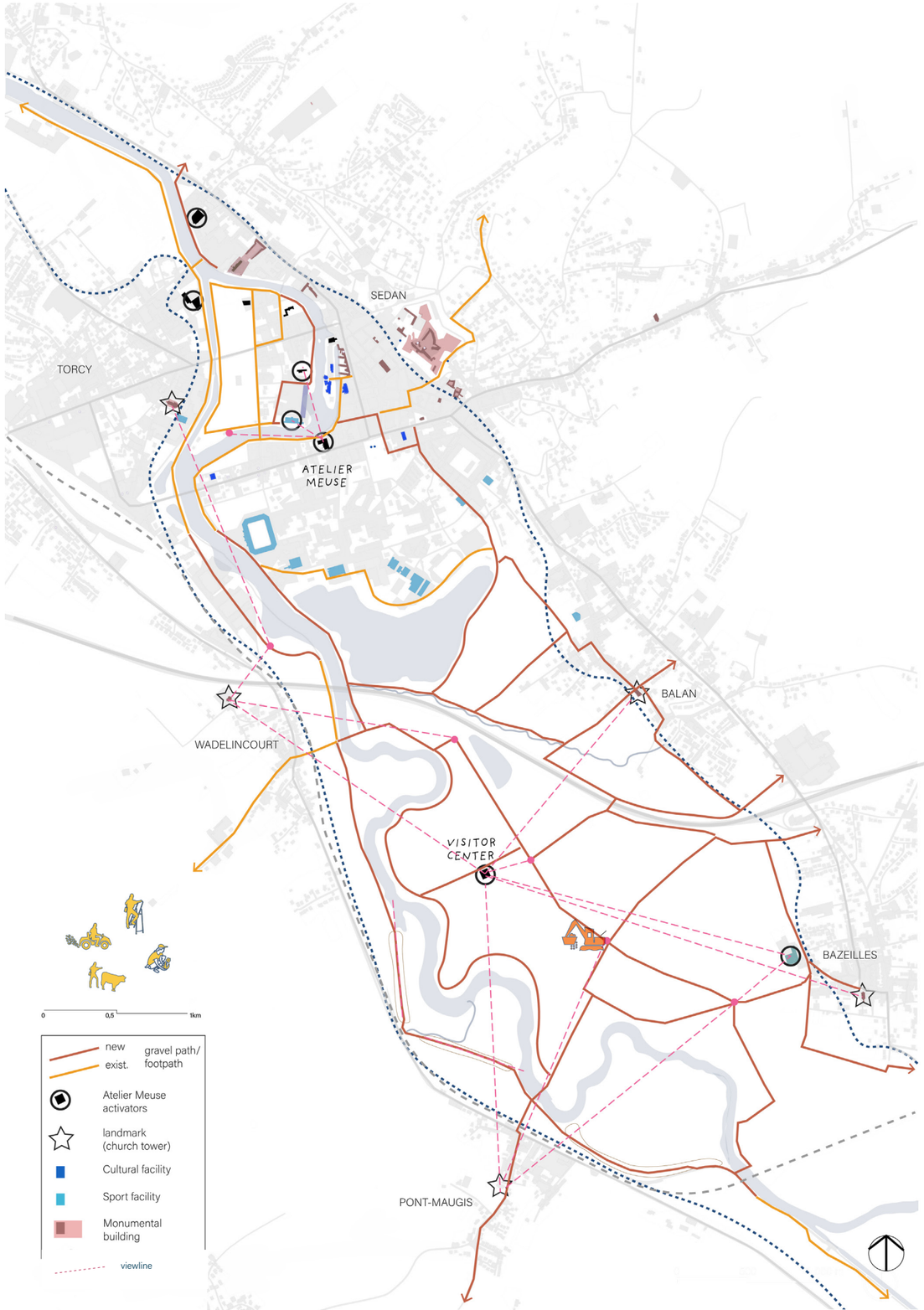
After the activation of the Atelier Meuse headquarter, a series of events revolving around the guided Meuse walks, discussed during the yearly Meuse assembly , are started in the territory. This have all together the objective of creating a sense of belonging to the river and its floodplain both in the city and upstream.
The rehabilitation of abandoned factories in the city ensures that indoor public uses create new hotspots around the river.

A better path network is needed to ensure mobility along the river on both sides of it, and to improve connections across the floodplain between the villages on the edge of the design perimeter.
These paths, gravel-paved, are realised progressively by contractors, with a priority for those along the Meuse itself.
The first Meuse walks in the Activation phase act in this sense as a prefiguration of these ideal itineraries, longitudinal and transversal to the floodplain.





The yearly Meuse assembly

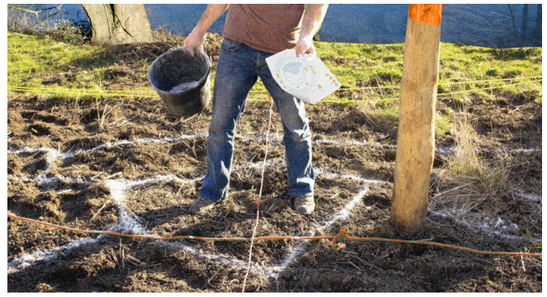


The projected path system of the territory, with more than 30km of new paths to make this now mostly private landscape accessible for people waking and biking through it. The programming of the new hotspots, complementing the existing cultural and sport facilities activates the territory for every human actor to benefit from it.

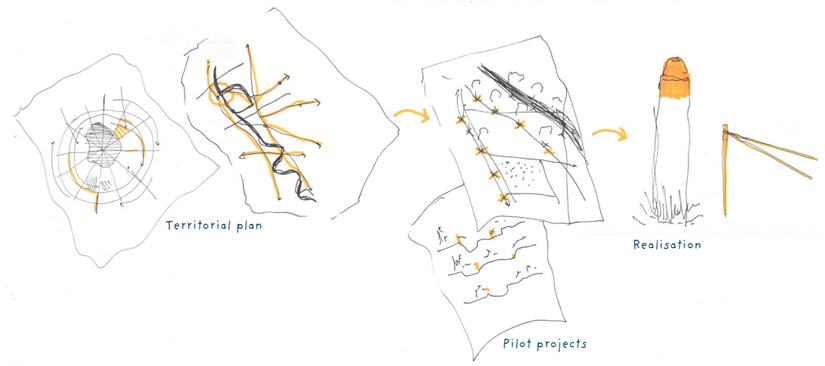
3.3 Territorial plan

A flexible framework: overview and priorities

The three aforementioned design values and related strategies result in a landscape framework intended to progressively carry the varying social, climatic and ecological objectives of the project. On the opposite page, the orange colors indicate the "strong lines" of the project. These include the remeandered river channel as the new backbone of the floodplain, together with the new path system and tree line structure. Within this framework, an evolution of the current floodplain configuration is projected. A new agricultural plot geometry upstream shapes the higher meadows, whereas a bufferzone along the remeandered river is mantained to different degrees of wetland, wet meadow and wet forest (see phased plan on the next page). In the urban area of Sedan, test plots enclosed



From the drawings to the construction of pilot projects of the territorial plan, the landscaper work engages with different levels of abstraction and concreteness.



The spatialisation of the framework at different stages of the project.

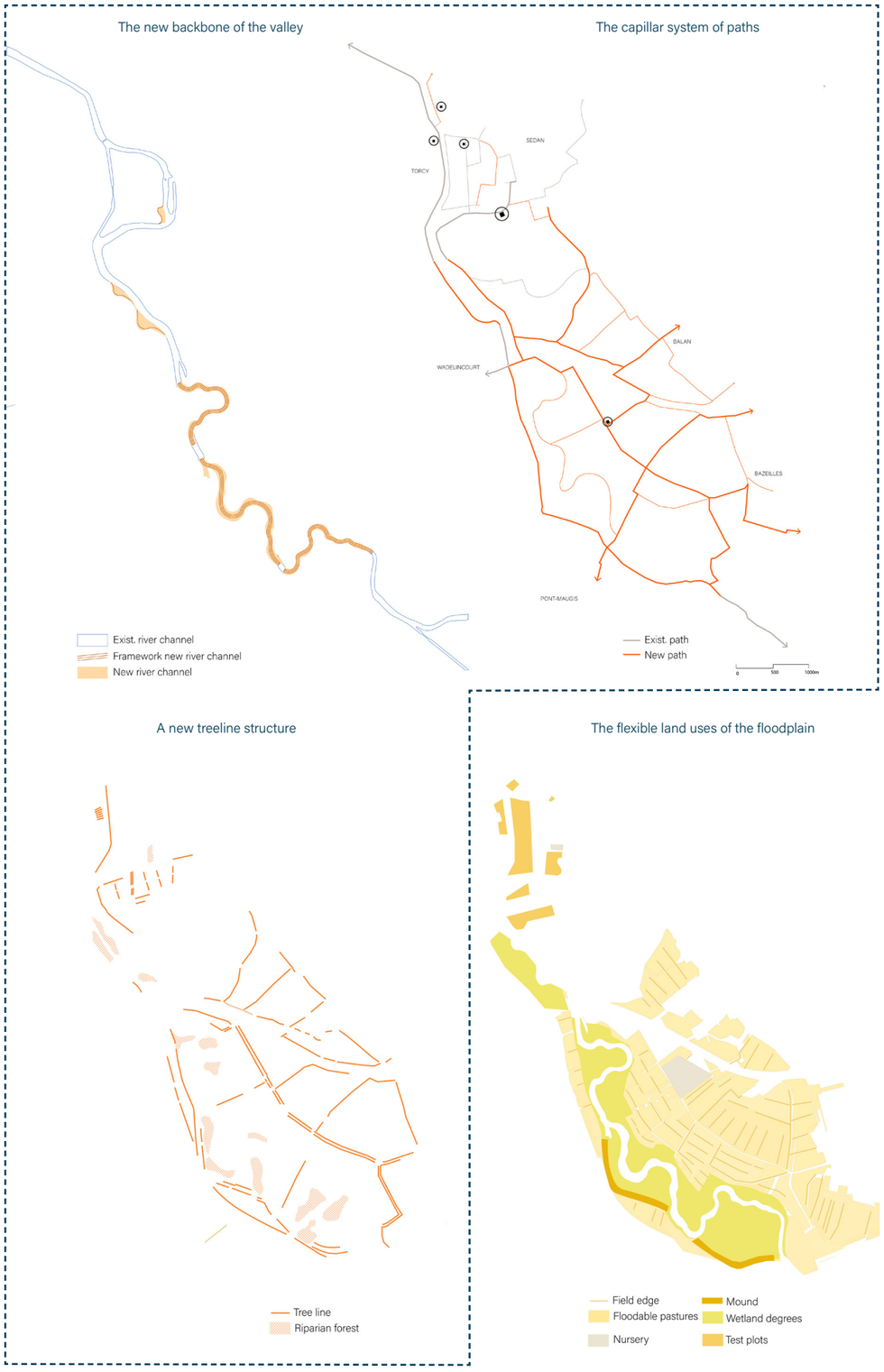
and connected by the framework, are the site of climatic adaptation and diversification of current flood expansion zones to a typology of community gardens and orchards.

Pilot projects

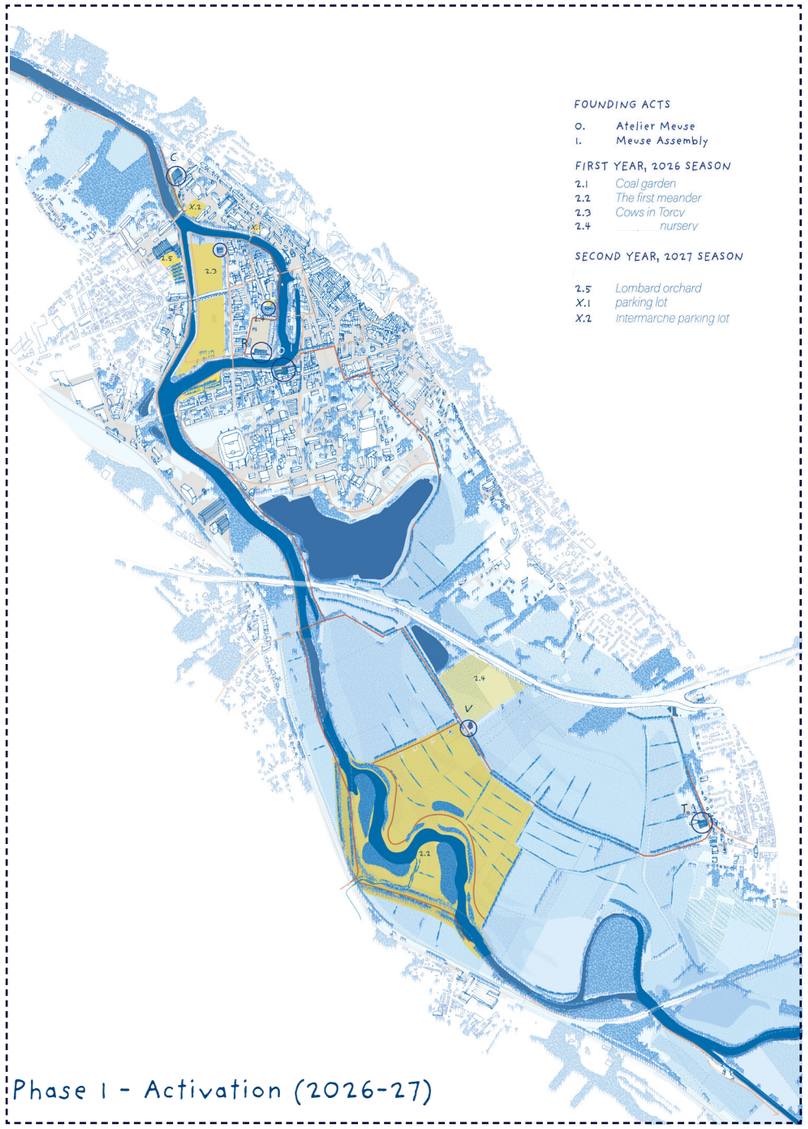
The framework is progressively worked out through to smaller scales by the landscaper, and realised in relation with pilot projects both in the upstream plain and in the city in the test plots. Here the framework determines not only the boundaries of the experimental landscape design projects, but also the most important (view)lines on the plots themselves.

In the city of Sedan, together with general planting rules and reccomandations about the maintenance process of the plot, this framework is freely interpretated by the association that takes over the plot.

In the case of the agricultural plain and the river remeandering project, the framework determines the most important measures of a more technical, larger design. The landscaper undertakes the design of the new river channel(s) with the aid of a civil engineer from the local basin authority.

