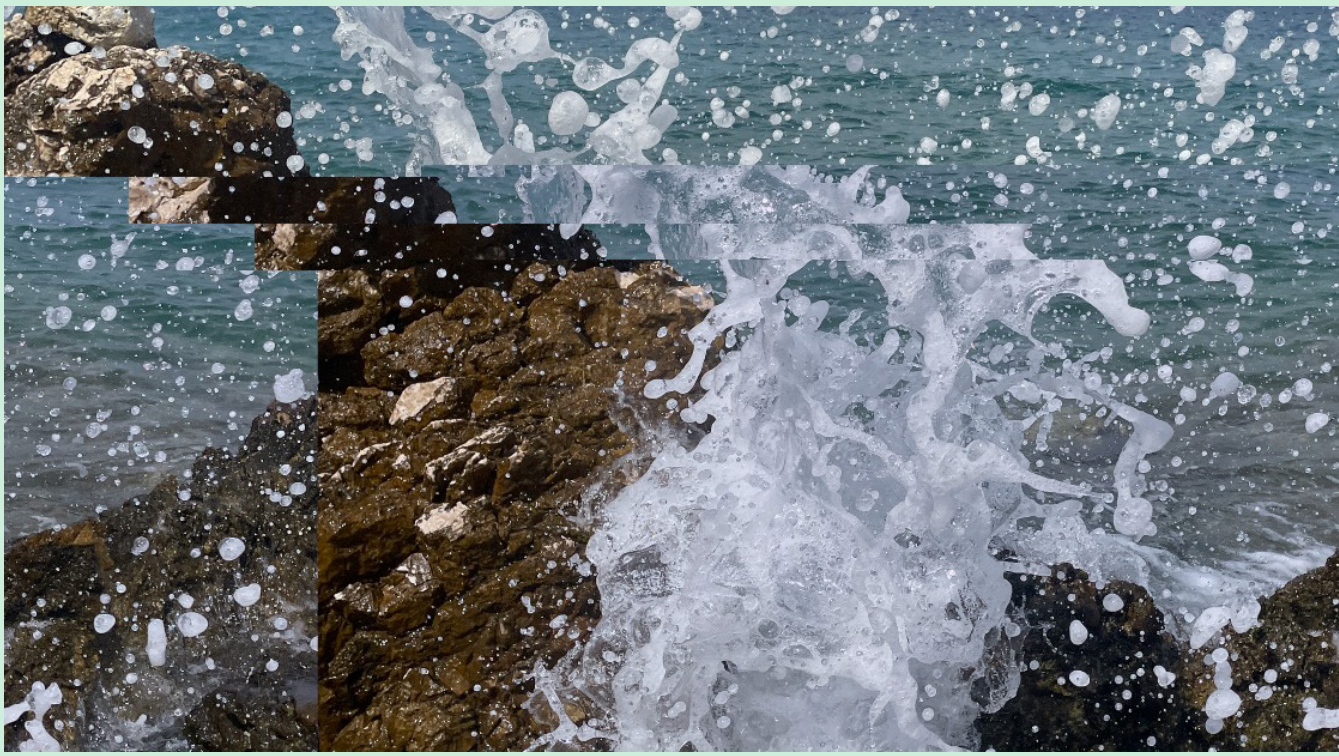
A Littoral D*i*sson*a*nce

Alteration of the Croatian Adriatic as a Consequence of Tourism Practices



Vera Vince

MSc Urbanism

Graduation Thesis

Colophon

A Littoral Dissonance
Alteration of the Croatian Adriatic as a Consequence of Tourism Practices

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Sources for additional data are mentioned within the page and at the end of the report.

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Finally, I dedicate this thesis to my late grandfather Josip, who motivated me to pursue these studies and instilled in me the importance of learning, care for others and a great love of nature.

Abstract

This thesis interrogates the transformation of the Croatian coast, focusing on its identity beyond a touristic destination and examining the social and ecological impacts of tourism. The research poses crucial questions about the true character of the Croatian coast, the spatial elements introduced by tourism, and the resultant dissonances, as well as the role of urbanism and policy in these processes. Employing the proposed *"threads"* method, this project traces and harmonizes dynamic processes across diverse systems and timescales, revealing interactions between more-than-human, human, and tourist perspectives. It emphasizes the ecological roles of elements like Posidonia oceanica meadows and the socio-economic importance of traditional practices. Conducted in Njivice on Krk island, the study proposes three main mechanisms for harmonisation: Protocols of Care and Repair, Regulative Actions, and Spatial Transformations. Care and Repair protocols derive from interdisciplinary research, informing stakeholders and guiding policy. Regulative Actions transform these protocols into planning and legislative measures, while Spatial Transformations apply these principles to physical spaces. This culminates in the *sympoiesis of attraction*, addressing the paradox where tourism's allure simultaneously threatens its foundation, aiming to realign and harmonize the coast's multifaceted landscape.

Personal Motivation

This thesis aims to highlight the intricate relationships of the Adriatic Sea and its coast, often commodified today, overlooking their value for local people and visitors. Recently, this point became very personal to me. The beach in front of my family's house, where generations of my friends and family learned to swim, socialize, or simply relax on familiar rocks, was significantly altered.

The transformation began in 1962 when it was decided that Njivice, a small fishing village with adjoining oak forests, would become a vacation town. Njivice is located on the island of Krk, one of Croatia's largest islands, which sits close to the coast. Krk was always fairly accessible via a short ferry ride but was connected to the mainland by a bridge in 1980, making it the closest island to both Rijeka and Zagreb. This new connectivity, along with the network of highways, brought in many foreign guests. With projects like the Haludovo hotel complex appearing across the island, Krk soon became one of the most visited places in the country.

Our beach's rocks were broken and thrown into the sea to make way for a wider path, allowing tourists carrying floaties, riding electric scooters and bikes, and delivery vans for beach bars to move easily. From June until September, one hears hundreds of voices, children playing, boats towing parachuters, and Croatian '90s hits blasting from the bars. After September, the ambiance changes. The sounds of wind blowing from the channel, waves crashing on the rocks, seagulls calling from the sea, and birds singing in the trees become more noticeable. These natural sounds are always present but grow quieter each summer as the tourism season gets louder.

Wondering and fearing what sounds the new path will bring, I dedicate this thesis to the beach. The processes that shaped the beach have also shaped me. This thesis explores the purpose and nature of that reshaping and its implications for the future.

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I. PRELUDE

a full score in music, which shows all the parts of a musical arrangement or composition together on one page or set of pages, allowing the conductor or reader to see the complete orchestration and how the individual parts interact (Kenyon, 1988).

I.I Discovery

Introduction

This thesis critically examines the transformation of the Croatian coast under the influence of tourism, exploring its multifaceted identity beyond the typical touristic veneer and assessing the resultant socio-ecological and spatial impacts. It addresses several pivotal questions regarding the real nature of the Croatian coast, the specific spatial elements that tourism introduces, and the resulting dissonances. Moreover, it evaluates the role of urbanism and policy in these transformative processes.

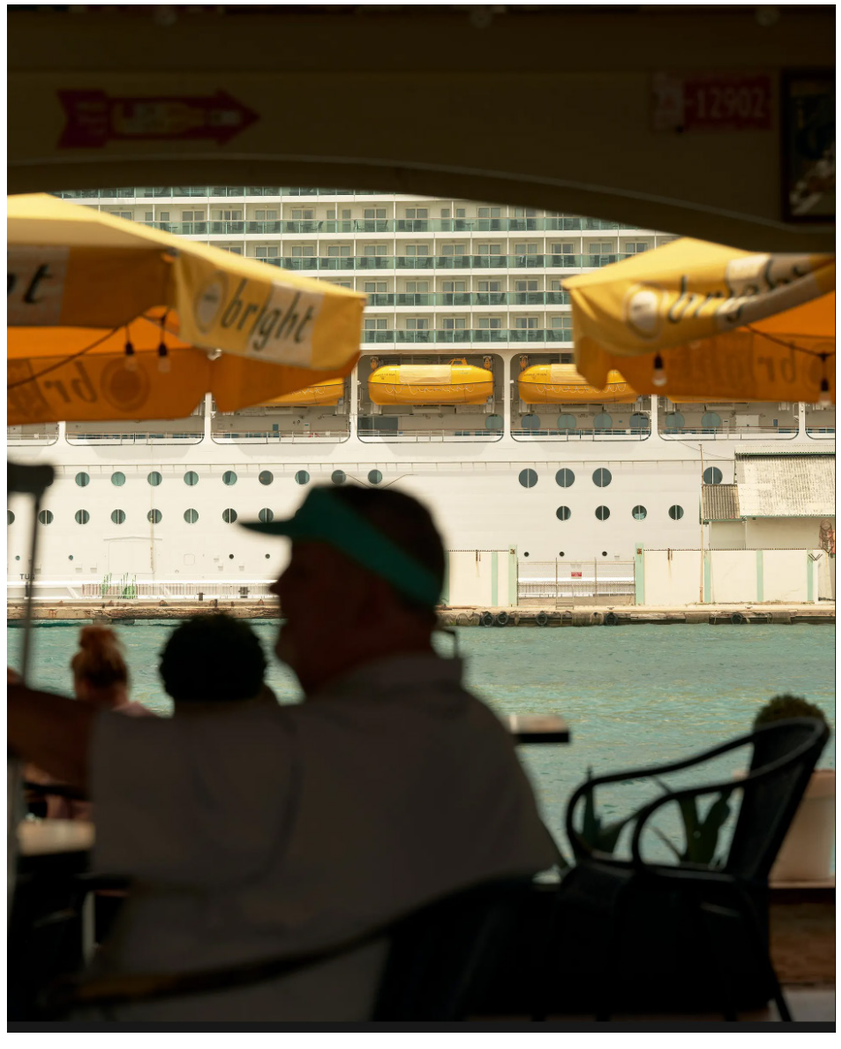
Utilizing the innovative “threads” methodology, the study meticulously traces and seeks to harmonize complex, dynamic processes across various systems and timescales. This method integrates multiple perspectives—more-than-human, human, and tourist—to reveal their simultaneous interactions and the spatio-temporal effects these interactions engender. Key environmental features such as Posidonia oceanica meadows and socio-economic aspects like traditional fishing practices are examined for their roles within this framework.

The research is structured into several distinct sections.
The Prelude establishes the theoretical and methodological framework, setting the stage for a deep dive into the core issues and defining the research questions. Partiture, deconstructs and analyzes the different elements influenced by tourism. It explores the coastal landscape’s bio-physical patterns, the interpolation of tourism within these patterns, and the resultant dissonances. Each chapter—Assonance, Countermelody, and Dissonance—uses a musical metaphor to illustrate the harmony and conflict between the natural landscape and touristic development.

Permutation, the projective part, proposes solutions to the identified dissonances. It begins with Inversion, redefining the issues and proposing a shift in perspective. Harmonisation then operationalizes these findings, detailing mechanisms for aligning conflicting interactions and proposing specific actions for spatial transformation. Resolution, the final chapter, synthesizes the outcomes and demonstrates how the proposed interventions could be implemented on a broader scale. Coda is the final part of the thesis, disclosing its relevance, reflection and references.

The thesis culminates in proposing three primary mechanisms for achieving harmonisation: Protocols of Care and Repair, Regulative Actions, and Spatial Transformations. Protocols of Care and Repair are derived from interdisciplinary research and inform continuous stakeholder engagement, guiding policy and planning. Regulative Actions transform these care protocols into concrete legislative measures. Spatial Transformations apply these principles physically, reconfiguring spatial elements to foster harmony between environmental and social systems.The application of this framework is demonstrated in the touristic town of Njivice on Krk Island, focusing on how various scales of intervention—from individual sites to the entire island—can be harmonized to address the paradox of attraction. This paradox highlights how tourism’s draw, while organizing spatial elements, simultaneously threatens the ecological and social foundations it relies on. The sympoiesis of attraction aims to realign these elements, ensuring the coast remains a viable destination, home, and habitat. This comprehensive approach not only addresses immediate dissonances but also sets a precedent for effective coastal management practices.

Problem Discovery



Tourism and the Anthropocene

The concept of the Anthropocene reflects the epoch where human activity became the dominant influence on climate and the environment. In this context, the tourism industry emerges as a quintessential example of anthropogenic impact, representing both the Anthropocene and Capitalocene, the latter term emphasizing capitalism's role in shaping Earth's systems (Katsikis & Brenner, 2020). Tourism, rapidly evolving into a mass phenomenon, demonstrates how human desires and economic forces can reshape landscapes and ecosystems on a vast scale. Its transformation into a mass activity, now existing at least half as long as the industry itself, illustrates a key aspect of the Anthropocene. It involves not only the movement of people to experience different places but also the continuous modification of these environments to sustain and enhance tourist experiences. This phenomenon aligns with Baudrillard's theory of Simulation and Simulacra, where the replication or simulation of reality becomes a reality in itself (Baudrillard, 1994). In the tourism context, destinations are often modified to create idealized versions of themselves, catering to tourist expectations and perceptions.

Moreover, tourism can be viewed through Morton's concept of a 'hyperobject' – entities massively distributed in time and space relative to humans (Morton, 2013). Tourism, as a hyperobject, encompasses a vast network of interactions and impacts that extend beyond local environments, influencing global ecological and social systems. This extensive reach and the complex, often contradictory, relationship tourism maintains with its host environments underscore its role in the Anthropocene narrative. However, this incessant spatial transformation for tourism, striving to maintain the industry's allure, creates a dissonant relationship between various spatial elements and processes. As climate change exacerbates these tensions, the sustainability of both anthropogenic and bio-physical systems becomes increasingly precarious. The challenge is to navigate this complexity, ensuring tourism's viability without overstepping the delicate balance of the natural and human-made worlds.

PRELUDE

Situating the East Adriatic

The Croatian Coast is situated on the East side of the Adriatic sea, which is essentially an extension of the Mediterranean Sea, enclosed by the Appenine Penninsula on the West, and the Balkan Penninsula on the East. Compared to the rest of the Mediterranean, the Adriatic is known for its shallowness, especially in the northern part near the Po River delta. This shallow northern basin, contrasting with the deeper central and southern Adriatic, significantly affects the sea's hydrodynamics, temperature gradients, and salinity levels. The geological frame surrounding the Adriatic, including the imposing Dinaric Alps to the east and Alps further north, shapes the region's climate and hydrology. These mountain ranges not only influence local weather patterns but also play a critical role in the hydrological cycles, feeding rivers that eventually find their way to the Adriatic.

Rivers, particularly the Po from the Italian coast, pour vast quantities of freshwater into the Adriatic, influencing the ecological and sedimentary dynamics of the northern basin. The riverine inputs significantlly cool down the sea water temperature and lower the salinity level of the sea, which, coupled with the sea's shallowness, fosters unique ecosystems and plays a pivotal role in the sedimentation processes along the coast. Another element dictated by the potent freshwater inflow from the Po, Neretva and Drina rivers, as well as strong North wind patterns are the currents. Currents in the Adriatic are primarily driven by wind, density differences, and the shape of the basin. The general circulation sees surface currents flowing up the eastern coast, circling down along the western coast towards the Ionian Sea in the south. This significantly impacts sediment flow within the Adriatic, further defining coastal and marine conditions of the Croatian Coast (Croatian Hydrographic Institute, 2020).

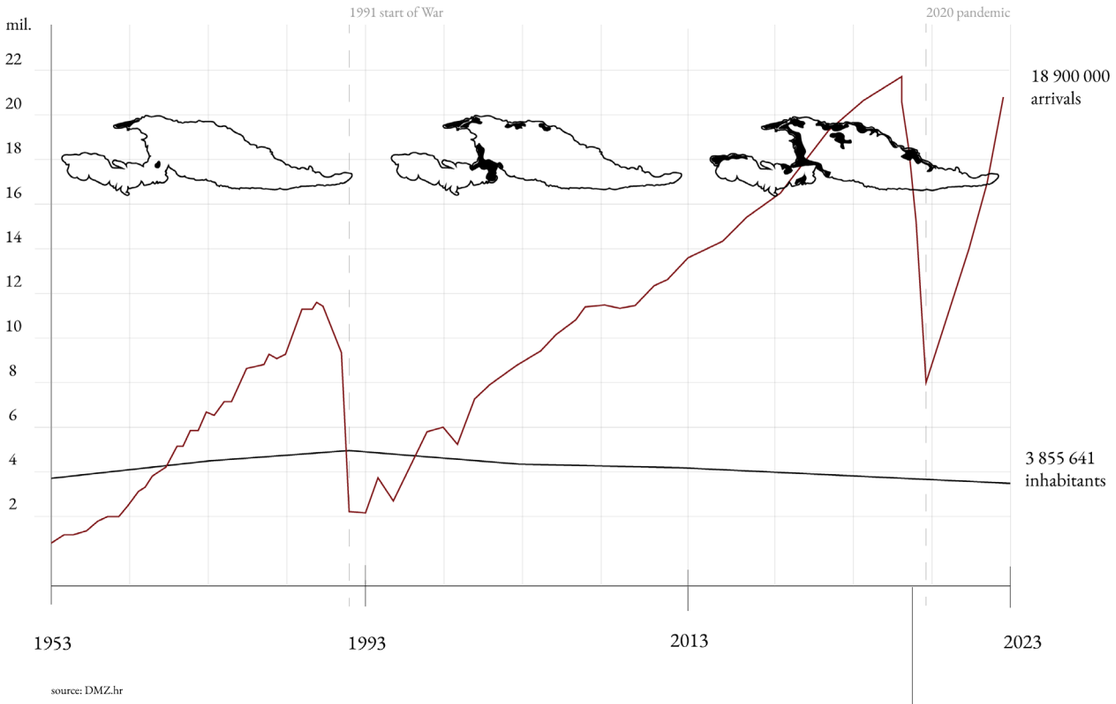
Problem Discovery

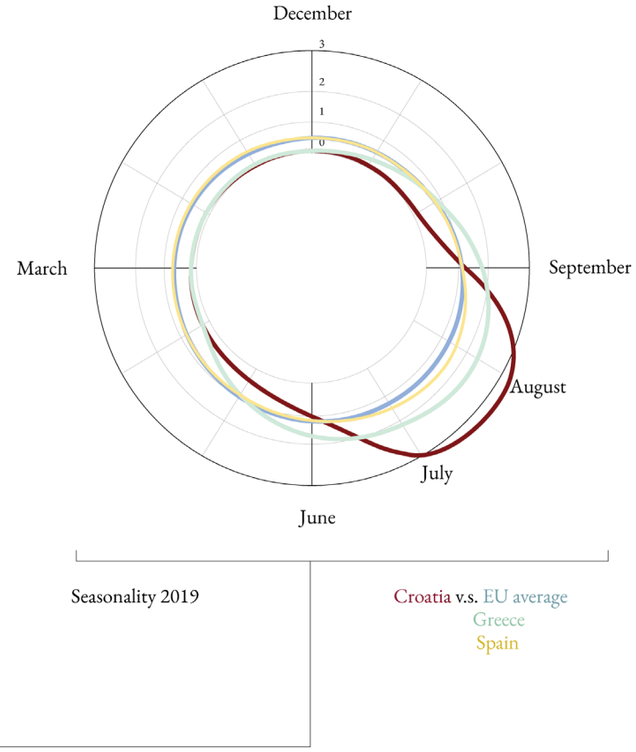
Croatia - Full of Life?

Croatia's tourism narrative, encapsulated by its slogan "Croatia - Full of Life," presents a paradox within the context of its growing tourism industry and the accompanying environmental challenges. The country is renowned for its rich natural and cultural heritage, which has become the cornerstone of its tourism appeal (Hall, 2017). From the pristine waters of the Adriatic Sea to the historic walls of Dubrovnik, Croatia's allure lies in its diverse landscapes and cultural depth. This dual offering has positioned it as a coveted destination within the global tourism market.

The slogan "Croatia - Full of Life" not only signifies the vibrancy and diversity of experiences that the country offers but also subtly underscores the vibrancy of its natural ecosystems and cultural traditions (Ministry of Tourism and Sports, 2021). However, this promise of 'life' is increasingly under threat from the very industry that celebrates it. The rapid expansion of tourism, particularly in coastal areas and historic cities, has led to concerns about ecosystem damage and loss of biodiversity, raising questions about the sustainability of this growth trajectory (Jones & Phillips, 2017).

The irony of the situation is that while tourism seeks to showcase Croatia's 'fullness of life,' it simultaneously accelerates a gradual loss of this vitality through environmental degradation. This includes pressures on marine ecosystems, over-tourism in sensitive cultural sites, and the disruption of local communities' lifestyles (Đurkin & Perić, 2018). The challenge for Croatia is to balance the economic benefits of tourism with the need to preserve its natural and cultural assets, ensuring that the slogan "Full of Life" remains a living reality and not a fading promise.





The increasing influx of tourists to Croatia, juxtaposed with the exodus of local residents, presents a critical demographic challenge. This phenomenon, marked by a significant rise in tourist arrivals, has coincided with a notable decrease in the resident population, particularly in coastal areas and islands (Njavro, M., & Kurečić, P., 2021). The growing trend of urbanisation along the coast and on islands, driven by tourism development, has led to the creation of 'ghost towns' - areas bustling with activity during the tourist season but virtually deserted otherwise.

This extreme seasonality in tourism exacerbates the situation, creating pressures on local infrastructure and resources during peak months, followed by periods of stark inactivity. This seasonal dynamic contributes to the population decline, as it diminishes the quality of life for residents and leads to a reliance on an economy that is active only part of the year (Richards, G., & Marques, L., 2018). The significant demographic changes, coupled with the environmental impacts previously discussed, underline the urgency of rethinking tourism development in Croatia. Aligning with the research question, this situation poses a critical inquiry into how sustainable tourism can be balanced with maintaining the vitality of local communities and preserving the natural and cultural assets that originally attracted visitors to the region.