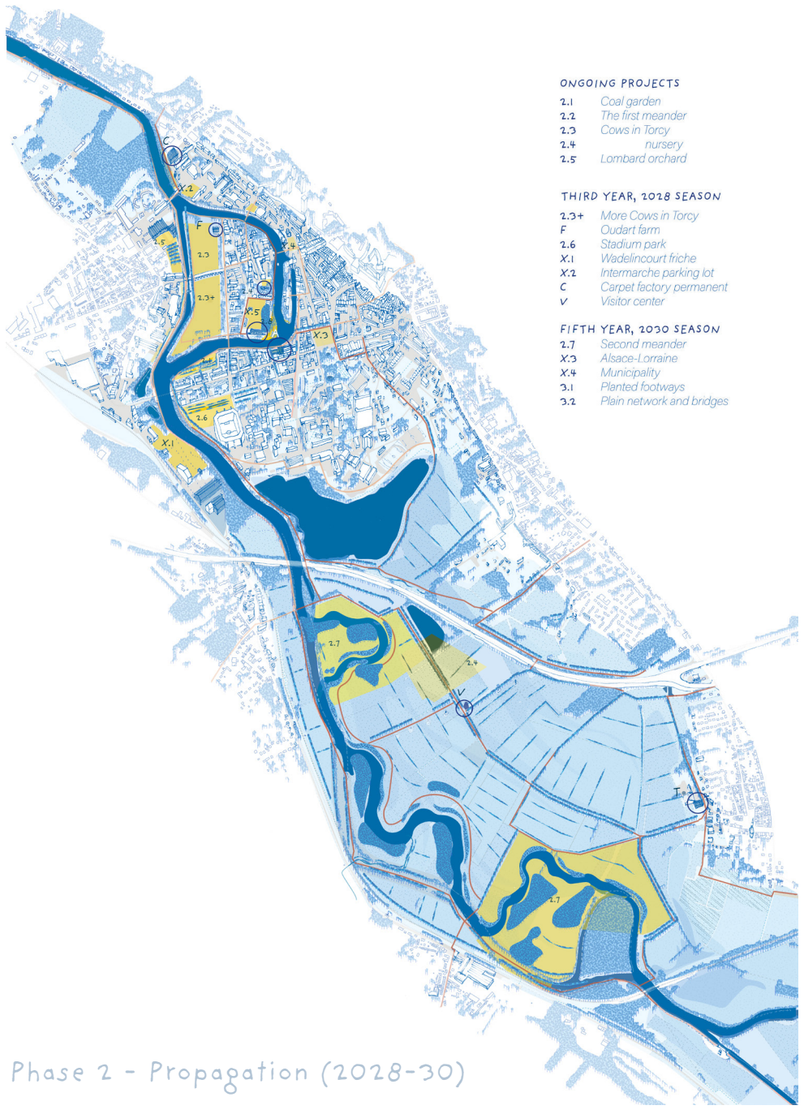


Phasing of the territorial plan



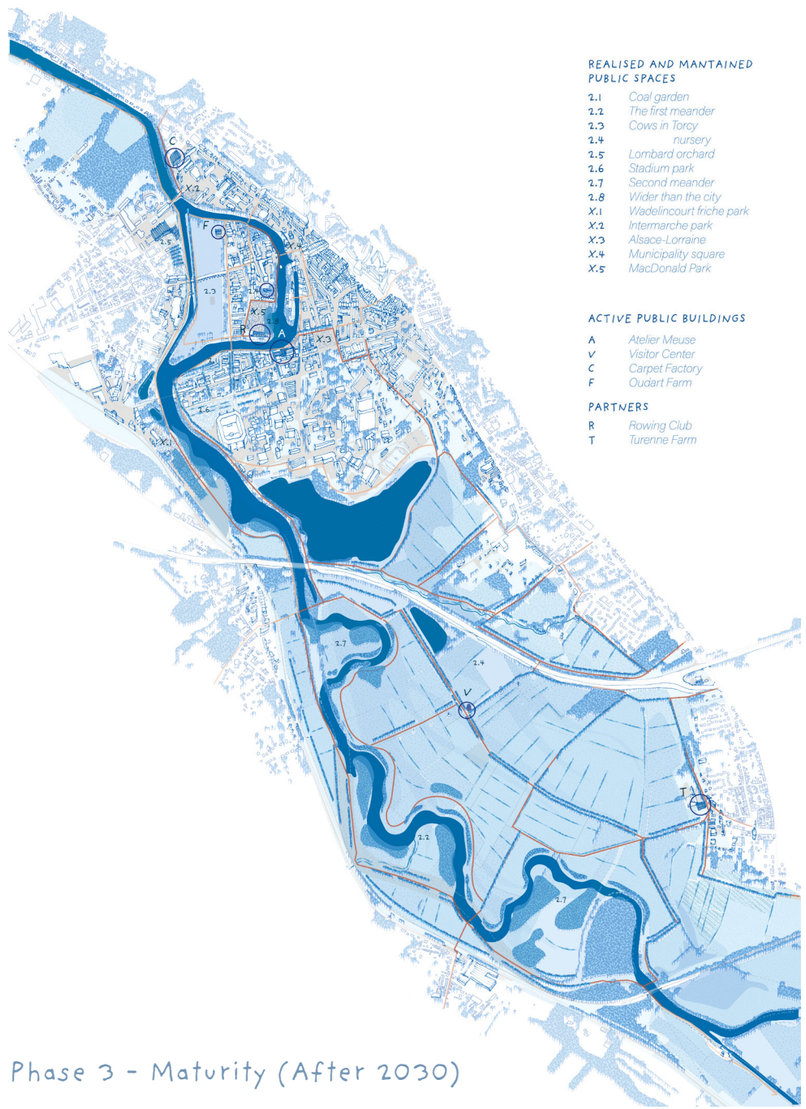
Phase 1 - Activation (2026-27)

During the activation phase of the plan, lasting two year cycles, the city center of Sedan and a central area in the agricultural plain are brought in connection by new paths. The first Meuse Walks are organised to bring citizens to the knowledge of the transformation of their territory through these pilot projects. In the city, the municipality makes a call for interest for local associations and links these with the Atelier Meuse (design) consortium. Upstream, the basin authority and the Ardennes Metropole region make funds available for a first test part of the remeandering project. At the end of this phase, the initial contract of the landscaper comes to an end.



Phase 2 - Propagation (2028-30)

The projects in the city multiply, with the experience of the first test plots. A number of industrial buildings are now stable hotspots in the urban tissue, making the riverbanks attractive and connected. The fully realised path network now connects the plain, while the other meanders are being excavated and planted. The stable programming of the Atelier Meuse headquarter makes it an established public institution in the city.



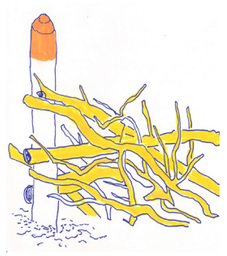
Phase 3 - Maturity (After 2030)

The last parts of the landscape framework taking more time to be realised, like the widening of the Meuse in a number of areas of Sedan, have been realised. All the projects in the test plots are mantained by local associations. The planting structure is fully realised, along which the different actors of the territory can recreate, encounter each other and access the different plots in which they work. The yearly programming of the Atelier Meuse, with the annual assembly and other seasonal events continues.

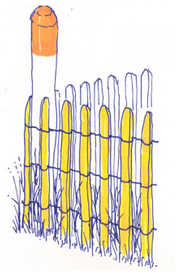
Marking the territory

SLOWING | GARDENING | BELONGING

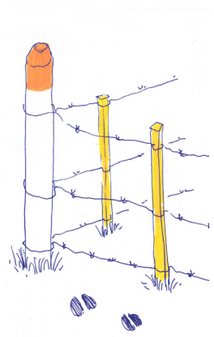
Temporary



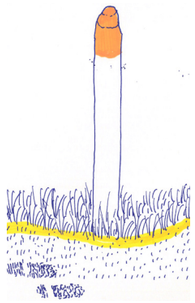
'Framework marker' beaver-like dam



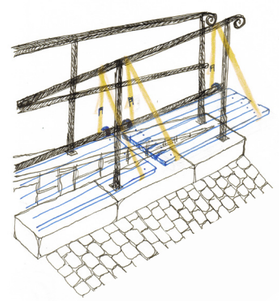
split-stake fence



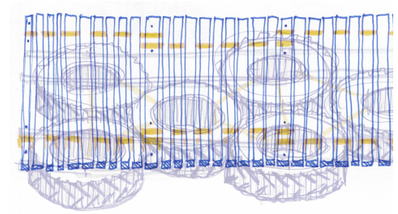
barbed wire



mowed path

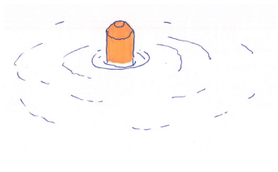


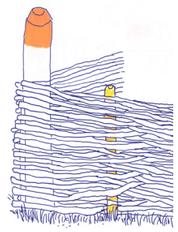
'Meuse assembly' adaptable bench



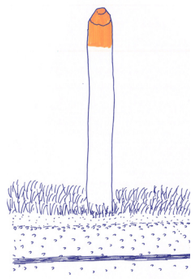
"Pneumatic' temporary pontoon

Permanent

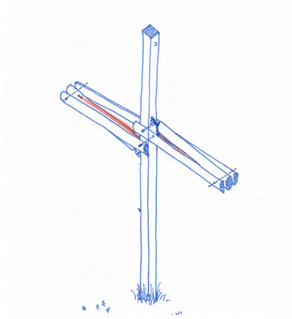


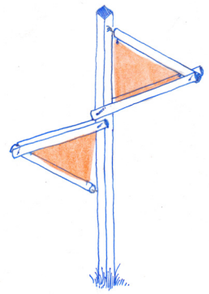


woven willow fence



gravel bikepath

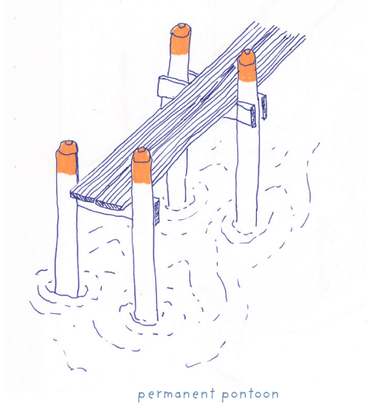




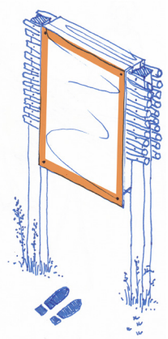
'High Meuse'
Adjustable water height signage on paths

During the Activation phase, the tangible expression of the territorial plan's framework comes alive in the floodplain landscape. This catalog is an overview of the different objects drawn by the landscaper (orange), whose position is determined by the important lines of the design. The 'Framework marker' is the basic element of the design: it marks the emplacement of paths, fences, and other temporary objects built or mounted by the different actors of the territory (next page).

Made with local alder wood, these poles, together with other territorial furniture elements like temporary pontoons or permanent information panels, are workshopped in the Atelier Meuse headquarter.



permanent pontoon



'Panel'



Adapted from a photo of the Atelier Ourse.



In the test plots, municipal workers, associations and inhabitants at work to build the biodiverse hedge of a community garden.



Temporary construction lines on the site of the river remeandering.



The split stake fences installed by an association licensed to rewild a section of the Meuse bank in Sedan.



The cutting of alder wood preliminary to the construction of beaver-like dams on the new channels of the Meuse.



Anti-erosion mesh installed by the public on the outer bank of the meanders to prevent a too quick erosion process. The bank is further stabilised by willow branches, that will become a riparian forest.



Dam building by the public to create disturbances in the uniform, bulldozer excavated channel. The place of the supporting poles is determined by the lansdcaper, in straigher sections of the new meandering course of the Meuse.

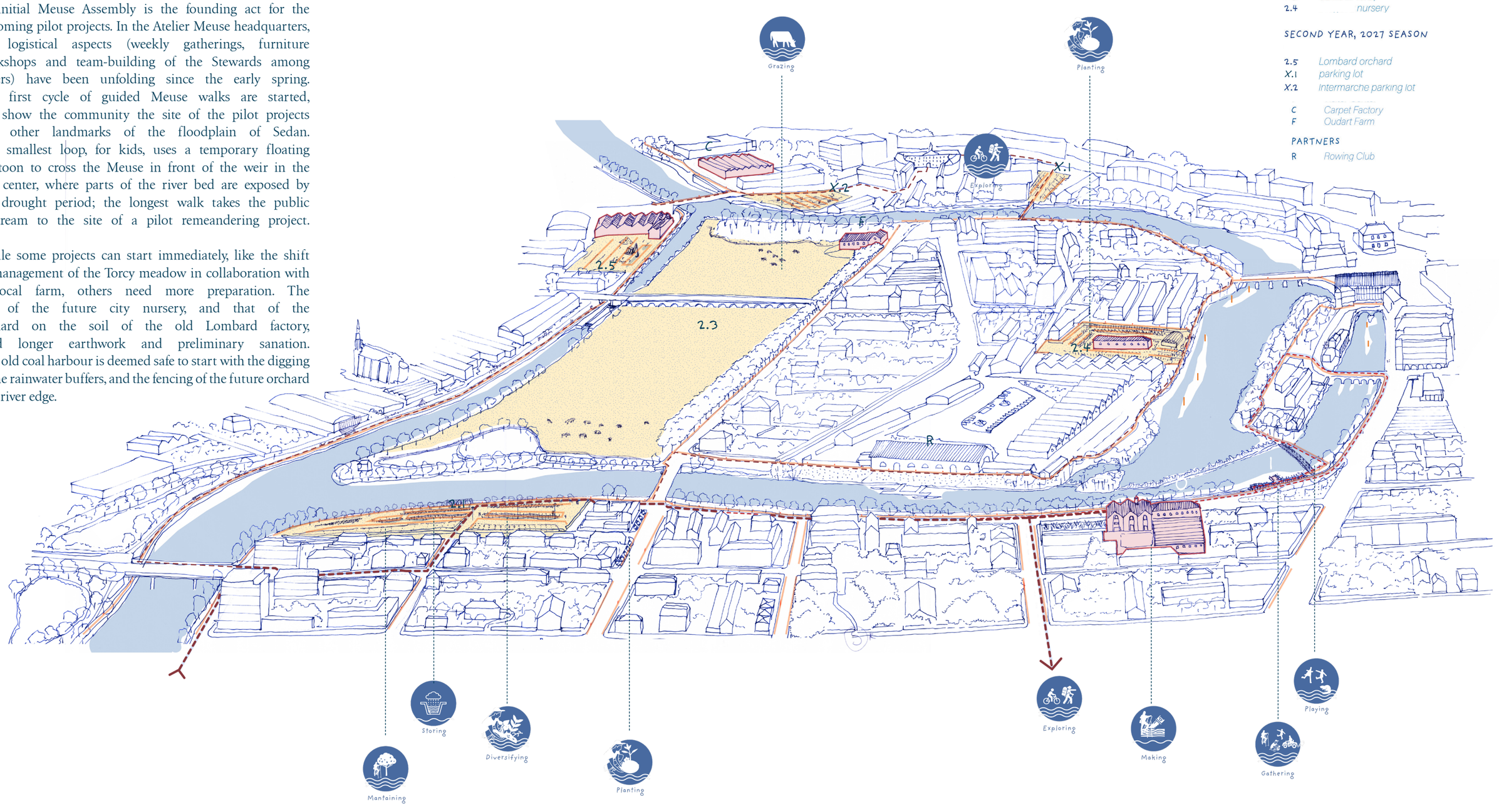
3.5 Pilot projects

Sedan city center

June 2026

At the start of the first summer of the Activation phase, an initial Meuse Assembly is the founding act for the upcoming pilot projects. In the Atelier Meuse headquarters, the logistical aspects (weekly gatherings, furniture workshops and team-building of the Stewards among others) have been unfolding since the early spring. The first cycle of guided Meuse walks are started, to show the community the site of the pilot projects and other landmarks of the floodplain of Sedan. The smallest loop, for kids, uses a temporary floating pontoon to cross the Meuse in front of the weir in the city center, where parts of the river bed are exposed by the drought period; the longest walk takes the public upstream to the site of a pilot remeandering project.

While some projects can start immediately, like the shift in management of the Torcy meadow in collaboration with a local farm, others need more preparation. The site of the future city nursery, and that of the orchard on the soil of the old Lombard factory, need longer earthwork and preliminary sanation. The old coal harbour is deemed safe to start with the digging of the rainwater buffers, and the fencing of the future orchard and river edge.