I.2 Framework

I. Problem and Research Question

II. Methodological Framework

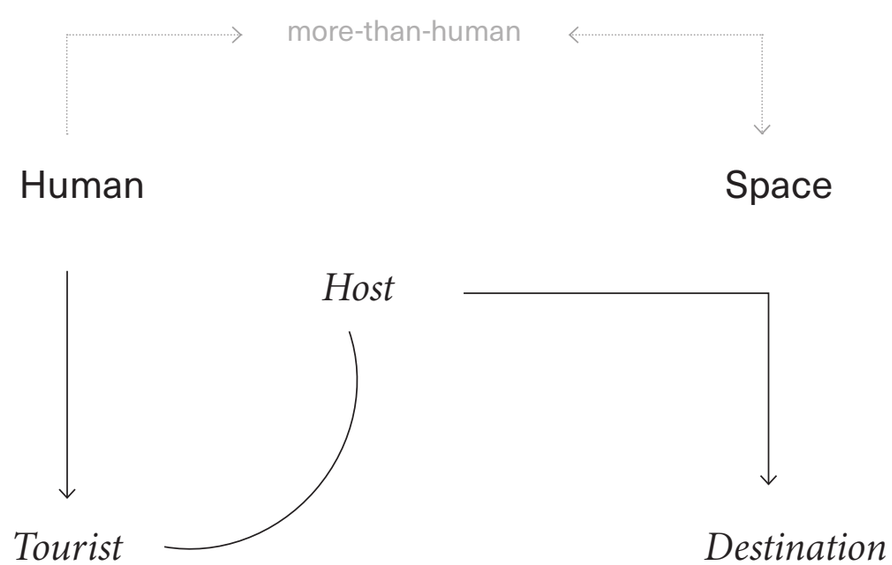
III. Theoretical Framework

Problem Statement

The constant transformation of space required by tourism to create a perfect simulation of a tourist destination has led to the current situation in which various spatial elements and processes exist in a dissonant relationship. The progressive nature of this dissonance, intensified by the effects of climate change, threatens to push the limits of multiple systems, including both anthropogenic and bio-physical.

Research Question

How do tourism-driven spatial transformations along the Croatian Coast engender dissonance and system breakdown of more-than-human and human elements and how can we harmonize these processes and achieve coexistence in the face of climate change and over tourism-induced vulnerabilities?



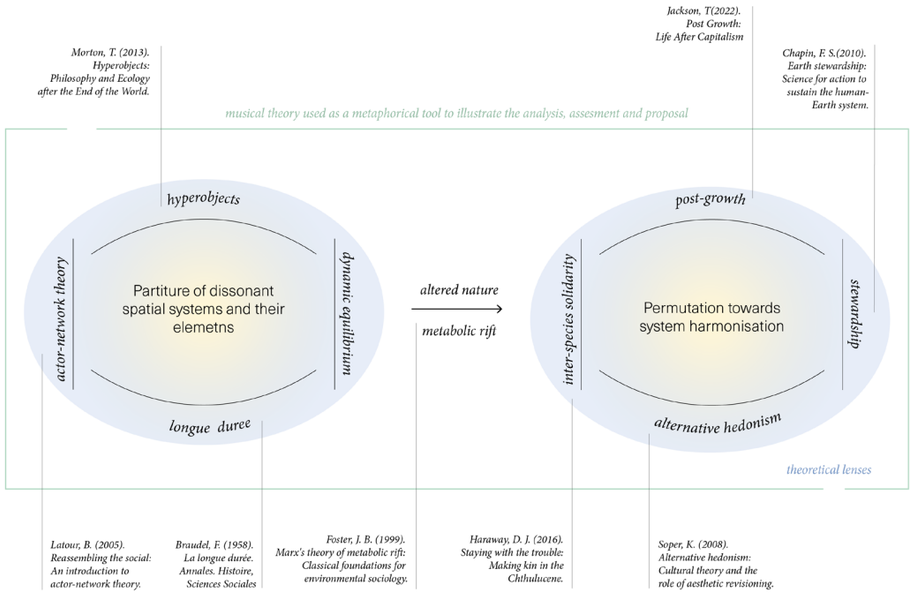
Methodological Framework: Research Cluster

Cluster	Sub-research Question	Method	Input	Outcome
1. Assonance	*What are the permanent biophysical characteristics of the Croatian Coast?*	Literature Review Critical Cartography	*Maps, images and information about the spatial layers of more-than-human systems.*	Disclosure of the **spatial elements** upon which motivated tourism and with which it is in dissonance
	How has human influence transformed the area?	Literature Review Critical Cartography	*Maps, images and information about the spatial layers of more-than-human systems.*	
2. Countermelody	*How and why does tourism, a socio-economic phenoena, reshape the semantics of the material plane?*	Literature Review	*Information about the ontology and history of tourism.*	Disclosure of the **specific spatial needs and transformations** introduced by tourism
	How do specific spatial elements generate and reorganize tourism-related spatial structures and dynamics?	Literature Review Spatial Identification and Analysis	*Overview of the types and impact of attraction, mobility infrastructure and accommodation for tourism.*	
3. Dissonance	*What constitutes a spatial dissonance?*	Literature Review Critical Discourse Analysis	*Critical discourse positioning simultaneity and uncertainty and the current institutional response in the context of dissonance.*	Disclosure of the **paradox between the current paradigm and ongoing progression towards systems collapse**.
	What are the systems enabling the current dissonant condition of tourism related spatial transformations?	Stakeholder Analysis Policy Review	*Overview of the governance and policy approach which relate to tourism and/or contribute to dissonance.*	

Methodological Framework: Projective Cluster

Permutation type	Sub-research Question	Method	Input	Outcome
3. Inversion	*How can make a shift towards capturing the situated spatio-temporality and motives of different systems which lead to dissonance?*	Literature Review Critical Discourse Analysis Speculative Method Design	*Elaboration on the need and role of a paradigm shift, as well as a proposition of theoretical approaches which hold potential to remendy the dissonance. Proposal of an alternative spatial reading which works to predict and harmonise spatial dissonance.*	**Theoretical underpinning supporting the paradigm shift** towards stewardship, degrowth and alternative hedonism, along with a **new analytical method approach for understanding spatio-temporalities.**
4. Harmonisation	*What are the mechanisms and actions which would harmonise a coastal territory?*	Policy Design Spatial Planning Design Experiments Scenarios	*Elaboration on the proposed mechanisms which would provide harmonisation. Information on selected area and experimental drawings showcasing harmonisation and testing it for a future scenario.*	**Experimental design and planning project** re-configuring the main spatial elements within the proposed paradigm shift aiming for system harmonization.
5. Resolution	*How can these proposals be operationally implemented and what is the resulting condition?*	Application Pathway Design	*Scheme and description of possible implementation of a new research, policy, planning and design paradigm.* *Summary of the outcome.*	**Speculative implementation pathway** supporting the paradigm switch, along with the proposed methods, mechanisms and transformations.

Theoretical Framework



The complex processes of spatial transformations caused by tourism on the Croatian coast are explored using a metaphor from musical theory. This analysis approach is akin to partitioning a symphony, where various theoretical perspectives harmonize to offer a comprehensive understanding of the subject, after which the music is permutated to harmonise that which is dissonant.

The longue durée perspective (Braudel, 1958) serves as the foundational perspective, emphasizing historical continuities and the slow-moving forces shaping the region over centuries. This approach allows for a deep understanding of the enduring structures influencing the present tourism landscape. Complementing this, Timothy Morton's concept of hyperobjects (Morton, 2013) adds a layer of complexity, highlighting phenomena like climate change and their massive, distributed impact on the region, much like a powerful leitmotif that recurs throughout a musical piece. Dynamic equilibrium and Actor-Network Theory (Latour, 2005) introduce counterpoints, examining the balance and interaction within the socio-ecological system. These theories emphasize the intricate web of relationships, akin to a complex harmony, where every element, whether human or non-human, plays a critical role in the overall composition.

Upon recognizing the altered nature of the environment and the socioecological metabolic rift (Foster, 1999), the thesis shifts its focus. It adopts a lens inspired by alternative hedonism (Soper, 2008), which critiques the unsustainable consumer culture prevalent in tourism. This perspective calls for a redefinition of pleasure, aligning it with environmental sustainability, much like revising a musical theme to introduce a new narrative. Post-growth theory (Jackson, 2009) further enriches the framework, suggesting a shift from traditional economic growth models to more sustainable, equitable practices. This theory introduces a variation in the thematic development, advocating for a transformation in the way tourism impacts the region. Stewardship (Chapin et al., 2010) and inter-species solidarity (Haraway, 2016) emphasize the need for responsible management of natural resources and harmonious coexistence between humans and other species.

II. PARTITURE

a full score in music, which shows all the parts of a musical arrangement or composition together on one page or set of pages, allowing the conductor or reader to see the complete orchestration and how the individual parts interact (Kenyon, 1988).

II.I Assonance

the repetition of vowel sounds or similar-sounding notes within close proximity, creating a form of sonic rhyme or pattern (Kennedy, 2006).

I. More than Human

Climate

Geomorphology

Hydrology

Biodiversity

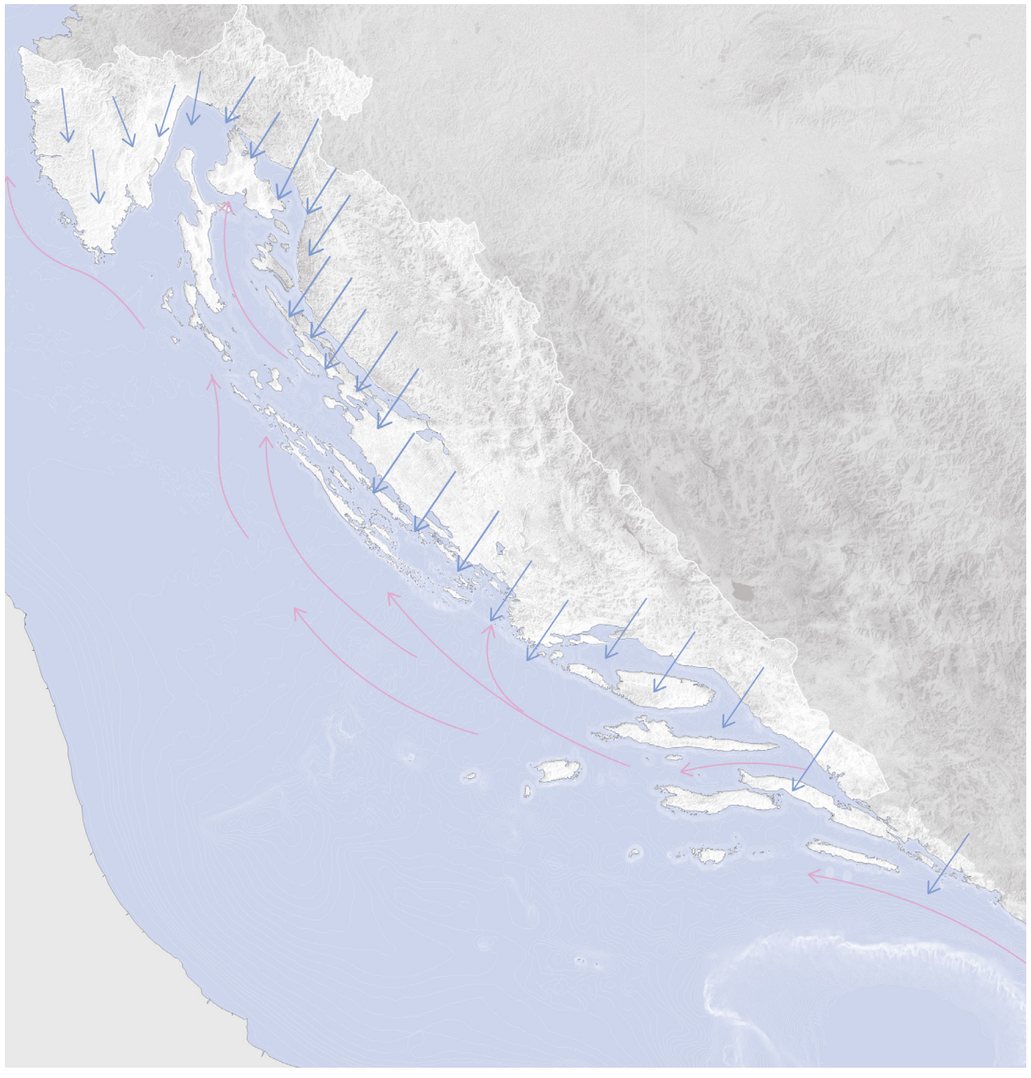
II. Human

Coastal Landscapes

Settlements and Infrastructure

Assonance

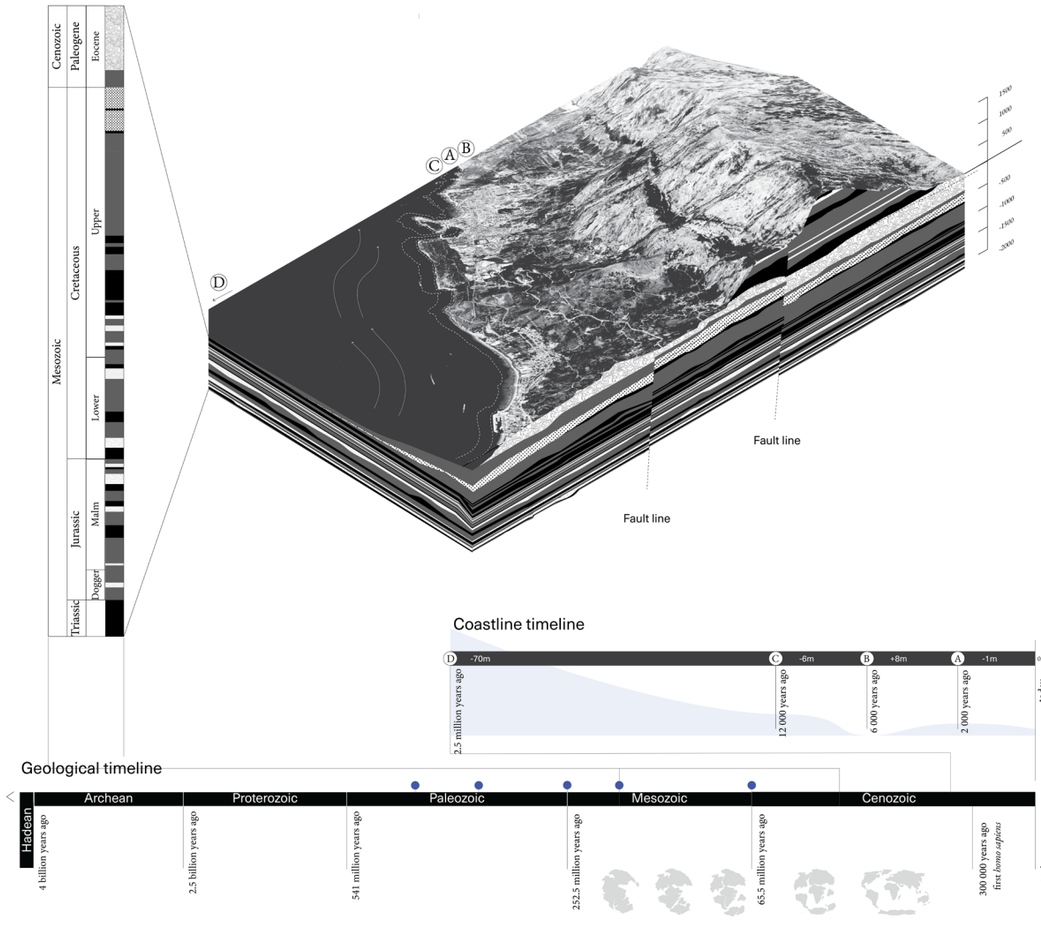
This chapter discloses the Croatian coast's subtle, yet per- sistent patterns that resonate through its cycles, bio-physical patterns, and local morphology. Employing 'longue durée' (Braudel, 1980), this exploration transcends the immediacy of events, revealing the rhythmic motifs and harmonies that have shaped the coastline across centuries. Here, assonance becomes a metaphor for the region's inherent symphony— echoing the compatibility and recurrence of natural rhythms and interactions. This rich, textured backdrop sets the stage for a nuanced understanding of the impacts of tourism. By appreciating these deep-seated patterns of assonance, we can critically examine and understand the discordant notes introduced by tourism-led spatial transformations, offering a foundational canvas of the area before the interpolation of these new dynamics.



Climate

The climate along the Croatian Adriatic Coast is predominantly Mediterranean, with several microclimatic variations due to the region's diverse topography, the presence of the Adriatic Sea, and varying wind patterns. The northern part of the coast, closer to the Istrian peninsula, experiences a climate with more continental influences, resulting in cooler temperatures and higher rainfall. In contrast, the southern Dalmatian coast enjoys a warmer, drier climate, typical of the Mediterranean.

The Bura and Jugo winds are significant climatic phenomena, each leaving a distinct mark on the coastal region. The Bura (Bora) is a cold, northerly wind. It is known for its strong gusts, especially in the Velebit Channel, bringing clear skies but also sometimes gale-force conditions. Its influence is evident in the region's vegetation patterns, cultural and agricultural practices (several foods are dried in Bura winds, obtaining a specific aroma), and even in the architecture, with buildings designed to withstand its force. The Jugo (Sirocco), originating from the Sahara, brings warmth and moisture. This wind affects air quality and can bring heavy rains, leading to flooding but also benefiting the arid southern regions by replenishing water reserves. Its impact is also seen in coastal erosion and the deposit of Saharan dust, which can influence soil fertility and, consequently, local agriculture. The Jugo is said to affect health and general mood of locals, so much so that there are many historical anectodes about local governments even pardoning crimes if they were committed during Jugo (Shalleck & Munuz, 2008). The area also showcases distinct seasonal patterns. Summers are notably hot, with air temperatures between 25°C to 30°C, and sea temperatures pleasant at 20°C to 27°C. The Bura wind occasionally introduces cooler air. Autumn transitions to milder air temperatures of 15°C to 20°C and sea temperatures around 20°C, with the Jugo occasionally bringing wetter conditions. Winters are mild, air temperatures hover between 5°C to 10°C, and the sea averages 12°C to 14°C, with the occasional Bura storms, sometimes even bringing snow. Spring sees a warming trend, air temperatures reaching up to 20°C, and sea temperatures rising to 16°C (Croatia's Meteorological and Hydrological Service, 2021).



PARTITURE

Geomorphology

The geomorphology of the coast is largely influenced by the interplay between tectonic forces and different erosive processes. This area, especially along the Dinaric Alps, is a zone of complex tectonic activity due to the interactions between the Eurasian and African plates. These tectonic movements have significantly shaped the landscape over millions of years, resulting in the formation of rugged mountains, extensive karst landscapes, and numerous islands along the coastline. The karst topography, predominantly found in the Dinaric Alps, is primarily composed of limestone, originating from the accumulations of marine organisms' skeletal deposits. This limestone terrain is highly susceptible to erosion by water, leading to the formation of distinctive features such as sinkholes, caves, and underground river systems.

These features are particularly evident in areas like the Velebit and Biokovo mountain ranges. In addition to the karst processes, tectonic uplift has played a crucial role in shaping the region. It is responsible for the emergence of several islands, such as Krk and Brač. These islands are mainly made up of limestone and dolomite and have undergone significant changes due to tectonic movements, sea-level variations, and erosion. For instance, the shape of Zlatni Rat beach on Brač island is continually modified by wind and sea currents. The northern part of the coast, particularly the Istrian peninsula, displays a different geomorphological profile. Compared to the stark karst landscapes of the south, Istria's terrain is composed of softer rocks like flysch, alongside limestone, resulting in less rugged and more gradual landscapes, characterized by red soil (Croatian Geological Institute, 2019).

The region's geological dynamics are also marked by seismic activities, a direct result of the tectonic forces at play. Cities such as Dubrovnik and Rijeka have experienced significant earthquakes throughout history. These seismic events have not only influenced the physical landscape but also the architectural and urban development patterns, playing a significant role in shaping the region's cultural and historical fabric.

Assonance

Lake Jezero on Krk Island

Hydrology

Croatia stands out on a global scale for its remarkable ratio of land surface to underground water resources. Also, when it comes to water resources available per capita, Croatia ranks third in Europe. The hydrology of the country is separated into two main catchment basins. The Adriatic catchment basin, although very rich in underground water system, has less surface water, in comparison to the continental Black Sea catchment basin. Nevertheless, there are several important rivers flowing into the Adriatic, notably the Krka, Neretva and Cetina in the south, as well as Mirna and Raša in the north. These rivers are defined by their relationship with the geomorphology and the sea. Originating from the Dinaric Alps or Istrian hinterland, these rivers influence the landscape and support ecosystems and agricultural landscapes. Lakes can be found throughout Croatia, though they tend to be on the smaller side. The country boasts a variety of these water bodies, with the largest natural one being Vransko, near Biograd, covering an area of 30.7 square kilometers. However, the world-renowned Plitvice Lakes in Lika are perhaps the most famous, known for their picturesque beauty (Croatian Waters, 2020).