Pilot projects

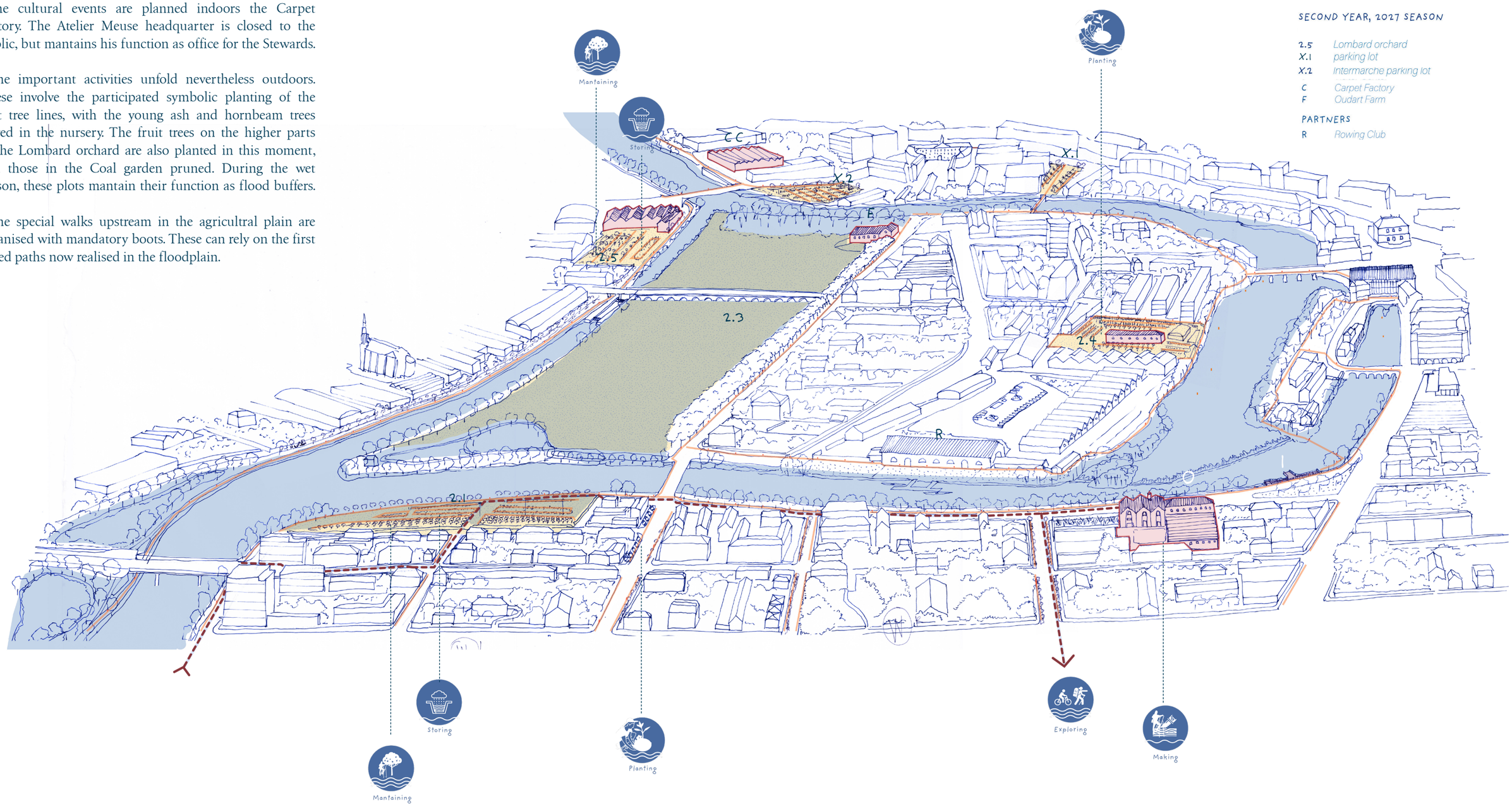
Sedan city center

December 2027

During the second winter of the Activation phase, some cultural events are planned indoors the Carpet Factory. The Atelier Meuse headquarter is closed to the public, but mantains his function as office for the Stewards.

Some important activities unfold nevertheless outdoors. These involve the participated symbolic planting of the first tree lines, with the young ash and hornbeam trees stored in the nursery. The fruit trees on the higher parts of the Lombard orchard are also planted in this moment, and those in the Coal garden pruned. During the wet season, these plots mantain their function as flood buffers.

Some special walks upstream in the agricultral plain are organised with mandatory boots. These can rely on the first paved paths now realised in the floodplain.

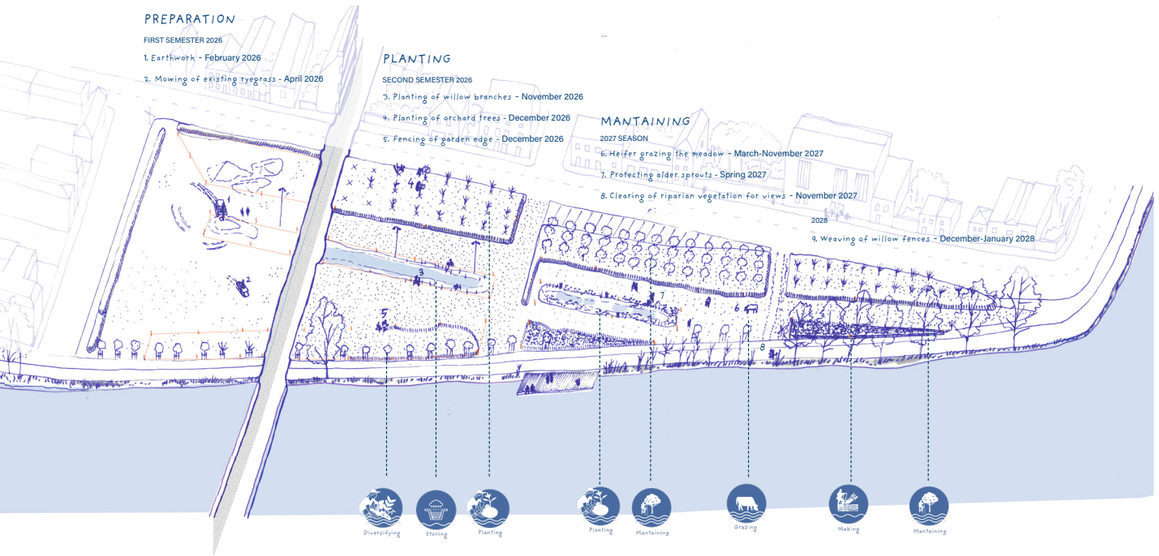


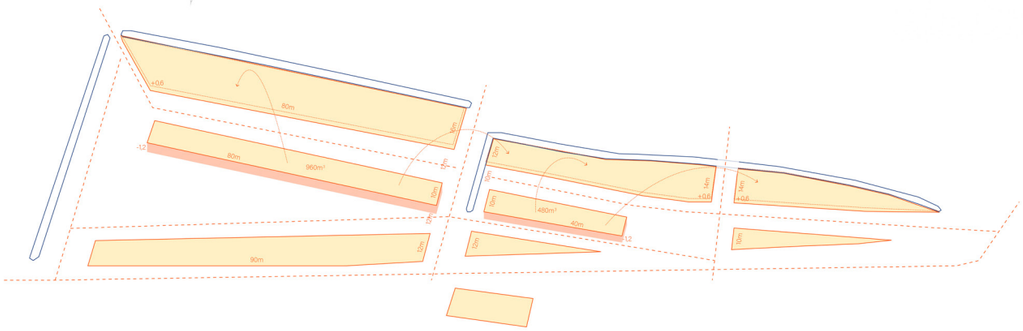
Pilot projects

The coal garden

This small scale project sizing 1 hectar becomes the first realised public space of the territorial project, after its activation in spring 2027. Its programme combines two small rainwater buffers and around 80 apple and cherry trees planted on higher soil next to the existing levees. The main lines of these spaces, within the overall composition of the garden, are set out by the landscaper. An association and the middle school of the neighbourhood are assigned with the realisation and maintenance of the project, under the guidance of the landscaper and a couple of Atelier Meuse stewards.

The riverbank, with first a temporary and then a permanent pontoon, is also gardened by the users, who select perennials through time with the help of fences, to keep in the summer months when most of the meadow is mowed. The plot keeps its current function in the winter months, while becoming an oasis of freshness in the summer.

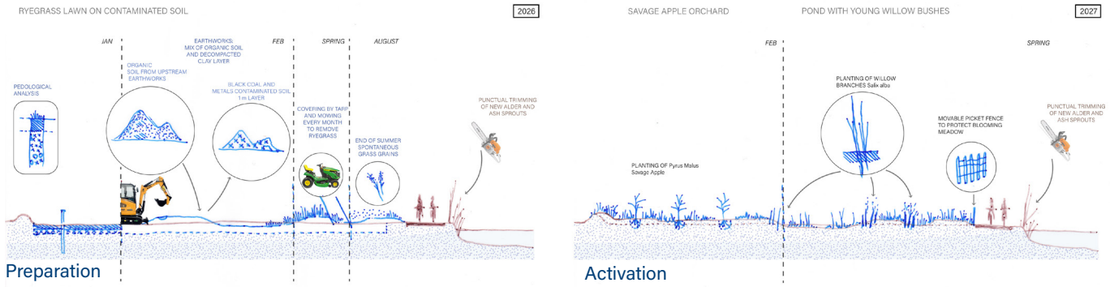




How the landscape framework translates on this scale.

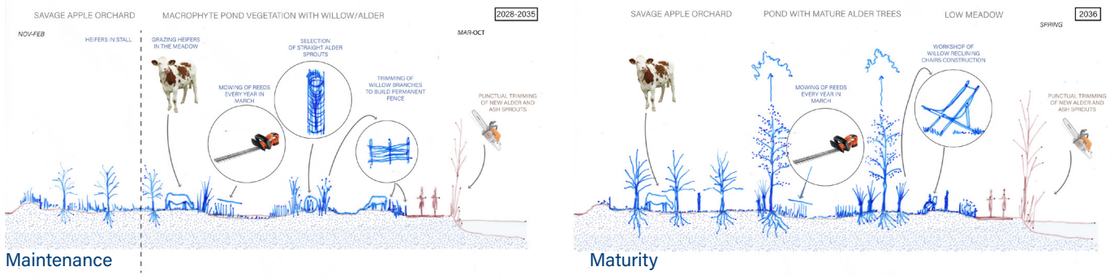


Current situation



Preparation

Activation



Maintenance

Maturity



Activation phase

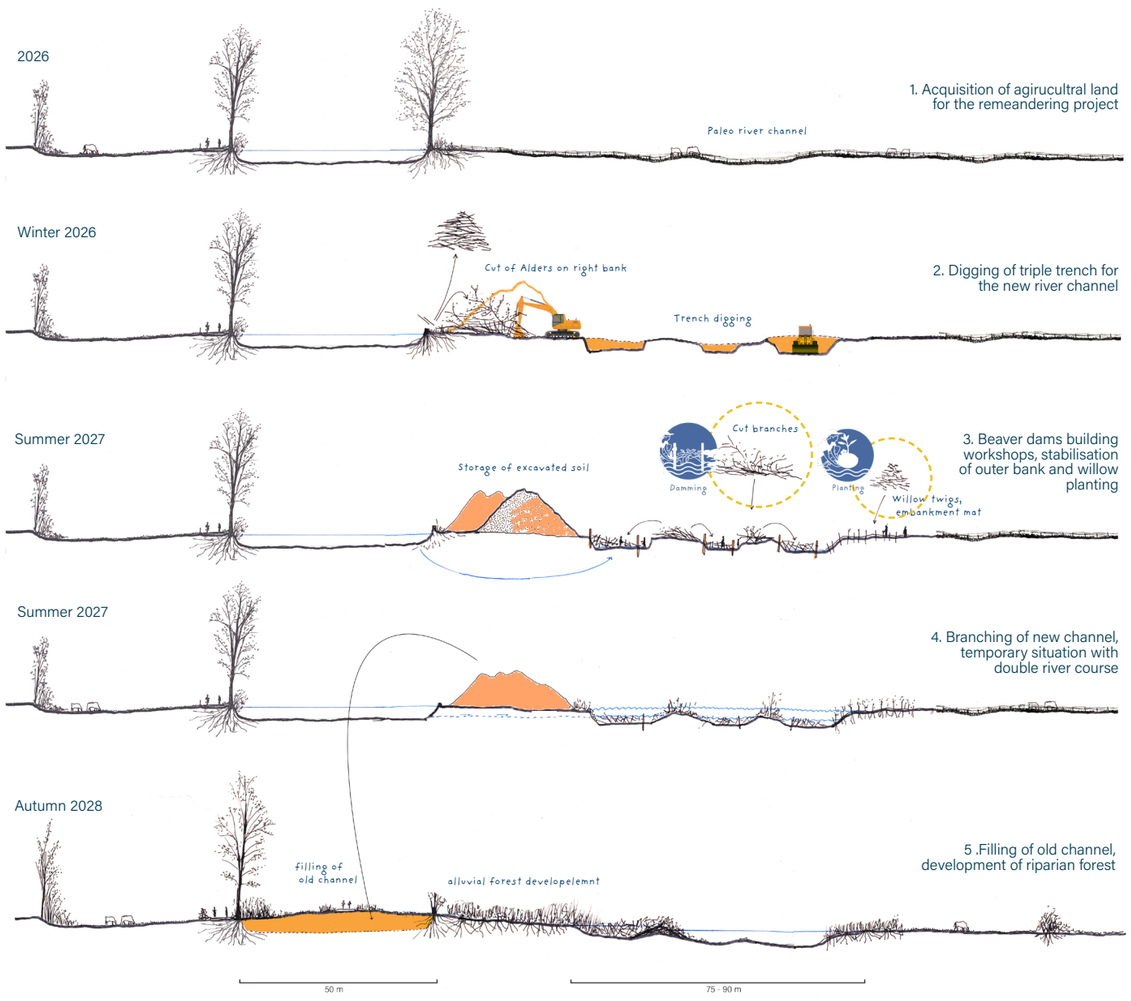
Pilot projects

The first meanders

The pilot project of the upstream remeandering of the Meuse in the agricultural plain starts at the same time as the first activities in the city, with the observation and participation of the public to the construction works. After a preliminary phase of earthworks, supervised and helped in the design by engineers of the basin authority, in summer 2027 a number of weekend events allow the public to be actively involved in the landscape transformation. Some teams build beaver-like dams with branches of the cut trees from the right bank of the current river channel. Others stabilise the outer meanders with biobased mesh and willow branches, planted to accellerate the succession process towards a riparian forest.