The coastal area faces droughts and floods, largely due to its Mediterranean climate and human factors like land use changes. Droughts are more frequent during the hot, dry summers, particularly impacting the islands and the Dinaric hinterland. Floods occur mainly in autumn and winter, driven by intense rainfall events, sometimes exacerbated by the *Jugo* wind bringing moist, warm air. Historically, the region developed various water retention systems to manage the irregular water supply. Traditional systems, such as stone-built cisterns and small dams, were common, capturing and storing rainwater for agriculture and domestic use. These systems, particularly prevalent in karst areas where water quickly percolates through the porous ground, highlight the ingenuity in adapting to the challenging hydrological conditions. Nowadays, there are several artificial reservoirs constructed to meet the demands of hydroelectric power plants. Among these, Perućko Lake (with an area of 13 square kilometers) situated on the Cetina River, is one of the largest reservoirs in the country (Croatian Hydrographic Institute, 2020).

Sheep in maquis shrubland

Biodiversity and Ecosystems

The Croatian Coast's ecology is characterized by diverse terrestrial and marine ecosystems, each contributing significantly to the region's biodiversity and ecological services.
On land, the maquis shrubland and pine forests dominate the landscape. The maquis, composed of dense evergreen shrubs like myrtle, juniper, and holm oak, is adapted to the dry, summer conditions. These shrubs, along with the Aleppo pine forests, are not only critical for preventing soil erosion but also play a significant role in carbon sequestration. These areas are habitats for various species, including endemic ones like the Dalmatian Pyrethrum, known for its insecticidal properties.

In marine environments, the noble pen shell, a large bivalve mollusk, serves as an indicator of a healthy marine ecosystem. The presence of this species signifies clear, unpolluted water. The Posidonia oceanica, a seagrass species, forms underwater meadows that are biodiversity hotspots. These meadows stabilize the seabed, cycle nutrients, and store carbon. They also serve as nurseries for fish and other marine life, including endangered species like the loggerhead turtle. The coastal waters are rich in marine life, including a variety of fish species, cephalopods like octopus and squid, and crustaceans. Coral communities, although not as extensive as in tropical regions, add to the biodiversity. On land, the region supports a range of bird species, particularly in wetland areas like the Neretva Delta, which is an important stopover for migratory birds (Croatian Ministry of Environment and Energy, 2021).

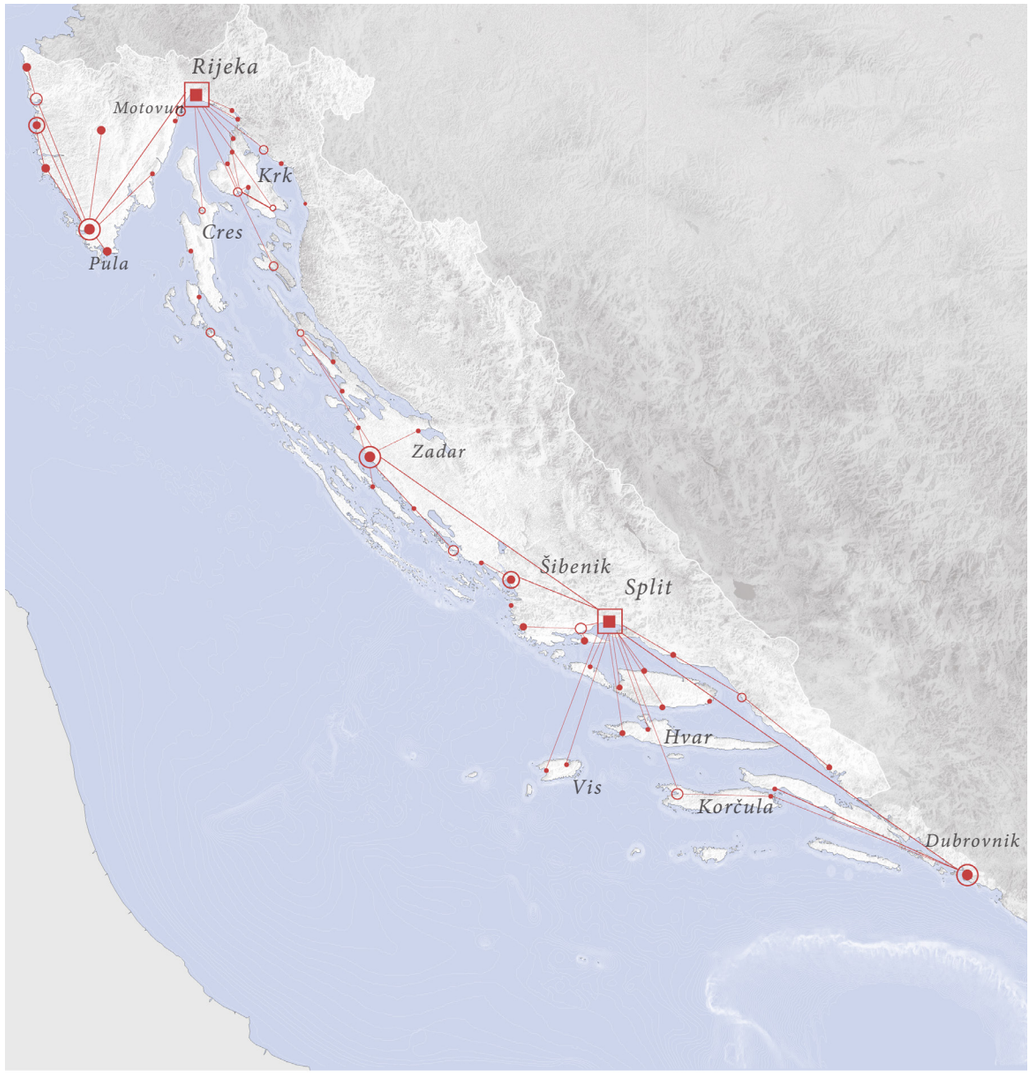
Human

Coastal Landscapes

The region comprises a variety of distinct landscapes, each with its own unique features, from the northern Istrian Peninsula to the northwest Zadar archipelago. These regions offer a combination of cultural and environmental attractions.

Istria, located in the northwest, is known for its rolling hills, vineyards, olive groves, and a blend of Italian and Croatian influences in its coastal towns. The region is famous for culinary delights like truffles and fine wines, enhancing its natural beauty. Kvarner Bay, situated further south, presents a contrast between its coastal and inland landscapes. Along the coast, there are rugged cliffs, islands such as Krk and Cres, and resort towns. Inland, Kvarner features lush forests and the Gorski Kotar mountain range. North Dalmatia combines cultural heritage and natural beauty, featuring cities like Zadar with Roman and Venetian influences and the imposing Velebit mountain range. The Zadar archipelago sits on the sea-side of North Dalmatia, and presents a distinct landscape group.
, mostly due to the Kornati Islands National Park, known for their rocky islets and clear waters.

Middle Dalmatia offers diverse landscapes, from the limestone cliffs of the Makarska Riviera to the serene islands of Brač and Hvar. The region is home to Krka National Park, famous for its waterfalls and lush forests The Neretva Delta region, where the Neretva River meets the Adriatic Sea, is recognized for its mandarin orchards, waterways, and cultural traditions. Finally, South Dalmatia boasts the historic city of Dubrovnik, a UNESCO World Heritage site, with medieval architecture.



Settlement and Infrastructure

The Croatian Adriatic Coast boasts a rich tapestry of human history, characterized by a diverse array of cultural and historical influences. This region has witnessed the rise and fall of various civilizations, each leaving its indelible mark. The ancient Liburnians, known for their seafaring skills, laid early foundations, followed by the profound architectural and urban contributions during Roman rule. The Venetian era brought a distinct architectural style and urban organization, still visible in cities like Split and Dubrovnik. The arrival of the Croats added another layer, further enriching the region's cultural mosaic.

Archaeological findings, such as those at Vela Špilja, provide evidence of human presence dating back to prehistoric times, underscoring the region's long-standing role as a human habitat. The urban layouts of coastal cities demonstrate a blend of Roman urban planning with medieval influences. Split's Diocletian's Palace is a prime example, showcasing Roman architectural prowess, while Dubrovnik's medieval walls reflect later strategic urban defense systems. The rural landscape is marked by traditional parcelation patterns and the use of dry stone walls, an agricultural practice adapted to the region's karst terrain. These walls, used for terracing and boundary marking, are a testament to the adaptation strategies developed in response to the geomorphological and hydrological challenges of the region.

The strategic positioning of settlements along the coast and the islands, the design of intricate water management systems, and the specific agricultural practices reveal a deep understanding of the local environmental conditions. This multi-layered historical narrative of urbanisation and adaptation along the Croatian Adriatic Coast illustrates a continuous interaction between human society and the natural environment.

II.2 Countermelody

a secondary melody played in conjunction with the main melody, often providing contrast or complementing the primary tune (Kennedy, 2006).

Countermelody

In this chapter, we delve into the interpolation of tourism within the Croatian coast, akin to a countermelody in a musical composition. Just as a countermelody weaves through the primary tune, adding depth and complexity, tourism's spatial transformations—through attractions, transportation, and accommodation—intertwine with the region's landscape and cultural fabric. This chapter explores how these elements of tourism integrate with the existing environmental and socio-cultural motifs of the coast, creating a tune of change and interaction, but also leading us towards dissonance.

Tourism

Travel v.s. Tourism

Travel, the act of moving from one place to another, has been a fundamental aspect of human experience, laying the groundwork for the emergence of tourism. Historically, travel was driven by various needs such as trade, exploration, pilgrimage, and education. These journeys necessitated the development of essential infrastructure, including roads, inns, and later, railways and airports, to facilitate movement and accommodation. Even though tourism has a lot in common with traveling, including many of the structures, in travel - moving from point A to point B is determined by a need or wish for something that the journey provides, not the point B itself.

The evolution from travel to tourism marked a fundamental shift in motivation. While traditional travel focused on reaching a destination for specific purposes like trade or pilgrimage, tourism centers on the destination itself as the primary allure. In tourism, attractions become the primary motivators, drawing visitors not for necessity, but for the experience they offer. Initially, tourism was a luxury for the aristocracy, centered around health tourism and socializing in exclusive resorts. However, it was the advent of workers' rights, particularly the right to vacation, that catalyzed tourism's transformation into a widespread industry. This democratization of travel allowed a broader population to engage in leisure travel, expanding tourism beyond elite circles and laying the foundation for its current global scale and economic significance.

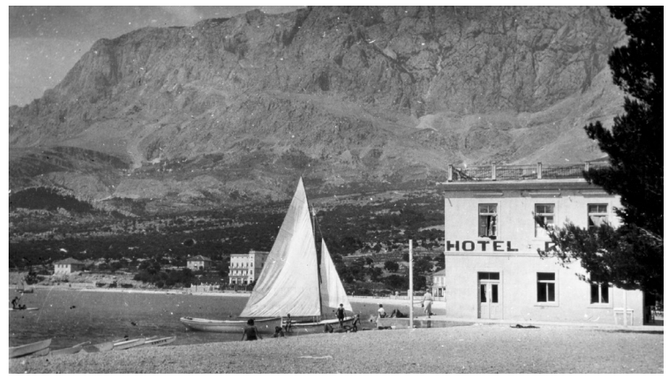
PARTITURE

Emergence of Coastal Tourism

Initially, vacationing was done during winter and coastal areas were primarily visited for their health benefits, with sea bathing and fresh air being prescribed for various ailments. This trend began in the 18th century and gained momentum in the 19th century, especially among the European aristocracy. The development of coastal tourism was closely linked to the broader evolution of tourism as a leisure activity, influenced by the growing accessibility provided by advancements in transportation, particularly railways.

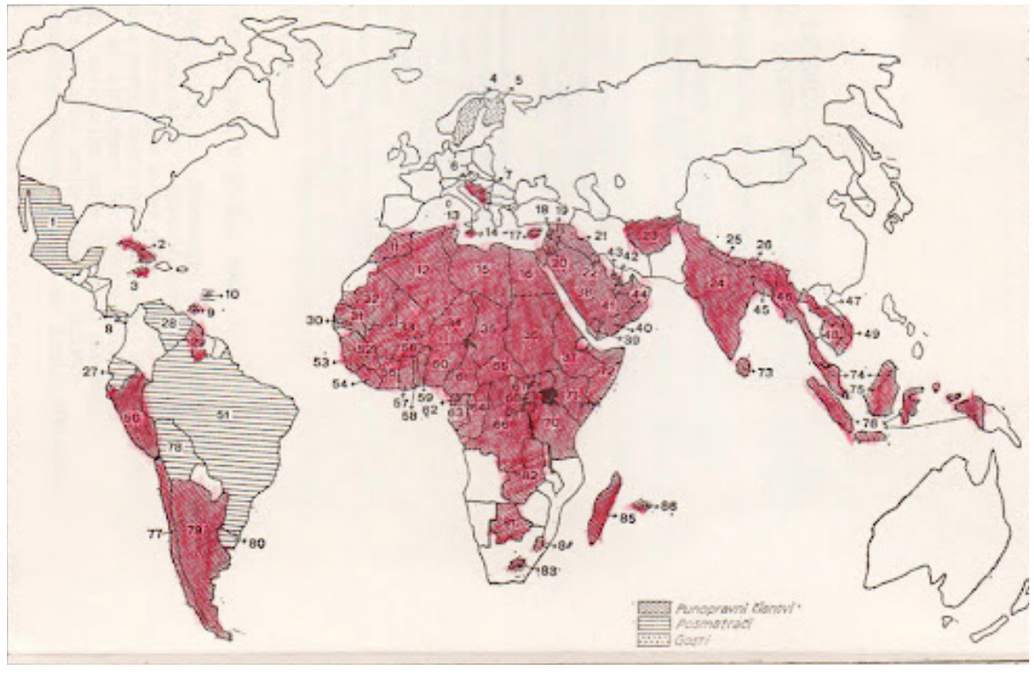
In Croatia, the genesis of coastal tourism can be traced back to the late 19th century, with Opatija serving as a pioneering destination. Opatija, initially a small fishing village, transformed into a fashionable resort for the Austro-Hungarian elite. Its mild climate, scenic beauty, and therapeutic sea air made it a preferred destination for health and relaxation. The construction of the Southern Railway, connecting Vienna and Trieste, further facilitated access to Opatija, accelerating its popularity (Perišić, 2017). The development of coastal tourism in Croatia, and particularly in Opatija, mirrored broader European trends, where seaside resorts became symbols of social status and leisure. These destinations offered a blend of natural beauty, therapeutic benefits, and opportunities for socializing, setting the stage for modern coastal tourism.

Gradually, as travel became more accessible to the wider population, these coastal areas evolved from exclusive enclaves to destinations catering to a more diverse clientele. Opatija's transformation from a fishing village to a renowned seaside resort exemplifies the broader transition of coastal areas into major tourist destinations. This evolution reflects the changing perceptions and values associated with leisure, health, and the natural environment. Today, coastal tourism is a vital component of the global tourism industry, with its origins in these early developments.



Early tourism in Makarska, 1937

Countermelody



The Non-Aligned Movement, 1961

Yugoslavian Tourism

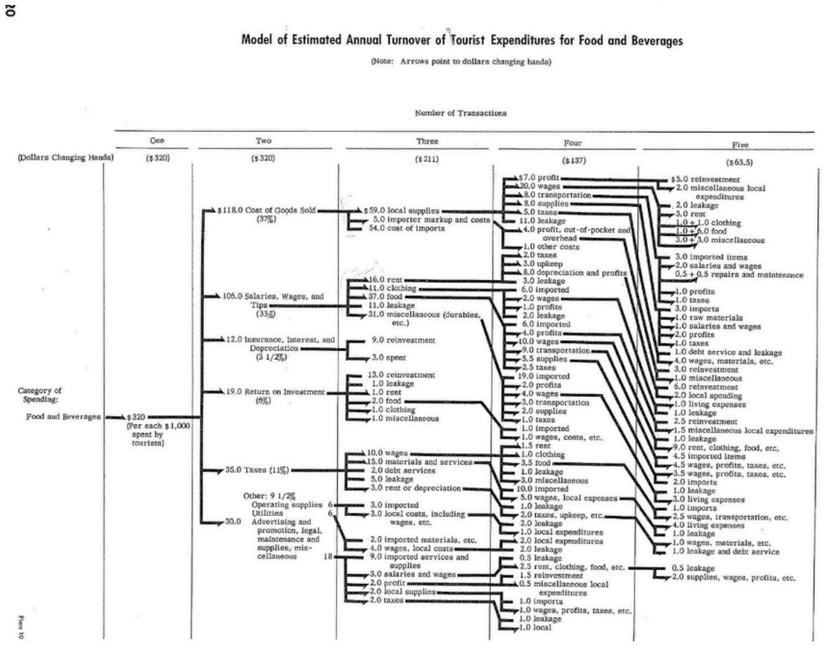
In the 1950s and 1960s, Yugoslavia occupied a unique position in the global landscape, particularly in the context of the burgeoning tourism industry. As a socialist country not aligned with either the Western capitalist bloc or the Soviet Eastern bloc, Yugoslavia was a key player in the Non-Aligned Movement. This unique geopolitical stance allowed Yugoslavia to establish diverse diplomatic relations, fostering a distinctive international identity (Patterson, 2011).

Yugoslavia's leadership under Josip Broz Tito recognized the potential of tourism as a tool for economic development and international diplomacy. The decision to shift towards tourism was driven by several factors. Primarily, it was seen as a means to generate foreign exchange earnings and stimulate the economy without relying on either of the superpowers. Additionally, tourism was viewed as a way to showcase Yugoslavia's unique brand of socialism to the world, presenting a more open and progressive face compared to other socialist countries (Hall, 2002).

The development of the tourism sector in Yugoslavia was marked by a significant investment in infrastructure, including hotels, resorts, and transportation networks. The Adriatic coast, with its picturesque beaches and historic towns, became a focal point for these developments. This period saw the rise of destinations such as Dubrovnik and the Istrian peninsula, which attracted visitors from both Western Europe and the Eastern bloc, capitalizing on Yugoslavia's strategic location and non-aligned status (Bakić, 2008).

The tourism strategy in Yugoslavia during this era was not just about economic gain; it was also about cultural exchange and international engagement. By welcoming tourists from diverse nations, Yugoslavia aimed to build bridges between East and West during the Cold War, promoting understanding and cooperation through people-to-people contacts (Luthar, 2016).

Yugoslavia's approach to tourism in the mid-20th century was thus a reflection of its broader political and diplomatic strategies. The country leveraged its unique position in the world to develop a thriving tourism industry that contributed to its economic growth and international standing.

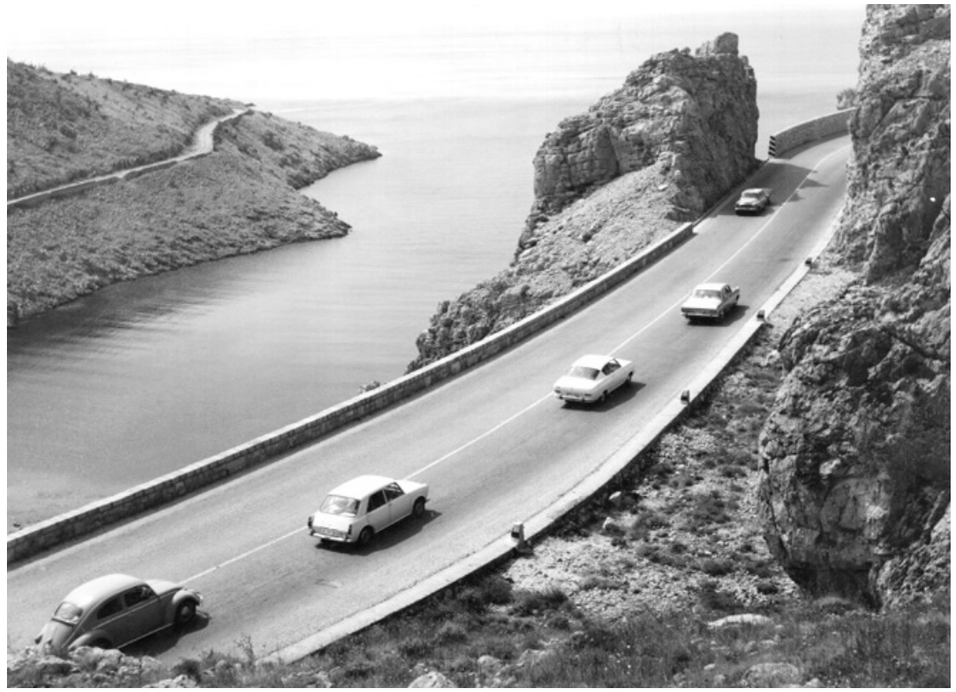


The Multiplier Effect, The Cecchi Report, 1961

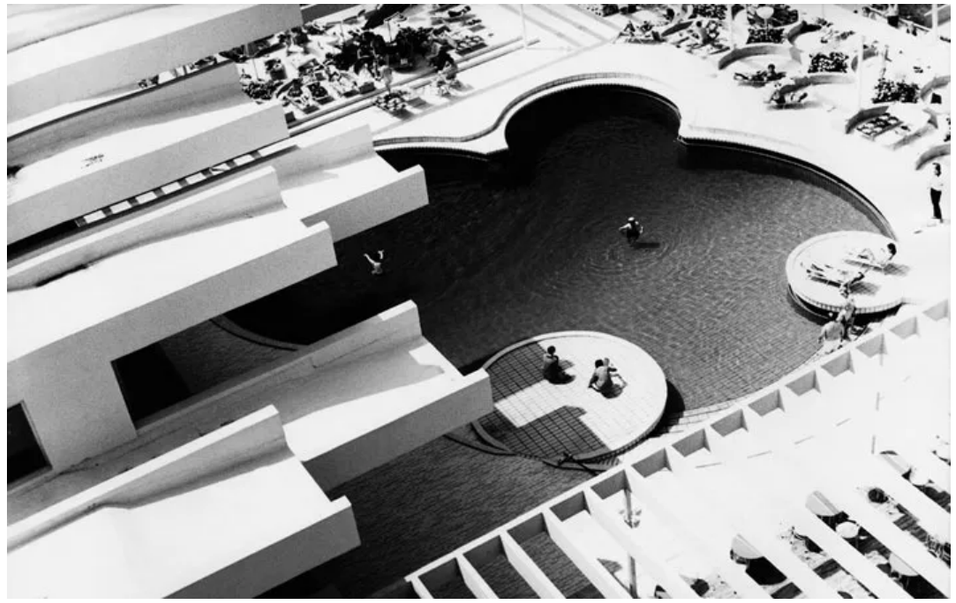
Mass Tourism as a Development Strategy

In the post-World War II era, particularly the 1950s and 1960s, Yugoslavia's strategic embrace of tourism was influenced by global economic trends and the nation's unique geopolitical position. Recognizing the potential multiplier effect of tourism, as outlined in the Cecchi Report and supported by international bodies like the World Bank and the United Nations, Yugoslavia sought to leverage tourism as a key driver of economic development and international diplomacy. The Cecchi Report, a seminal document in the history of tourism development, emphasized the sector's potential to generate economic growth through its multiplier effect – the capacity of tourism to spur additional economic activity beyond the direct expenditure by tourists (Cecchi, 1952). This concept became a guiding principle for Yugoslavia's tourism strategy, aligning with the World Bank and UN's recommendations to utilize tourism as a tool for socio-economic development.