Beaver dam, used by this ecosystem engineering species to slow down the water creating habitats with stable food availability. Photo: Mattias Sorg



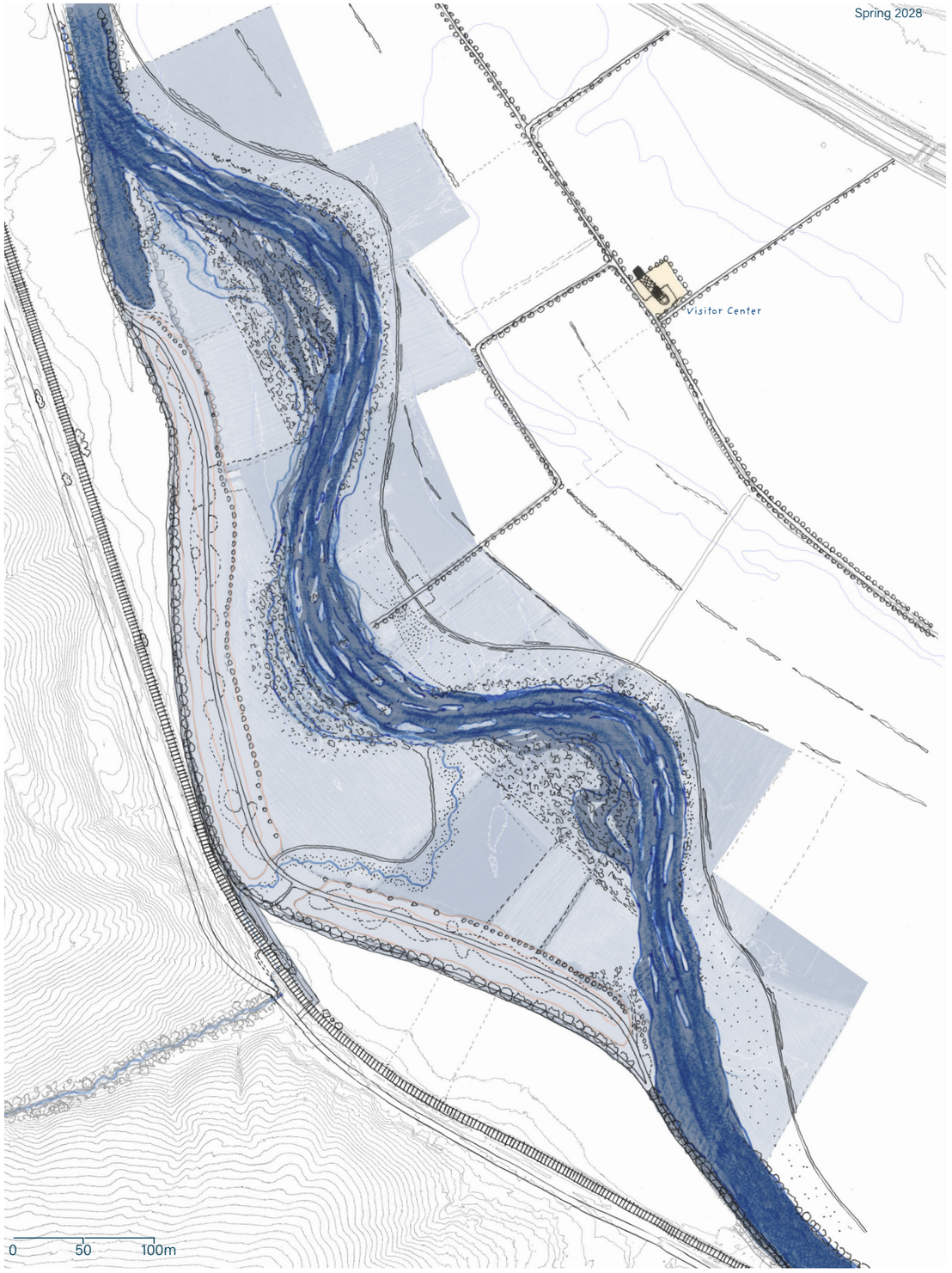
1. Acquisition of agiricultral land for the remeandering project

2. Digging of triple trench for the new river channel

3. Beaver dams building workshops, stabilisation of outer bank and willow planting

4. Branching of new channel, temporary situation with double river course

5 .Filling of old channel, development of riparian forest



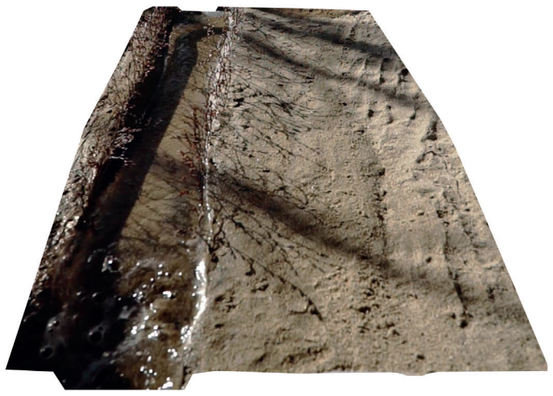
After a phased process of two years, the Meuse in the new meandering channel has a slow, diverse course. In between the three trenches excaveted mechanically, small islands of sediments emerge behind the beaver-like dams. On the old channel, filled-up with the soil from the excavations, a higher path allows for unusual viewing angles on the floodplain.

Testing and assessing

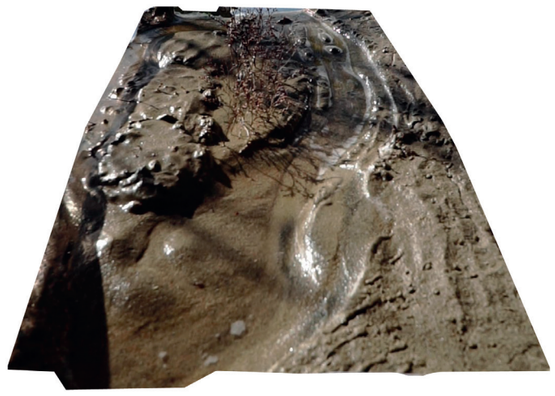
To test the sequence drawn in section, a model was used to observe what kind of sedimentation shapes would appear in the more varied new river channel For this I used a sand model, in a 60cm long plastic box with both shorter sides open, to test a flow of water running through a scale reproduction of the current Meuse channel. By tracing the three channels of the design, I could observe how islands were created by the disturbance of beaver-like dams. The final result, after the “filling in” of the current channel, is a varied river profile with shallow banks.

The recording of a video during the process allowed me to extract stills from it to document the evolution of the river course.

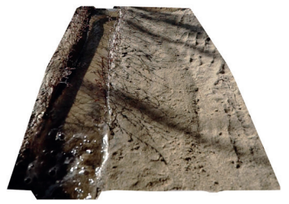




SItuation winter 2025



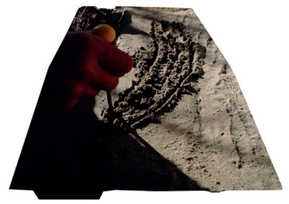
SItuationsummer 2027



1. Current river channel, embanked and stabilised by alder rows.



2. Excavation of first side-channel, partly deepening of paleoriver bed.



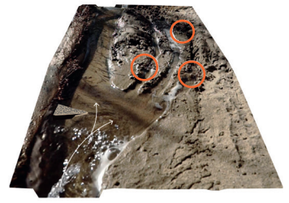
3. Excavation of the three side-channels.



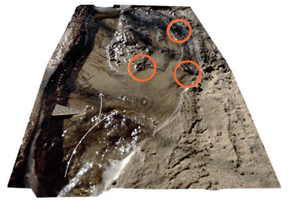
4. Beaver-like dams are built by the public during weekly events that promote participation to the remeandering project .



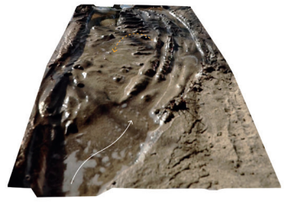
5. The side channels are connected to the river. A temporary groyne partly diverts the flow towards the side .



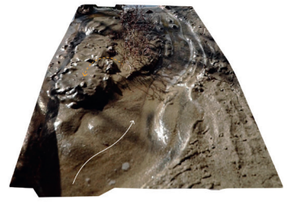
6. The dams create disturbances in the flow, causing faster sedimentation and erosion dynamics.



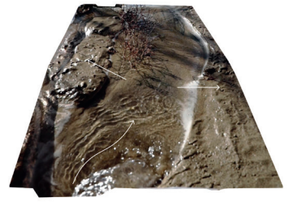
7. At the bifurcation point, the “old” river channel becomes wider .



8. During the summer, the “old” river channel is filled up with the previously excavated sediments.

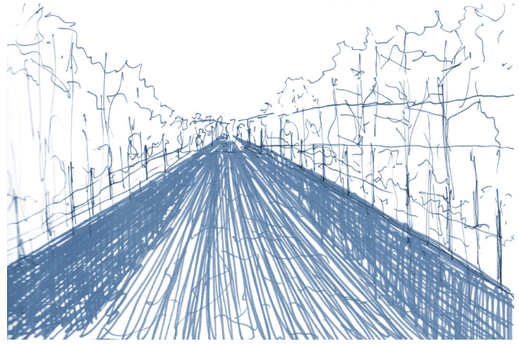


9. On the inner side of the new, slow flowing arms of the Meuse, an alluvial forest can grow freely.

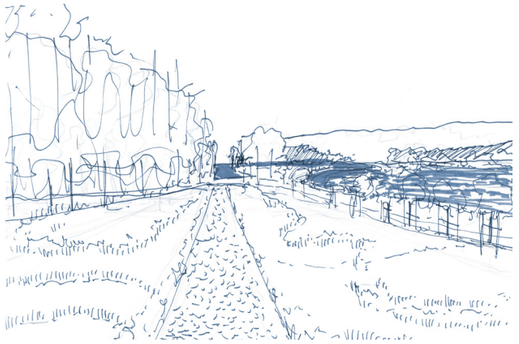


10. Now moved towards the center of its originary floodplain, the Meuse has more space on its sides in case of flood.

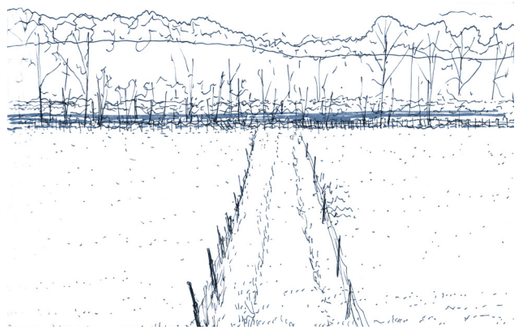
Design sketches



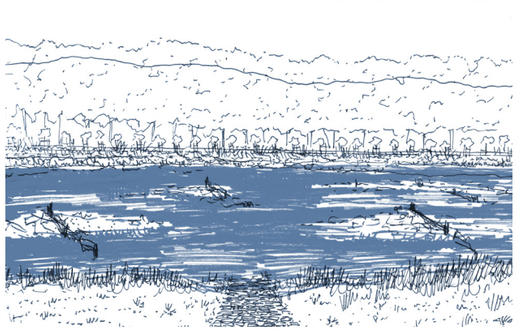
Current river channel: a 50m wide fast flow of water, in a summerbed stabilized by regularly planted alder trees.



Design projection: Filled up current channel, a couple meters higher than the floodplain, creating open views over the valley.



Current floodplain area next to the river channel, a closed landscape.



Design projection: new meandering river channel, parallel to the old one, flowing slowly amidst the disruptions created by the man made dams.

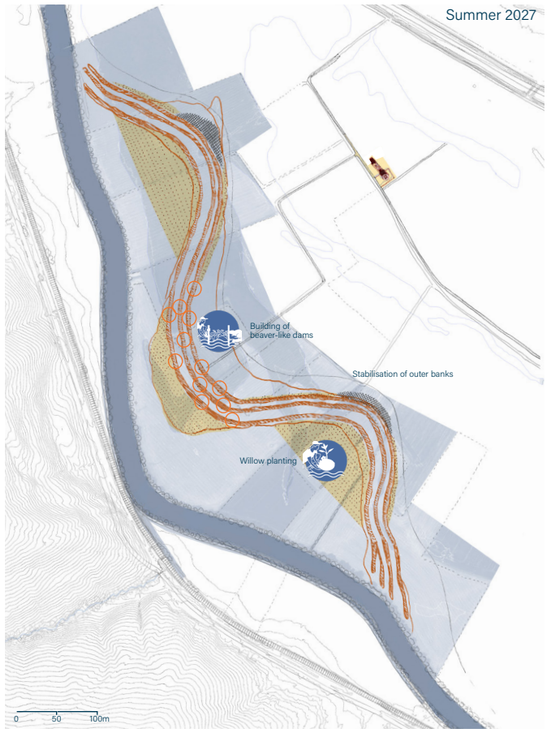
The modelmaking experiment was complemented by perspective sketches, used to compose the new views of the landscape that this impactful project creates. The experience of the users of the new system of paths was taken into account to come up with the composition. The succession of floods of the first winter after completion are expected to quickly create a varied river landscape, with small islands of sediments. This is an hypothesis that again requires a further testing of the meandering dynamics. Another round of testing and calculation would also provide for the lowering of river height in the center of the city in case of a 100 years flood, caused by this project of upstream river slowing.



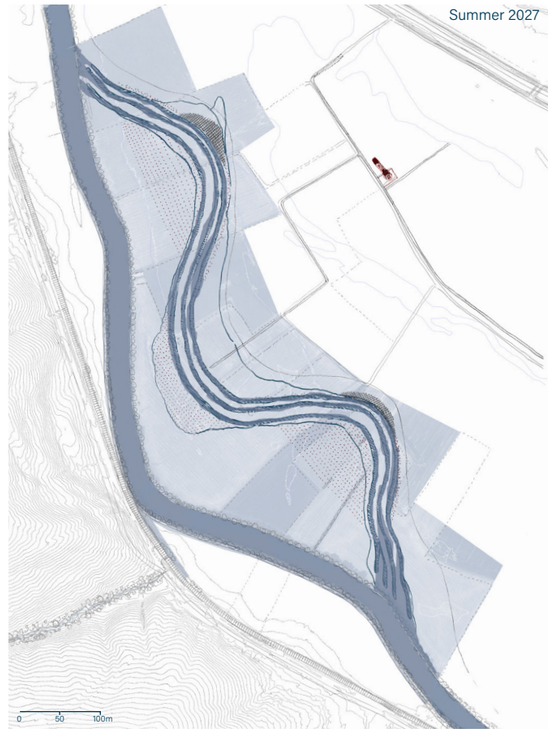
1. Current river channel, embanked and stabilised by alder rows.



2. Digging of three trenches. On the paleo-river bed.



3. Collective planting and building of beaver-like dams .

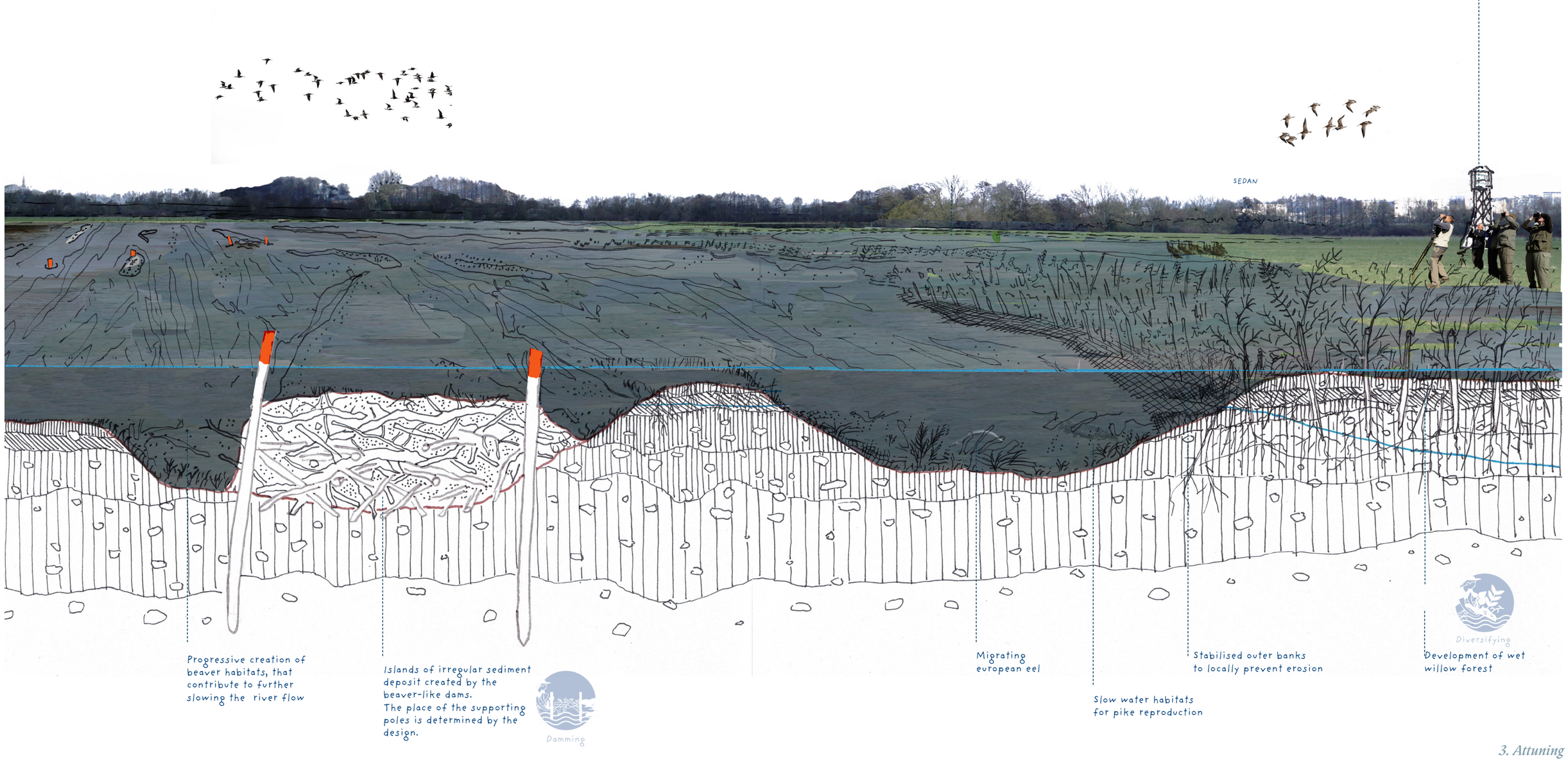


3. Branching of new channel, temporary situation with double river course.

The first meanders

February 2028

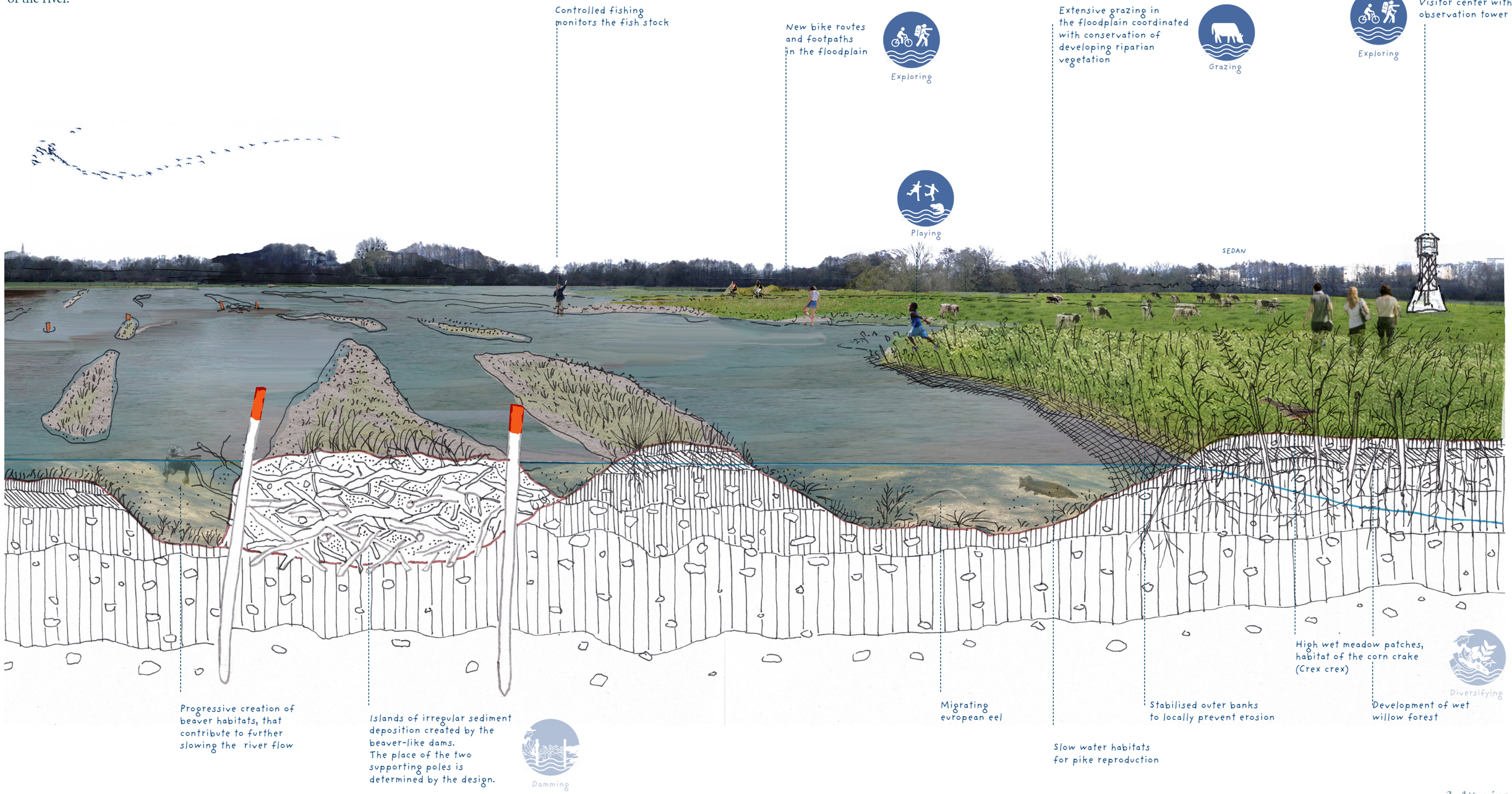
Situation at the end of a seasonal flood, during which the plain floods more easily because of the new profile of the meandering channel. The first migrating birds reach the meadows of the plain, greeted by the binoculars of birdwatchers.



The first meanders

April 2028

During spring, at the end of the first breeding season after the remeandering of the Meuse, recreational and productive human activities coexist along the new slow water habitats of the river.



3.6 Propagation of the pilot projects

MARCH, 2030



In the carpet factory, the Tapis Point de Sedan, various associations use the large spaces to organise events, such as a (swap)market of local seedling in the beginning of the gardening season.



Outside of the renovated factory, the “entrance” of Sedan is now a thriving public space.



The riverbanks are almost all connected by a path that allows the people of Sedan to benefit from the sights of the Meuse throughout the seasons.

The termination of the landscaper’s contract does not stop the evolution of the territory of the Atelier Meuse. Through the work of the Stewards the headquarter establishes itself as a key institution in the city of Sedan. Together with newly appointed landscapers, these can coordinate the realisation of other projets in the city.

The flexibility of the territorial framework, of which the realisation is enacted in the activation phase, is the heritage of the first years of the Atelier Meuse experience.

FEBRUARY, 2030



2035 At the place of the former weir in the city center of Sedan, a widening of the riverbed has finally been excavated after years of preparation. Colonies of beavers, that thrive in the plain just uptream of the urban area, swim towards other sections of the river to slow down.

6. Atelier Meuse - conclusion

- How can a *floodplain atelier* in Sedan, France, serve as a landscape laboratory for attuned riverine practices and relations with the time of the Meuse river?

Positioning, revealing, attuning

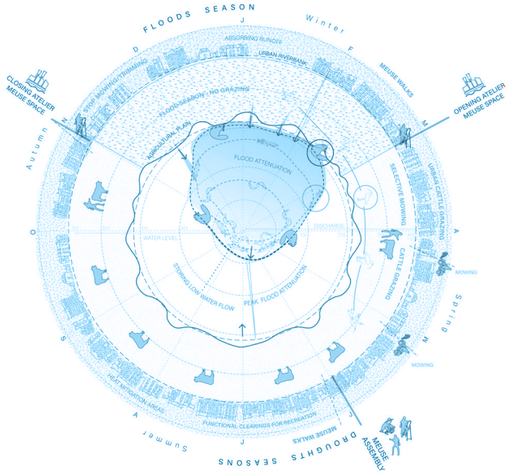
In this third chapter of the thesis, the process of a speculative *floodplain atelier* has been illustrated, focusing on the steps that define the role of the landscaper in its design process and successive realisation phase.
The three parts of the chapter reflect three key moments in this landscape design itinerary, in which a transformation of the river space, hence its course and adjacent floodplain, are enacted from the particular site of the Atelier Meuse headquarters.
From this positioning, simplified for the sake of this graduation thesis to a site visit of a few days, a territorial diagnosis including the climatic, social and ecological aspects of the landscape could be conducted.
Through different methods, of which the interviews with two key actors in the territory stand out, this diagnosis has shown the need for acting with imaginative force towards the creation of new territorial values. *Slowing* the river, *gardening* its edges and floodplain, and *belonging* to its territory have been motivated as values that together inform the spatial strategies of a flexible territorial framework. Within the latter new riverine practices are possible in thefloodplain space of Sedan.

Riverine practices

These practices mark a new period in the collective relation of the city and its upstream plain to the river, after the progressive decay of the industrial and shipping use of the Meuse left a blank spot.
All symbolically named with a verb, the practices allow for more or less direct relations to the Meuse.

Building a beaver- like dam, playing with the sediments, or gathering with the river during the yearly Meuse assemblies bring the public directly in contact with the river and its dynamics. Other practices also bring in contact the actors that perform them with the mutable floodplain landscape. Moreover, their seasonal character brings human inhabitants of this floodplain in contact with the life cycles of other beings, whether domesticated grazing cattle or breeding birds.

Alltogether these activities in the design calendar contribute to establish a direct timely relation with the rhythm of the Meuse, an attunement that ideally becomes embodied in the actors constructing, mantaining or simply experiencing the landscape.



The spatial river calendar of the design ideally becomes embodied in the actors of the territory throughout the collective realisation and maintenance of the territorial plan, in association with non-human species.

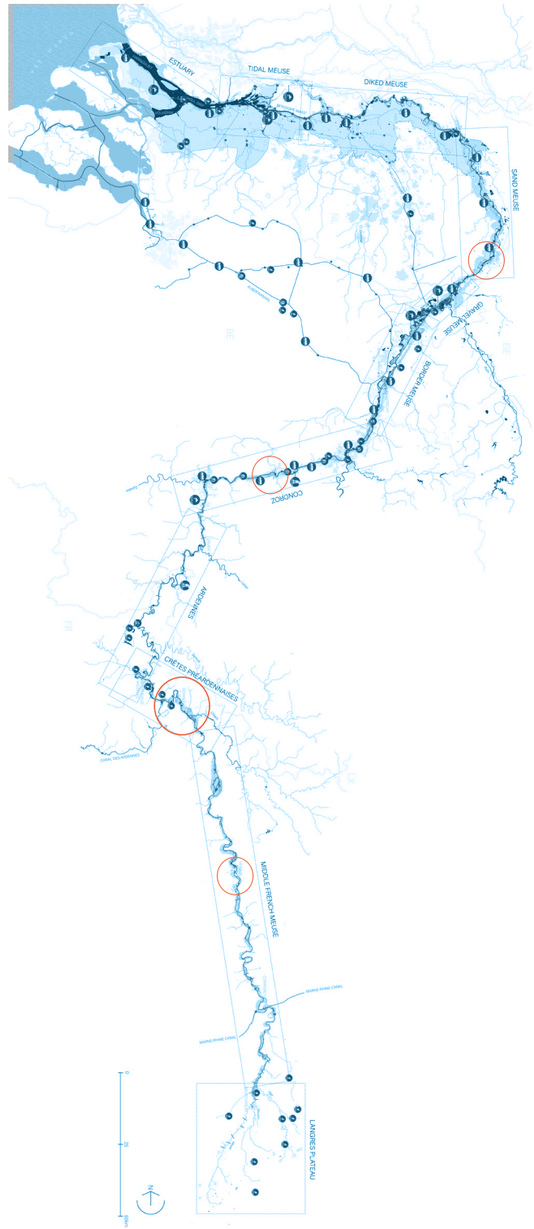


A transferable design process

The Atelier Meuse in Sedan can be seen as a laboratory, having determined through methodological experimentation the steps of a design process suitable to be replicated in other sections of the river.

In order to do so, further research on the scale of the international floodplain is needed to highlight parts that, like the area of Sedan, are characterised by a decaying social relation to the river and a vulnerability to flood and drought events (map right).

This is not the only possibility to transfer the design methodology elewhere: the *attuning* section provides an initial structure to weave relations between existing actors in territories with a similar size, to operate participative landscape transformation projects that react on different problematiques.



The possibility of applying the design methodology of the atelier, with the local variant of the Meuse calendar in other parts of the international floodplain. Similar urban-rural areas fragilised from deindustrialisation could potentially undergo similar territorial transformations to the floodplain of Sedan.

notes

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Conclusion and reflection

Conclusion

- How can the floodplain landscapes of the Meuse be revealed and transformed towards an attunement to the river's intrinsic rhythm?

A global disattunement

The revelatory aspect of this thesis emerged from the need of framing a landscape understanding of the Meuse river around its temporal aspect. This was done in order to respond to the need of understanding the time-related challenges posed on it by its human uses, while addressing the absence of *more-than-human* perspectives on the present and heritage aspects of this important european river.

The global inquiry in the first chapter exposed a disattunement of ten large scale uses of the river water to its intrinsic rhythm. The river, for long time seen by water managers as a commodity and infrastructure to be kept as stable as possible, has mostly suffered from a regulation of its water level through structures such as dikes and weirs, needed for shipping, flood safety and energy production. Further research is needed on this scale, where the limits of landscape-based knowledege stop at understanding nuances of different water quantity and quality requirements across the three countries of the international floodplain.

A local, fading attunement

With the methodological knowledge of the Circular Water Stories Lab, in which this research takes place, an ulterior step was made in the lacking documentation of the Meuse landscapes, on a smaller perceptive scale. A landscape transect was conducted through the section of the river with the least active anthropic pressures, according to the previous global inquiry. This allowed to document and redraw active- and traces of - practices that involve a relation between humans and the river, wether through non-humans or water works.

These traces are partly derived from uses of the Meuse water, like the human-steered maintenance of the needle dams for navigation, but their local specificity allows to see a closer timely relation to the river flow.

Through these practices, that have been classified as direct, mediated or indirect in respect to the river water, the intrinsic time of the river stayed central in the life of the local communities along the French Meuse.

Attuning to the time of the Meuse

The transformation of a threshold section of the French Meuse, between a rural and post-industrial urban area was enacted through a territorial design process named floodplain atelier.

This design process showed the steps that could facilitate both a spatial adaptation of the local landscape, and the cultural relation of its inhabitants to their territory. Reacting on the vulnerability to extreme climatic conditions, a social fragility, and the fragmentation of non-human habitats of the floodplain, the proposal is based on the implementation of three design values, that foster seasonal riverine practices in the space of the project.