The Adriatic Highway was a notable infrastructure project financed by the UN, enhancing the region's accessibility and kick-starting spatial development. Yugoslavia's approach to tourism was broad, encompassing sustainable development and the integration of tourism within the larger socio-economic framework. The role of the World Bank and the UN in this strategic shift was significant, offering both financial and technical assistance. Their involvement underscored the importance of adopting sustainable practices in tourism development, ensuring that economic growth did not come at the expense of environmental degradation or cultural dilution.
Yugoslavia's tourism development strategy, thus, was not just an economic initiative; it was a holistic approach that considered the social, cultural, and environmental impacts of tourism. This approach mirrored a global shift in understanding tourism's role, moving beyond economic gains to encompass broader developmental goals.



The Adriatic Highway, 1965



Palace Hotel Haludovo, Boris Magaš, 1971

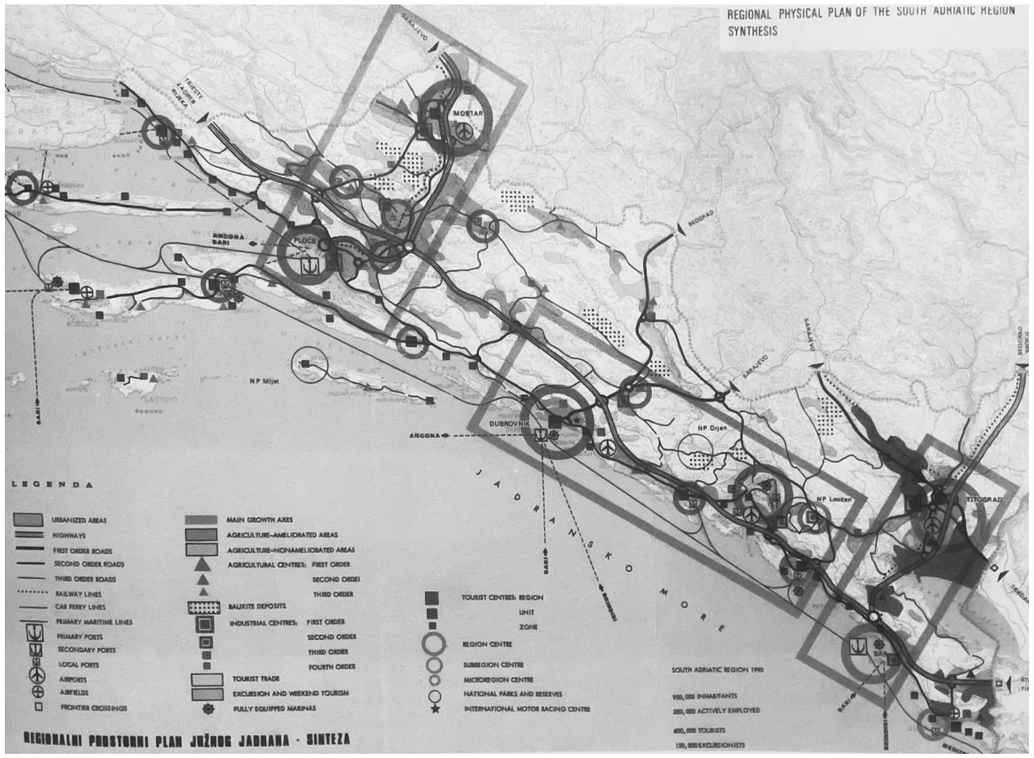
Mass Tourism as a Development Strategy

The development of the Adriatic Highway and key projects like the Haludovo Hotel Complex played crucial roles in advancing Yugoslavia's tourism sector, significantly impacting its economic and social fabric. The Adriatic Highway, completed in 1965, was a monumental initiative that connected diverse regions along the coast, facilitating accessibility and spurring economic growth across these areas. This infrastructure not only boosted tourism but also stimulated local economies by creating numerous jobs and enhancing service-oriented roles (Čavlović, 2020).

The Haludovo Hotel Complex, financed by foreign investment, became a symbol of Yugoslavia's openness to the global community, drawing visitors from both sides of the Iron Curtain. Its development reflected Yugoslavia's strategic use of tourism to foster economic development and international diplomacy. These initiatives were aligned with socialist values, promoting 'workers' rest' by providing affordable vacation options for domestic workers, thus supporting the welfare of the working class (Grandits & Taylor, 2013).

Furthermore, these projects contributed to the modernization of Yugoslavia's coastal regions, integrating them more closely into the broader European context. The infrastructure developed through these efforts, such as roads and communication systems, improved the quality of life for residents and helped decentralize industrial growth, leading to more balanced regional development. The increase in tourism also led to the construction of modern amenities, hotels, and recreational facilities, further enhancing the appeal of the coastal areas.

The positive cultural and economic impacts of these tourism developments were significant. They introduced new dynamics into the local economies, enriched cultural exchanges, and demonstrated the potential of tourism to act as a catalyst for economic transformation and social improvement. The integration of foreign investment and the strategic planning of tourist infrastructure showcased Yugoslavia's innovative approach to leveraging its natural and cultural assets for sustainable growth.
Overall, the efforts to develop tourism infrastructure highlight Yugoslavia's successful strategy in leveraging tourism for economic growth, social welfare, and international engagement.



South Adriatic Regional Plan - synthesis, 1971

Attempts at a Planned Tourism

During the period from 1960 to 1990, planning efforts for the Croatian Adriatic Coast were characterized by a unique blend of ambitious development and cautious preservation. These efforts were driven by the recognition of the coast's immense potential as a tourist destination and the need to balance this with sustainable environmental practices.

In the 1960s, the Yugoslav government, recognizing the tourism sector's potential for economic development, embarked on a series of comprehensive planning initiatives. One of the key documents was the "Program of Long-term Development and Spatial Organization of the Adriatic Region" (1967), produced by a multi-disciplinary team from the Urban Planning Institute of Croatia. This program aimed to harmonize various interests along the coast, particularly in light of the burgeoning construction activity post the completion of the Adriatic Highway (Urban Planning Institute of Croatia, 1967). The program considered the cyclicality of international crises and the seasonality of coastal tourism, suggesting that agriculture and industry should complement tourism as economic bases.

The 1980s saw further refinement of these planning efforts, with a greater focus on environmental sustainability. This shift was partly due to increased international collaboration, especially with organizations like the United Nations, which emphasized the importance of preserving the coast's natural and cultural heritage. Consequently, new plans incorporated more stringent guidelines for urban development and environmental protection (United Nations Development Programme, 1985). These planning efforts for the Croatian Adriatic Coast during 1960-1990 laid the groundwork for the region's current status as a prime tourist destination, emphasizing a balance between development and sustainability.

Palace Hotel Haludovo, Boris Magaš, 1971, photographed in 2023

Holidays After the Fall

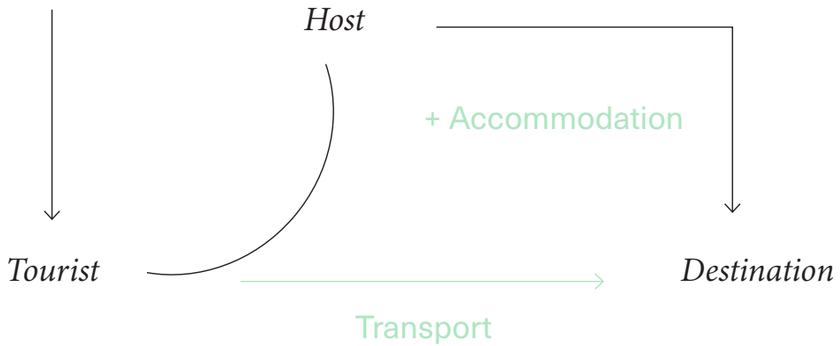
After the fall of Yugoslavia in the early 1990s, Croatia's tourism idustry faced severe challenges. The regional conflicts and the shift from a socialist to a market economy disrupted the sector, leading to infrastructure damage and the decline of once-thriving tourist destinations. The deterioration of the Haludovo Palace Hotel on the island of Krk serves as a poignant example of this broader decay. Originally a luxurious resort attracting affluent international visitors, Haludovo suffered from the chaotic privatization processes that marked Croatia's transition. Misguided privatization schemes led to complex ownership disputes and neglect, resulting in its rapid deterioration, reflecting the fate of many tourist facilities in the region (Beyer, Hagemann, & Zinganel, 2013).

The issues at Haludovo illustrate the wider challenges in Croatian tourism, where the focus on rapid privatization often overlooked the need for sustainable management and investment. This approach resulted in increased property prices and living costs, impacting local residents' access to housing and exacerbating conflicts over land use, including illegal attempts at shoreline privatization. Moreover, the emphasis on attracting foreign investment often prioritized short-term tourist numbers over the long-term well-being of local communities, leading to environmental degradation and a socio-economic landscape heavily tilted towards serving international tourists at the expense of local needs (Hall, 2019).

These developments underline the complex legacy of Croatia's post-socialist transition in the tourism sector, highlighting the need for strategies that balance economic growth with community welfare and environmental preservation.