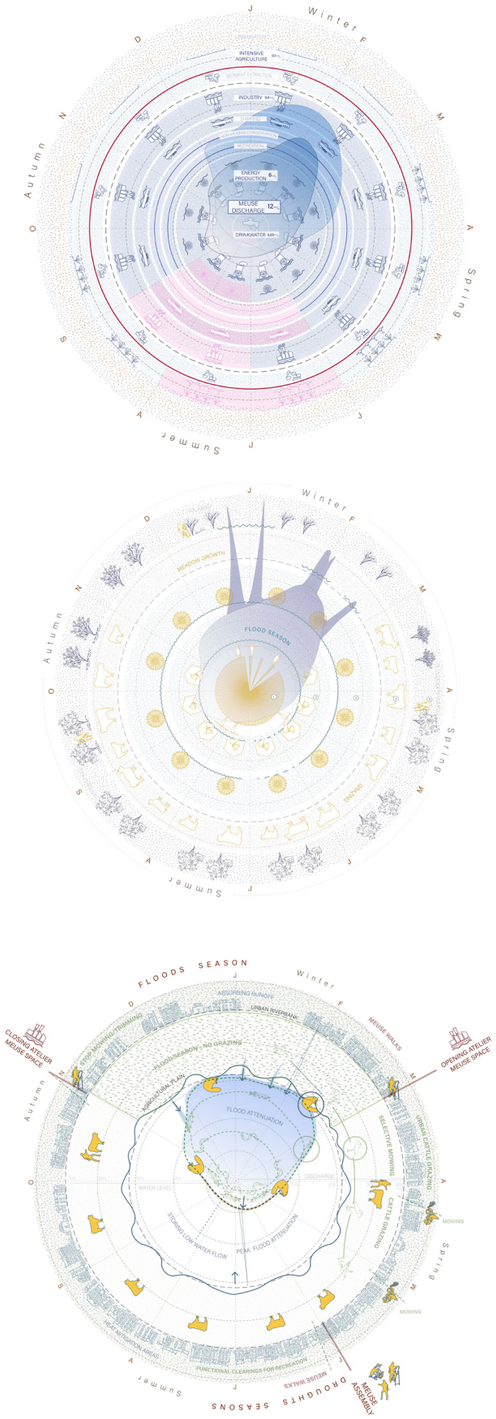
Within the flexible spatial framework of the design, these practices are not only an outcome of a spatial transformation, but the very agents in the latter. A multiplicity of actors in the territory, like cattle farmers, local associations and the proposed Atelier Meuse Stewards contribute to a social construction of the landscape. With direct engagement such as the planting of trees, the mantainance of a community garden, or the active contribution to the remeandering of a part of the Meuse, these practices allow for a process of attunement to the cycles of other non-human beings and the intrinsic rhythm of the river.

Similar design trajectories in other sections of this international river, where analog current relations to the river are at play, could together enact a larger transformation of the Meuse. Further research in this sense is needed to find a balance between local productive and recreational practices, with intensive uses of the river water.

A methodological response

Rather than proposing attunement as a measurable solution, the thesis advances it as an ongoing, situated process through a direct interaction with the river in the landscape. The representation of spatial calendars throughout the different parts of the report illustrate this conceptual shift, from detached uses to practices with the Meuse.

This methodology opens up future possibilites for research and practice in the international floodplain, where the complex interplay of cultural, ecological, and temporal dimensions demands renewed forms of representation and design action.



Three spatial river calendars corresponding to the findings of the three chapters.
The first calendar shows the continuity of all intensive uses of the river water throughout the year and moments of the Meuse rhythm. In contrast to that, the local calendars in the second and third chapter show an attunement of cultural practices to the seasonality of the river and the other species inhabiting it.

Reflection

The evolution of the problematique

This research has undergone a long, personal evolution of its scope and employed methodology to study different aspects of the Meuse landscape, before arriving to the final problematique that forms the premise of the thesis.

As introduced in the Fascination section, I initially approached this river as a site that could combine a personal knowledge of the Dutch and French landscape traditions.
In the start of the graduation year, the aim was in fact to understand on which right scale and what part of the upstream Meuse to position a landscape design that could contribute to quantitively "solving" the problematique of increasingly recurrent floods downstream in Netherlands.

While learning about the hydrological aspects of the river, the characteristics of its soils and local climatic conditions, I understood however that there was not a real possibility of designing a landscape intervention with such distant consequences. At the same time, I learned that another equally impacting climatic extreme is becoming a pressing issue for this river: the prolonged summer droughts making the discharge of the Meuse extremely low at times. To mitigate prolonged droughts, a limited amount of reservoirs exists in some parts of the watershed, but these can contribute to a very limited share in the absence of water quantity during these periods. These informations induced a realignment in my stance towards the river in the project: rather than looking for adaptive solutions to keep current river uses in place, the need emerged to find alternative ways of dwelling in and with the dynamicity of the Meuse.

Methodological relevance

Inspired by interdisciplinary approaches tested in other river territories, focusing on a critique of the ways of inhabiting the waterscape rather than the technical promise of adaptation of its flow, the research shifted in direction.
Using the gathered knowledge on the hydrological characteristics of the Meuse, the formulated problematique focuses on the cultural relation to both extreme conditions of the river discharge, stressing the need of representing this relation through progressively situated scales of the river (right), in order to come up with different ways of inhabiting the landscape.
In this sense, the first chapter acts in reality as a further introduction of the initial research statement. The documentation of the overall uses of the Meuse and their spatial implications was informed by the majority of existing research and data about this river, focusing on the river as a whole. The limits of this scale of inquiry also lie in my representation of the implication of the ten river uses. A drawn catalog of the infrastructures the uses need in the different river landscapes would be for example useful in complement to the proposed thematic cartographies This would better show the impact on the space of the river to affirm their negative pressures.

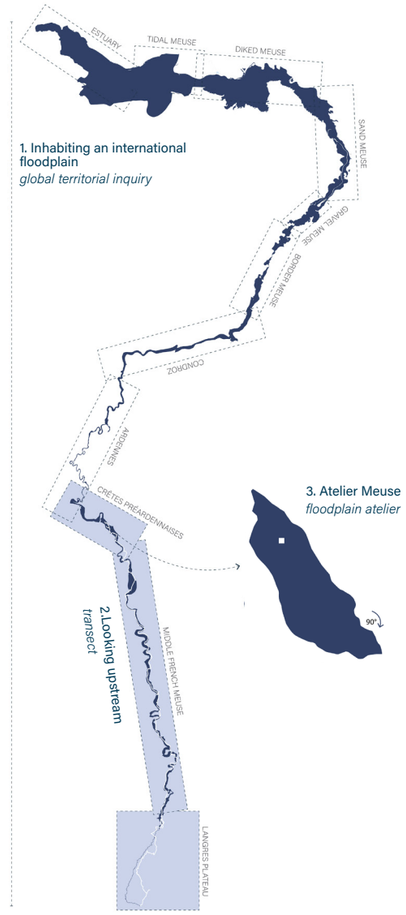
Especially for what concerns (cultural) landscape descriptions, the existing literature on the global scale of the Meuse tends to overlook specific sections (except for the Dutch part, which has been more thoroughly studied).
This has been the reason to plan a cycling transect along the French section of the river. Mobilised as one of the two main methods of the second chapter, it was conducted early in the graduation year. Reflecting back on the organisation of this part of my research journey, I am now aware that a better preparation is needed for such fieldwork method to maintain a closed scope. The outcomes would become clearer by setting up a protocol beforehand, for instance preparing standard questions for interviews along the way, or noting with the same style the observations and encounters in the landscape.

The design process took shape as a progressive refinement of the scope of the research. Central in its evolution was the moment of the site visit, which played a fundamental role in formulating a local design assignment. Although undertaken later than what is common sense in the graduation process, this experience clarified the importance of a direct spatial engagement with the landscape: not merely informative, but foundational to the development of a situated project.

In these important days on the field, the method of the interview has been mobilised as a valuable tool to grasp the local ongoing social dynamics of this Meuse landscape. Being new to this approach, I noticed however a tension that emerged between treating these interviews as direct design prompts, or seeing them like other data as part of my territorial diagnosis. More experience in this method would allow for a more explicit applicability of the interview outcomes in the design process, also considering the different type of knowledges gathered by the actors. The farmer I interviewed, for instance, bases his account of the seasonal floods and droughts on memory, therefore his understaning of them has a different meaning than raw hydrological data.

In the design experimentation phase, a significant advancement in the structuring of the territorial strategy came through the experimentation with the spatial river calendar. Initially conceived as a descriptive representational device, it was employed here as flexible and intuitive design tool.

Finally, the research into the relationship between design representation and its on-site realisation, particularly at the small scale of the construction of pilots in the activation phase of the plan, opened up a broader reflection on the life of a project beyond its conceptual phase. Observing this tension first-hand reinforced my intuition that landscape design must be embedded in the temporal unfolding of practices in that landscape, and the collaborations of actors involved in them. This attention to the continuity between design and construction suggested me potential further explorations after this graduation project, situating in the current debate about the landscape discipline as a choreographing activity.
The system of the "territorial markers" for instance, is a topic to further explore in other designs.



The methodology of the thesis across scales.

Reflection on my role as *landscaper*

Action-Research

I introduced this thesis project with a short writing about the position and role of landscapers, before and during the act of designing.
Their first quality, as action-researchers, motivated my two trips to the French Meuse, the second one focused on the floodplain of Sedan.
These explorations, in which I tested the methods of the annotated, photographic journal, are the very hearth of all the reflections the come afterwards. When sitting far away from the rich, almost overwhelming complexity of the on-site perception of a place, a lot gets lost (and rightfully so) in its transposition. In my future projects, I intend to experiment more with methods like the transect I employed in chapter 2, and formalise better the interviews that happen at many stages of a long research like this one.

Representation

As stated in the same introducting essay, the challenge of representing the complexity of landscapes is at the core of the discipline. During this year of working on my thesis project, I tried to make a step towards integrating conventional methods, like projective, GIS informed cartography, with other tools. In this sense I believe that my proposed version of the spatial water calendar, a method that is not entirely new in similar landscape research, became a rich terrain of personal experimentation. Although I acknowledge the problem that it might not be readable at first sight by an outsider from the discipline, it can certainly inspire colleagues in the field of landscape to embrace time as a central aspect of analysis and design in dynamic contexts like the riverine one.

Choreography

Although touched upon in the last section of the design chapter, relative to the Atelier Meuse, this stance in landscape design requires further research to be fully integrated into a complex territorial transformation like the one I propose in the present thesis. As introduced in the theoretical framework part of the Introduction, this topic is relatively new in the debate, and might profit the most from concrete explorations (unlike the fictional aspect of my graduation project) to be operationalised. Nevertheless, the most important learning I drew from this approach was indicating in the beginning of the design exploration who are the actors that "shape" the landscape, whom with to collaborate for a fruitful and bottom-up design transformation. The sequence of actions they perform in the construction and maintenance of the project is a further step in the planning of similar participatory design trajectories.

Passionate and daring choices

Measuring and assessing courage in the design is something I leave to more experienced professionals and educators in this discipline to judge the outcomes of my project.
However, since I stated it being one of the most important abilities of a landscaper in my introduction, I want to reflect back on my position in relation to the transformative changes of the Meuse landscape I have drawn in this graduation work.

When looking back at the overall outcome of my design, I believe in the strength of a measured yet feasible spatial transformation, anchored in the existing qualities of the landscape and its potential. The ambition of drawing a project situation in which actors from the same territory ally to enact change might be questioned by the lack of a strong conceptual "figure" that arrives in the studied landscape as a promise of change. I stand however by the conviction that a vulnerable, fragile and fragmented landscape like the one I immerged in, can benefit the most from architecting a cooperative shift in communal values rather than importing a design ideal from outside. In the case of the project, I make explicit in this "ordinary landscape" the figure of the floodplain, as the mutable materialisation of the river.

In the strategies of the territorial plan, I aknowledge having imported in the reality of this territory values that don't belong to the current local collective relation to the place. This is most explicitely the case for the remeandering of the current river channel, an undertaking that would be at place in the dutch planning culture, rather than in the plain of Sedan. This brings a moral dilemma to the very conceptual phase of the project, that in reality could be solved by a participation trajectory with inhabitants of the territory, local representatives, and experts of the basin authority during the territorial diagnosis.



Speculating about the Meuse river territory, with its temporality as a central theme, could inspire similar researches on other (european) rivers.

Societal and professional value of the research

This work represents a pivotal moment in my development as landscaper, learning how to conduct a one-year project between experimentation and discipline, needed for the planning of its articulated phases.

The freedom to define both the project theme and approach has provided me a valuable platform for integrating diverse design perspectives, making me evolve as a student and future professional. Moreover, the extensive research period has allows me to deeply engage with current discussions within the scientific field of landscape architecture (representation of time, landscape heritage) and other disciplines, like environmental humanities, hydrology, and anthropology. Ultimately, this work serves not only as the culmination of my education but also as a first step toward my future career, where I aim to contribute to the evolving conversations surrounding landscape architecture in riverine landscapes, and to the role of choreography in this discipline.

I have introduced and reflected on this project from my positioning as a landscape architecture student, and human, towards some of the challenges that this time poses to our society: the fragilisation of collective identities, care for non-human life, adaptation to the consequences of global climate change.

The design process has shown that responses to these issues are possible. Representing possible near futures through creative, collaborative solutions is the key to "reinvent" ways of relating in our environment. This possibility also importantly lies in the acceptation that landscapes are cultural constructs, that many processes that operate within them are humanly induced, as consequences of political (thus societal) decisions. This will hopefully inspire the people next to me, that will read this work, to look more carefully at landscapes, and at river landscapes in particular, beyond a romanticised or disempowered gaze that devalues our impact as humans.

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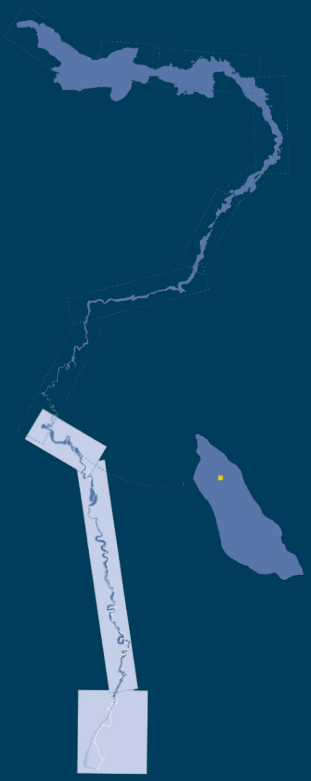
Dedicated to those who nourish my passion for this discipline, that is in the midst of exciting evolutions to its methods, engagements, and outcomes.
Filip, Elias, Louis and my closest *camarades* in Versailles.

To the supervisors who accompanied this journey,
Inge, Elena

And to those who always stand alongside me in my adventures
S.



SEDAN, ARDENNES, FRANCE

28.02 - 02.03 2025

tobias macchione

INTRODUCTION

This logbook has its place in my design process as a record of my fieldwork journey. Its purpose is to document the main outlines of my analysis of the city of Sedan and the surrounding plain through encounters, impressions, and sensory experiences.

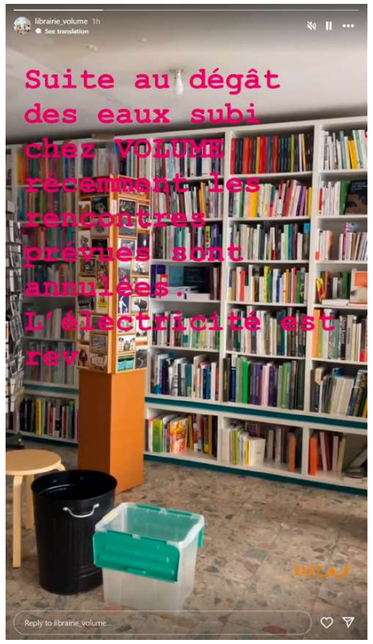
It is not intended to be exhaustive or thematically structured, but rather to capture some of the words I exchanged with the residents of Sedan at the end of winter 2025, as well as internal thoughts prompted by my exploration of this landscape.

The approach of the Atelier Meuse, which constitutes the third chapter of my final thesis, is partly informed by the reflections I introduce in this journal.

JOUR 1. 28 FEVRIER 2025

9 : 35

The Champagne Crayeuse region rushes past me at high speed toward the destination: the Ardennes of Mézières, Charleville, and Sedan. On the train, I leaf through one of the latest (2023) human geography accounts of the Ardennes that paints a portrait of the department and its employment hub. The owner of Volume, in Paris, recommended it to me just yesterday; I had gone there to buy, once again, books about water, about rivers, about 'ubiquitous wetness.' The dampness, less philosophical than in my recent readings, had taken over the shop the day before I arrived, seeping through the fragile plaster ceiling. My book, however, is dry, full of anecdotes, and paints a portrait of a territory in partial decline. I promise myself not to draw conclusions before even arriving in town. What kind of landscape project, by a Dutchman, in a region





even the French struggle to picture?

"Your arrival is imminent - please make sure you leave nothing behind."

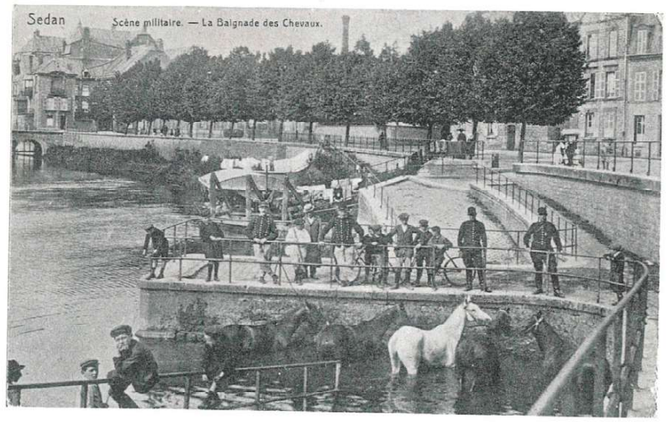


10 : 40

I reunite with the Meuse, gleaming through the faults of the same sky I had left behind here last November. Memories restore my confidence in this process, now more focused on an smaller landscape, walked rather than cycled. One that will reveal, more closely, a collective relationship with water. On the replacement bus from Mézières to Sedan, factories pass by one after another in a gradient of greys and browns. Just downstream of the last bend in the river before Sedan, the coal power plant at Glaire comes into view, at least what remains of it. From the station square, I head toward the town center, cutting beneath the long, parallel horizontals of the old towpaths, now cycle routes, grey and solitary, which no one seems inclined to use to reach the heart of the city. I turn the corner, opening onto the coal habour, with its minimal levees.

By pure chance, I come across local officials visiting the freshly planted row of trees along the new bike path. Efficient, Colas did the job well I guess. It's a stretch with the feel of a neo-suburban road, difficult to reconcile with the older, lower paths that run low next to the water and coat my shoes in grey.



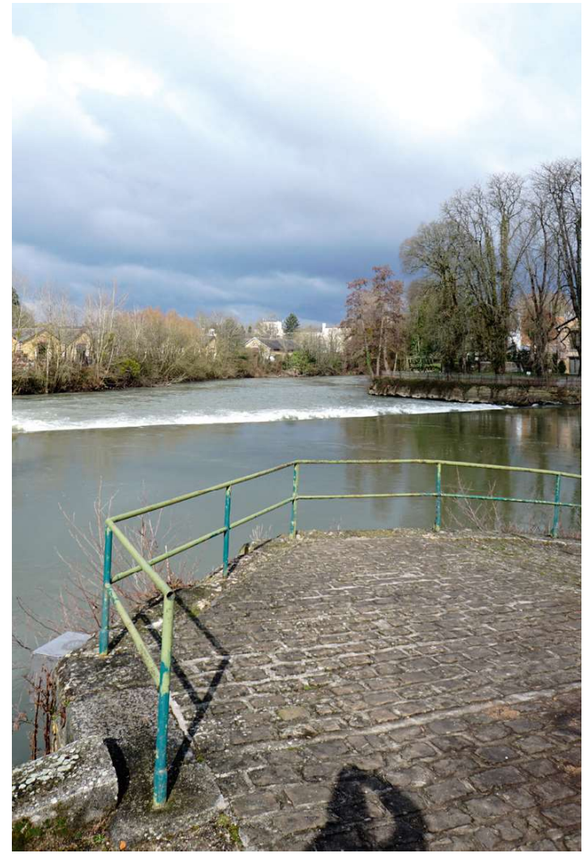


11 : 05

Once again I feel the river's threatening lightness, its riverbed almost visible beneath the transparent green. 'Quai de la Régente' what does that even mean, I wonder, as I hear the sharp sound of the weir just opposite the ramps that descend into the water, staging it superbly. It's the setting for an imaginary gathering, where sediments cover the cobblestones, waiting for feet or paws to come feel their softness.

Here, a hundred years ago, I read that soldiers would come down with their horses. I continue on, curious, toward the Ru du Moulin. I should have guessed earlier the significance of the immense glass facade still concealing the molds and machines. Beneath the feet of the Moulins de Sedan, the Meuse flows slow, threading its way between trunks stuk into the pylons of the bridge.










MOULINS DE SEINE








A LOUER
06 11 08 90 96
A VENDRE MOULIN
06 11 08 90 96
06 95 62 96 94

11 : 30

The Place d'Alsace-Lorraine opens up before a true Louvre like high school building, with a view cutting through to the quiet quay. On the south side, the Botanical Garden is the only real public park in the city. Far from the noise of the students, an annex of the municipal technical center is the setting for my first interview of the day. Sullivan Mabillon, director of landscape maintenance for the entire municipality, welcomes me into the shed. He introduces me to the world of pruning on the Sedan scale; we talk about tree species, both future and existing, and he shares his vision for a differentiated management strategy he launched in 2021. Acacia and sweetgum, the new arrivals in recent landscaping projects, are gradually replacing plane trees, maples, and ash trees afflicted by ash dieback. He favors slow-growing trees -maintenance is a concern- and new plantings adapted to rising temperatures.

He has a particular interest in education and the vulgarisation of his work: at the Castle (the true center of the city), bat stories, biodiversity, and beehives engage the few schoolchildren still living in Sedan. Enthusiastic about my interest in the riverfront space, he accompanies me to see if the (to me) mysterious photographer who bought the house on the small islands to turn it into his studio, is home. No luck, numbers exchanged, a smile, see you sometime.











16 : 30

By now, it's a personal established tactic -browsing through the 'local geography and history' or 'regionalism' sections of the local town library. Often, I pull books off the shelves that I would struggle to find at Beaubourg, or even at the BNF. I flip through the annals and almanacs of local historical societies, or through landscape-format books with 'aerial views.' I stay for more than an hour, scanning everything I can find on Sedan and the Meuse. That's where I discover Roger Vincent, a leading Sedan-born photographer from the postwar reconstruction era, a joy for my eyes and for all lovers of black-and-white street photography.

Constance welcomes me at the threshold of the 'Bains-Douches', the city's Heritage Museum. A very young team here studies and shares the major threads of Sedan's history, war and industry. The fortifications, 16th-century ramparts, and the 'Dames de Meuse' are still visible. The city's manufacturing boom after 1642, with the legendary Dijonval and other central usines, tied to fulling mills and dying facilities. The more ordinary aspects of water, for her, include the wash-boat, bridges, the navigation system, and water sports like rowing. They've dedicated part of the permanent exhibition on the city's heritage, on the ground floor, to these themes. We talk about upcoming projects to rehabilitate abandoned factories, such as the Tapis Point site, which is set to become a community place. Vacant buildings until the not-so-distant future, far removed from the city's textile boom that belongs to the past.

It's good to meet specialists on the first day of the survey, before documenting the city beneath my feet.



19 mars 1959. l'intérieur de la poste de Torcy. Elle est équipée de tout le confort moderne : pèse-lettre de précision, balance, bureaux et sièges en bois.
FV N1136



Inauguration du nouveau standard téléphonique de la poste, place Turenne. C'est encore l'époque du *22 à Asnières*, immortalisé par Fernand Raynaud.
FV N3303

Page de droite :
23 septembre 1951. *Prends-en de la graine* semble dire cet horticulteur à son jeune interlocuteur.
FV T13 P1364



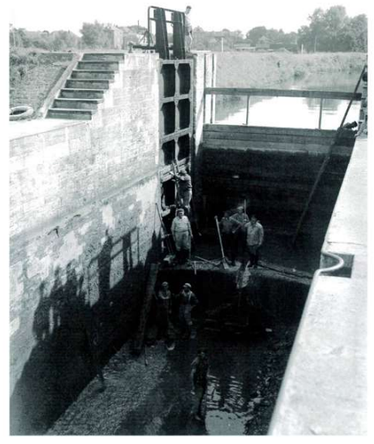


Déchargement d'une péniche pétrolière au dépôt Esso de Remilly-Aillicourt.
FV T24 P1417A002

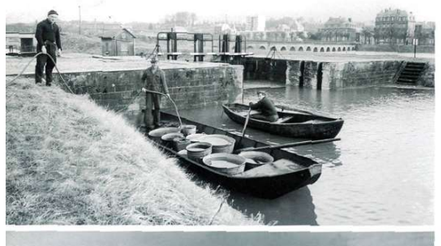


fluviale. Une drague en action
lit de la Meuse. Le gravier
é est déversé dans une péniche
qui va le transporter vers un
un grossiste ou un chantier. À
de la photo, un groupe de
rs traverse le fleuve sur un
mû à la godille, une technique

FV N3054



Remettre la navigation en activité nécessitait également de réparer les ouvrages d'art, les barrages, les écluses. Des ouvriers du Service de navigation des Ponts et Chaussées réparent les portes et les bajoyers de l'écluse de Sedan. Leur taille donne la proportion de l'ensemble. On peut aussi s'étonner de leur nombre à l'heure où la machine tend à remplacer l'homme…
FV T24 P1431A001



Février 1961, remplissonnement à proximité de l'écluse du canal de Torcy.
FV N3938



Août 1956, concours de pêche sur le canal des Ardennes à côté de l'écluse de Malmy. On est venu *en famille pour* surveiller le bouchon… avec plus ou moins de conviction.
FV T31 P1947A004



Ces yoles agglutinées près des péniches appartiennent à un groupe de sportifs hollandais, descendant la Meuse à la force des poignets, trouvant gîte et couvert, le soir venu, dans les deux bateaux portant le pavillon batave. Ces deux péniches à la forme fuselée croisaient en estuaire ou sur le Zuiderzee en navigation mixte, voile/moteur. Leurs capacités de chargement sont nettement moindres que nos *38 mètres* type Freycinet.
FV N3064

20 : 28

Are there any tickets left? The foyer/hallway is filled with the generation that is about to get personal with the story. By pure hasard I attend a theatrical performance about the silent tragedy of the textile working class, between the north of France, post-war Japan and today's Chinese relocation. Disparities, struggles, deaths, silicosis in the lungs and a capitalist drama that has a special place in the social space of the theatre where I am a guest. What is the genealogy of a complex heritage of proto-capitalist industry, broken hands and textiles in the landscape of tomorrow, here?

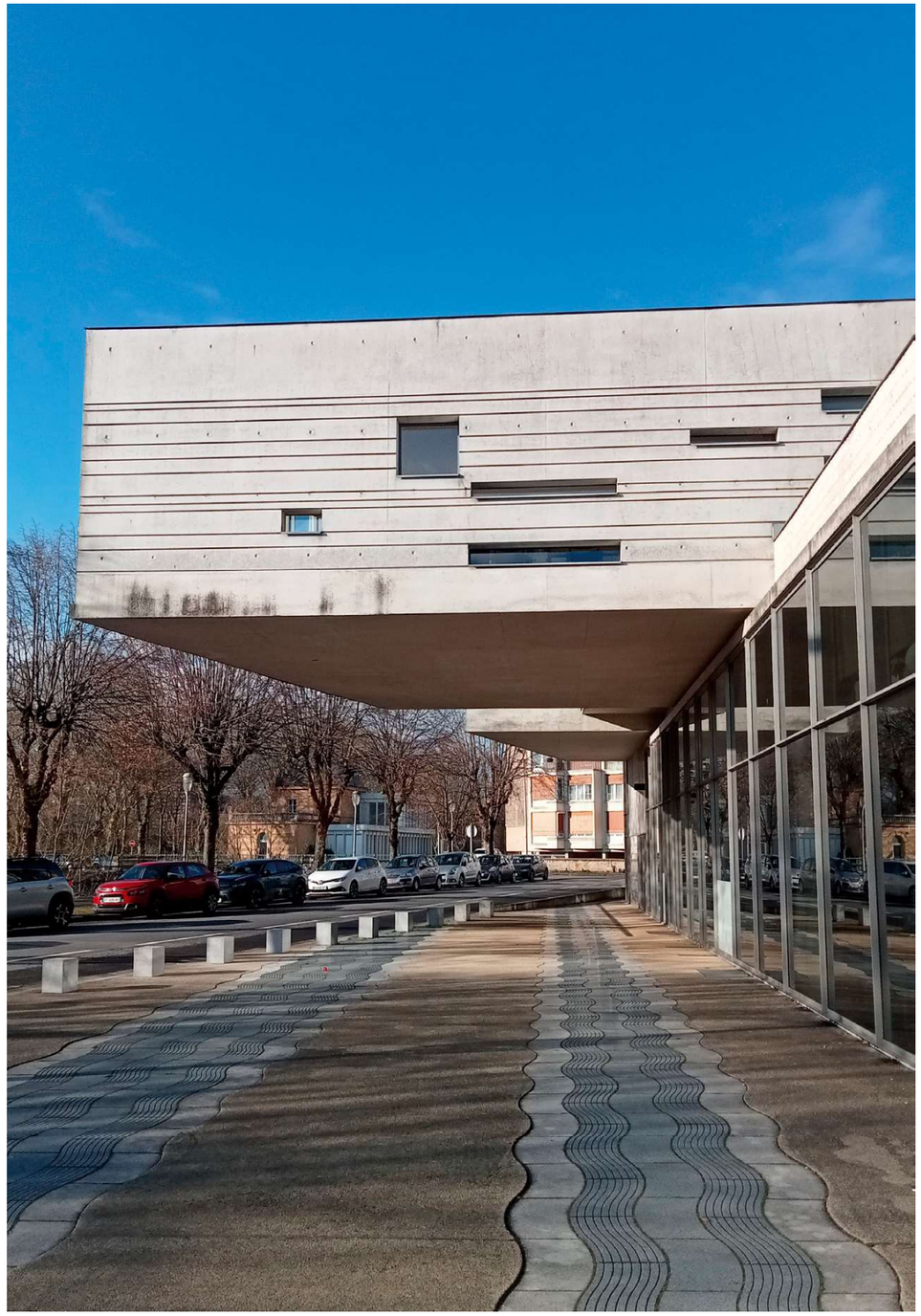












JOUR 2. 01 MARS 2025

9 : 04

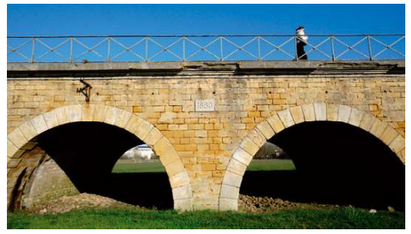
As I head towards to what was a coal harbout to take some new photos, I feel a bit like those cameras on Google cars driving around cities. It'll come in handy, just in case, I repeat to myself, thinking of the times when I would have paid to know how a point on the map consulted in Delft would open up in perspective view. A view from a human being by the way, not from giraffe height like the ones you find online.

I cross the bridge opposite the small levees, towards the island dominated by the Torcy meadow. There should be lawns like this in every city, I think to myself, thinking of the Malieveld in The Hague.

Even under the viaduct, the sun is warm, casting my shadow in front of my sure steps, heading towards the northern end of the island and its edge. This morning, I want to walk everywhere; my shoes find the crust-carpet formed by the frozen brambles that hold fast and cannot sting me. Not bad at all as a Saturday morning in the fresh air. I continue along the Meuse and come across the sub-prefecture building, which looks as if it has never been restored after the bombings.

Before taking the bus southbound to Bazeilles, I stop by the market like everyone else. It's one of the first sunny Saturdays of the year, and the whole of Sedan is there chatting, even talking about the Meuse and the end of the fishing season.

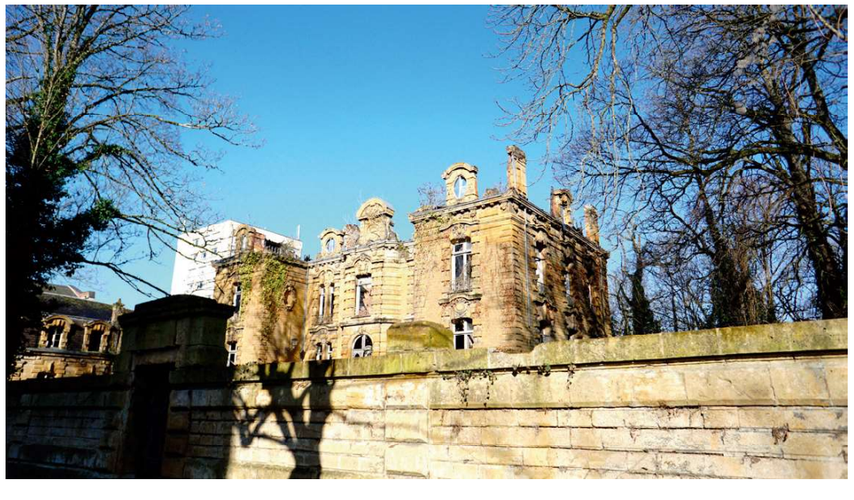
















10 : 40

Bus B is running perfectly on time and takes me to the town hall square in Bazeilles, a town just south of Sedan, where I'm meeting Mr. Lepage. I saw on the land registry that his farming activity owns a number of plots in the Meuse floodplain.

Everything happens very quickly: I see his son and teenage daughter, both wearing New Holland overalls, and we enter the main barn passing next to the milk tanks. To the sound of a robot refilling the cows' feeders and of the cables removing the cattle's excrement, he tells me about his farm, which he took over from his father after two generations.

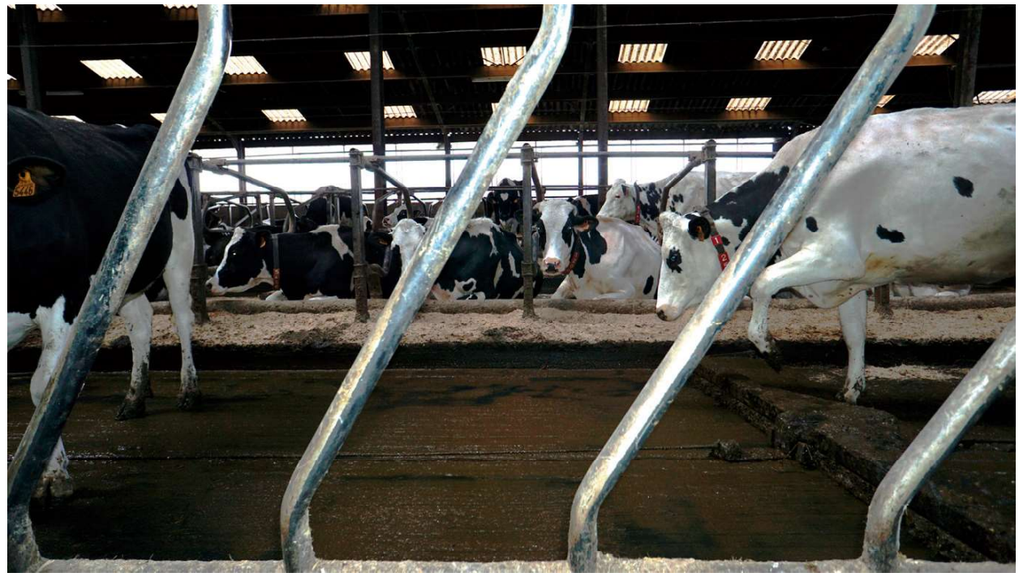
Since 2018, it has been a dairy farming operation based on 400 hectares of forage plots. We talk about mowing frequency and climate challenges, the other cattle farming



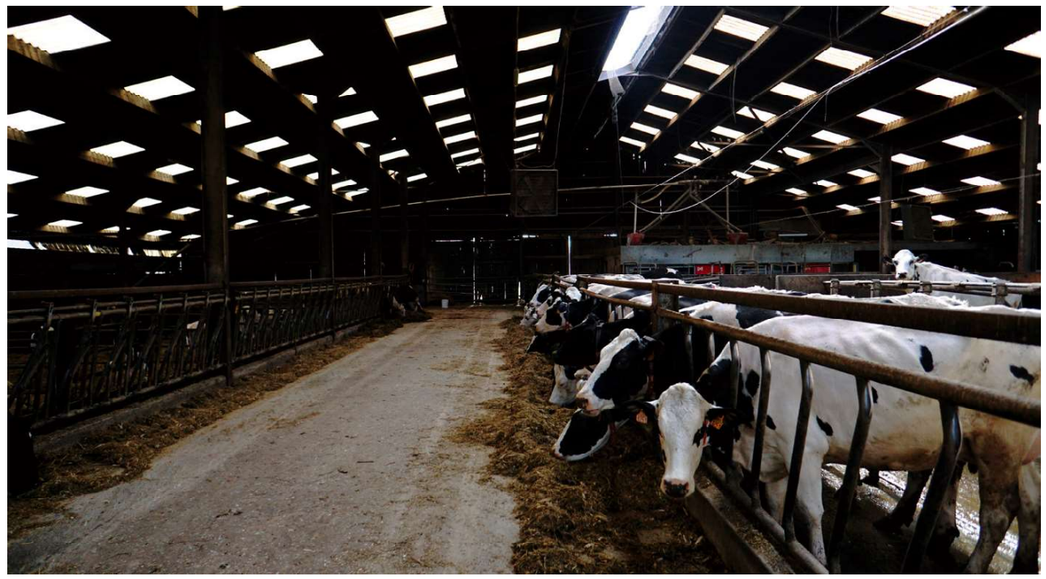
practices I had seen in November, but also the relationship between agriculture and urban areas. Jean-Christophe shows a particular commitment to the de-impermeabilization of cities and its consequences on water level in drought periods. Like many farmers, he is frustrated by being held responsible for all environmental pressures. The EPAMA (water authority) and compensation projects in flood expansion zones are a distant event in the future. At the Ferme de Turenne, the horizon is rather close: finding employees to continue the work. Leaving the farm and its methane digester, I wonder what grazing along the Meuse would look like without all these challenges, with cows quietly grazing in the fescue, perhaps even in the Torcy meadow.











11 : 30

I walk back up the meadows towards Sedan; my eyes focus more closely on the species that make up the pastures and their hedges, or what remains of them. Roses, hawthorns, prunus, among others. A runner passes me, and I imagine how much a proper GR trail here would benefit the inhabitants of the surrounding communities. Below the barbed wire, I make my way towards the riverbanks. After the national road, I see the blue lake, just below the level of the Meuse.

Here I encounter Lyes, originary from Russia. He and his friend have built a hut out of alder and ash branches to spend the night in. It reminds me of the figure of the Beaver in Morizot's latest book, and the reappropriation of the river's (vegetative) dynamics. The two teenagers' plan is to travel across Europe by foot, as their parents did for fun when they were their age, he tells me. Living off hunting and fishing, and creating memories to share with friends. I shake his hand as I tell him about my plan, which is much more vague than his, and wish him good luck. We'll stay in touch on social media.





















11 : 30

After my lunch break, it's gray outside, and I lazily head out to the industrial friches I want to photograph. When I arrive at the Quai de la Regente, the central riverside of Sedan, I see a scene that looks like the invention of a landscape student who wants to bring people closer to the Meuse.
The whole city is on the quay, phones in hand, noses turned toward the water and the ramp that I now know very well. The red of the fire trucks announces a tragic event: a Renault, which fell into the water near the train station bridge, they tell me, is stuck on the concrete weir in front of the old barracks.

The evacuation operations last a good hour: as I would have only drawn, a collective portrait of the people of Sedan on the riverbank, listening to its - disasters. I also hope they are sensible for its gifts, I think, as I walk away towards the city center. The friches will wait for me tomorrow.





18 : 00

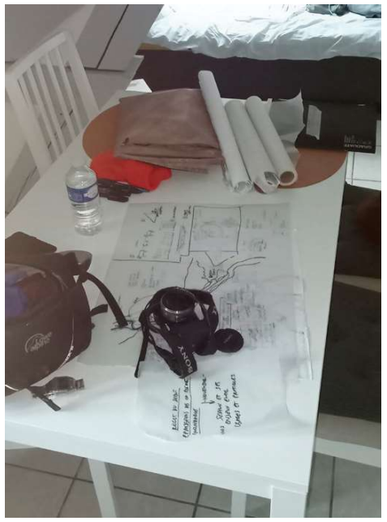
I repeat the exercise of local books research in the municipal library, this time in an antique bookstore. On three floors of a house in the city center, a true librarian classifies books, records, and magazines using an endless 6-digit classification system, accumulating them up to his own office where I am invited to browse through local history and geography piles. Everything is interesting but far too detailed, and fatigue leads me to fall back on Yves Kretzmeyer's Ardennes comic books.

Before closing time, I go in search of pieces of fabric at the last specialized store in town. They don't have any French ones, let alone any from Sedan. The owner, skeptical of my intentions to experiment with graphic designs on wool, explains that all local production stopped in the 1990s.



On my way back to the hostel, the cars block my view, so I turn toward the big stadium along the Meuse River, and the music starts as the whistle blows to signal the start of the match. Everything falls into place perfectly. I go inside to watch the legendary Sedan football club, part of the city's working-class legend: this is where it all happens on Saturday nights.

One half of the game is enough for me before I go back to draw on my tracing paper.







JOUR 3. 02 MARS 2025

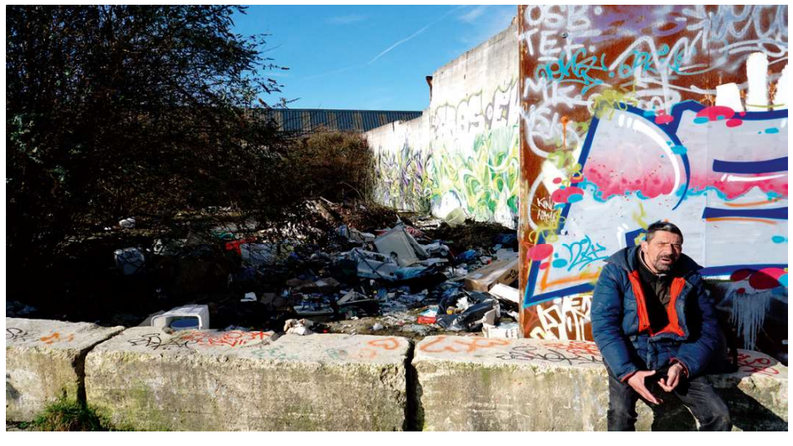
8 : 20

Sundays are particularly quiet in Sedan, especially along the Meuse canal, where the first early morning joggers greet each other on the cyclepath that runs along the banks. Today's first mission is to take my eyes, and a camera, to the friches, the industrial wastelands along the river. One of the vacant lots is an illegal dumping ground for local residents: between buddleia and willow trees, metal from household appliances finds a permanent home, an horizontal backdrop under the fragmented shade of dilapidated shed roofs.













I continue along the canal, the still line that doesn't seem to have been crossed since last summer at least, until I reach the next friche. It is guarded by a man who lost his job in February and who lets the chaos of rubbish embody his troubles. *If only people didn't mess around with my city.* Behind Torcy, at the confluence of the canal and the Meuse , I look for the old Tapis Point de Sedan, which Constance told me about yesterday. The old post-war factory stands at an angle at the entrance to the city, its dark bricks concealing a world still alive with cast iron machinery, cables, and rails hanging from the ceiling. A photography biennial apparently occupies the premises on a very occasional basis. In the shadow of the building, towards the Meuse, a curious confluence of Sedan history frames unfolds around a partly mowed lawn.

On the lower bank, the gray annuals of a past summer are content with the flow of the water. Further away, the last remnants of the city's war bastions protect the lawn and a plastic platform for summer sports. It's already perfect as it is, if only we could swim in the river. With strategic improvements and a mowing plan, this place could become a favorite of the people of Sedan.















10 : 35

I continue along the northern bank of the Meuse toward the Dijonval, once a royal manufactory of fine fabrics, and the site of its former gardens and orchards, now semi-deserted parking lots for the Intermarché supermarket and the hospital complex. This is where access to running water is most lacking; we are facing south here in the hot, endless days of July.

On my way back to check out of the AirBnb, I pass through the MacDonald neighborhood, home of barracks and infantry maneuvers till the 60's, that are still in the air. Sometimes you have to look for trees among the concrete slabs of the ground, pockmarked with sedges, and the macadam (that's what they call it in Sedan), still soft from a new pour next to the Torcy meadow. This paving must have been requested by the few residents who remain here, in the long plots of mansions next to a large construction company. The infantry horses would have very little to eat here today.









13 : 05

The people of Sedan are having their lunch as I leave the AirBnb, this time towards the south side: the Lac district, built in the 1960s, is still unknown to me. On Google Maps, it is a contemporary geometry of triangles, green and white squares of public housing. The wide avenues begin behind the football stadium: it is a large housing estate mixed with a contemporary *eco-quartier.*

The public spaces are immense, dotted with Aleppo pines that thrive on the sand imported here at the same time when the artificial lake was excavated. How to get from here to the center, to the services and the river, is a personal question that fades away in the noise of the first cars heading for coffee and a stroll along the Meuse.

From the huge parking lots here to the huge parking lots on the monumental squares of the old town, barely 1 km away. This time, there is hardly anyone on the quay. No tourists or villagers on Sunday on the Quai de la Regente, which basks in a light that makes you dream of summer.



















14 : 00

As I sketch the garage for sale opposite the turbulent weir of the Meuse, the true center of the city's aquatic charm, some young people from Sedan approach me.

John, in his early thirties, bought the entire building some months ago to convert it into student apartments. Drawing on his practical experience in the moving business and numerous YouTube videos, he began this journey, discovering one layer after another of this factory building, a former dying and spinning facility dating from 1876.

Underneath the trapdoors, he shows me the underground channels through which the establishment pumped and discharged its waste into the river. He shows me the access to the chimney, all the floors, and what remains of the annex next to the standing factory. From a violent fire ten years ago, one of the most beautiful wastelands I have ever seen emerged here within the limestone walls.

We exchange contact details, I dream of setting up a temporary workshop here to take these chance encounters further, meet the people of Sedan, and develop a concrete project.





18 : 05

After visiting the exhibition at the Maison du Patrimoine, which complements my discoveries about the river in the city and its urban planning at this stage of the research, I sit down for a few last moments facing the river, taking my time before leaving.

At sunset, the windows of a concert hall on the old coal harbour are lit with purple light and jazz-rock music.

For now, I say goodbye to Sedan.