Touristic Spatial Elements

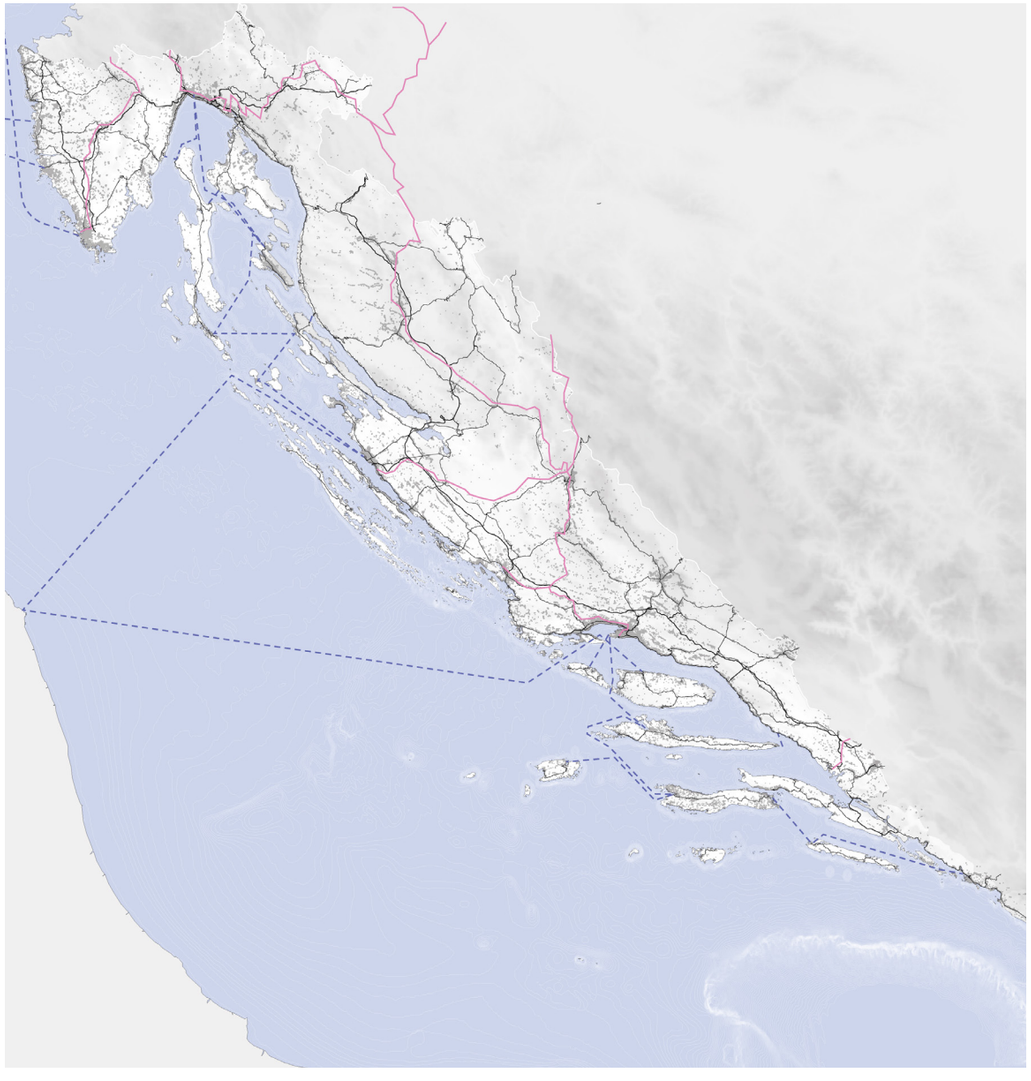
Human Space = Attraction



Examining tourism as a spatial layer is inherently complex. Despite our awareness of the diverse structures and consequences of spatial interventions driven by tourism, there is often a lack of clear definition in the analysis and planning of touristic spatial elements. However, an in-depth analysis of the ontology and chronology of tourism along the Croatian coast reveals a consistent pattern: three critical elements always emerge—attractions, transportation infrastructure, and accommodation. These pivotal components drive the spatial transformations induced by tourism, shaping both landscapes and local communities.

Attractions, transportation infrastructure, and accommodation are pivotal elements in the spatial transformations driven by tourism, shaping both landscapes and local communities. Attractions, be they natural landmarks, cultural sites, or entertainment venues, are the primary motivators for tourist travel. They define the destinations and often dictate the patterns of tourist flow and development. The geographical distribution and appeal of these attractions significantly influence where and how tourism develops, often leading to concentrated development in specific areas (Lew, 2017).
Transportation infrastructure is integral to tourism, facilitating access of tourists to attractions. The development of roads, airports, and railways directly correlates with the accessibility and popularity of a tourist destination. Efficient and extensive transportation networks can dramatically increase the number of visitors to a region, contributing to its economic growth. However, this infrastructure can also lead to environmental degradation if not planned sustainably. Accommodation is a critical component, providing tourists with places to stay during their visits. The type and scale of accommodations, ranging from luxury resorts to budget hostels, shape the character and capacity of a destination. Accommodation development must balance meeting tourist demands with preserving the local environment and community interests. Overdevelopment in accommodations can lead to issues like overcrowding and resource depletion, while underdevelopment may limit a destination's tourism potential (Dwyer, 2018).

Together, these three elements – attractions, transportation, and accommodation – form a triad that defines the spatial dynamics of tourism. Only once all three are present can we talk about a tourist destination.

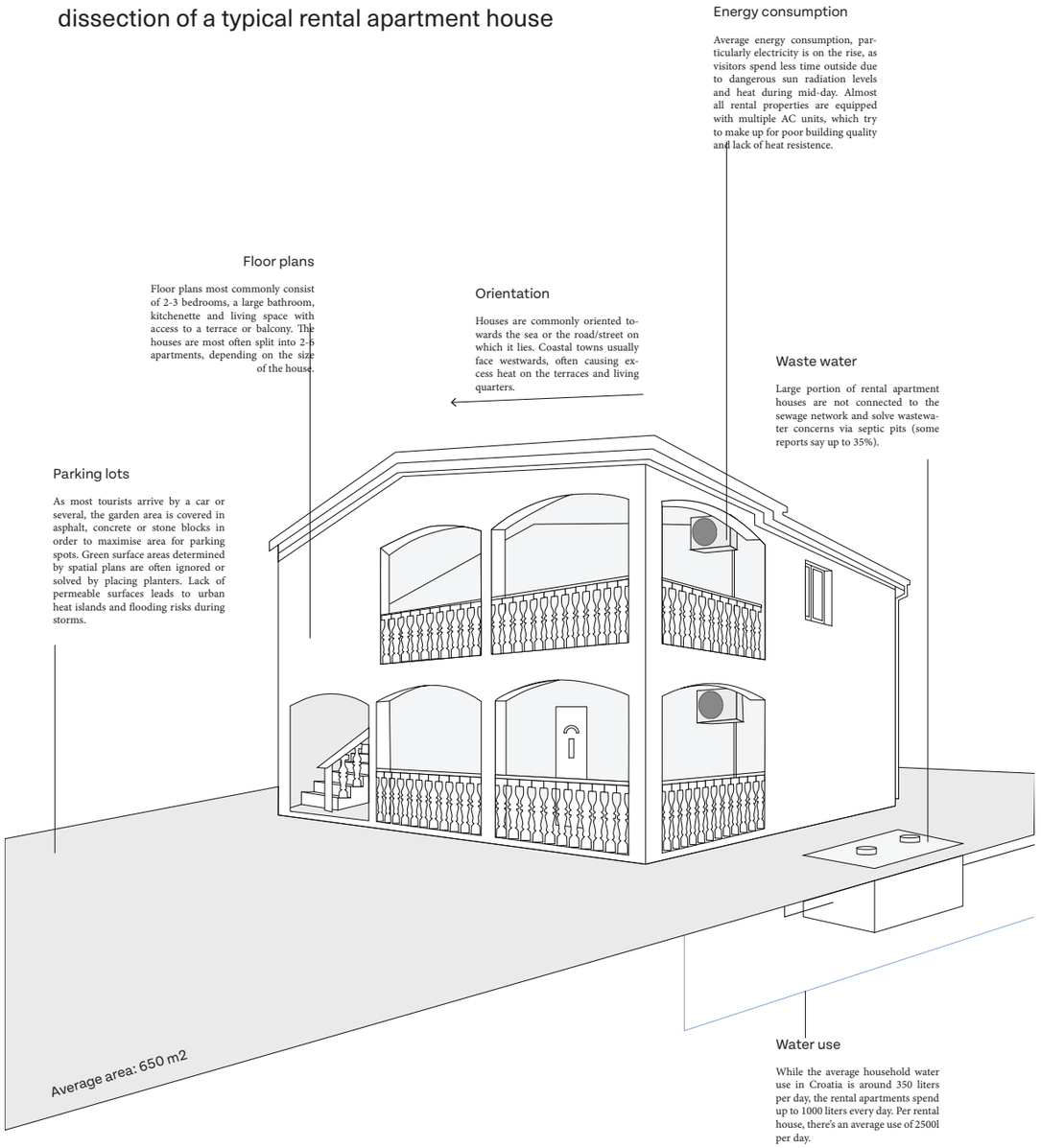


Transportation

Transportation infrastructure plays a crucial role in shaping the spatial dynamics of tourism, particularly in Croatia, where the evolution of road networks has been central to its development as a tourist destination. Initially conceptualized during Yugoslavia, the idea of Croatia as a ‘car destination’ significantly influenced its transportation planning and infrastructure development. This approach led to an extensive network of roads and highways, facilitating easier access to various tourist attractions across the country (Croatian National Tourist Board, 2021). The construction of major highways, such as the Adriatic Highway in the 1960s and later the A1 motorway connecting Zagreb and Split, transformed the accessibility of the Croatian coast and hinterlands, reducing travel times and making remote areas more reachable for domestic and international tourists traveling by car. This development of road infrastructure not only enhanced the appeal of Croatia as a car-friendly destination but also stimulated local economies along these routes (Marasović et al., 2019).

However, the focus on road infrastructure had implications for other forms of transport. While the road network expanded, railway and maritime connections received comparatively less attention, leading to a dominance of road travel over other transportation modes. Despite this, Croatia’s coastal geography and the significance of its islands have necessitated the development of maritime transport infrastructure, including ferry services connecting the mainland with various islands. These services are crucial for both tourism and local connectivity (Pleterski, 2018).
Air travel infrastructure has also seen development, with airports in cities like Dubrovnik, Split, and Zagreb undergoing expansions to handle increasing tourist inflows. This has further diversified the transportation infrastructure, catering to different tourist preferences and needs (Ivanović, 2020).

dissection of a typical rental apartment house



Accommodation

Accommodation in Croatia been having a significant rise of private rental accommodations alongside traditional hotels, resorts, and camping sites. The private rental accommodation phenomena has been characteristic for the Croatian context for some time, but the advent of online platforms like Airbnb has further intensified an already problematic accommodation landscape, allowing homeowners to offer private rentals without much regulation (Pleterski, 2018).

Hotels and resort complexes, however, continue to play a vital role, particularly in catering to tourists who prefer all-inclusive packages and standardized services. These establishments are often concentrated in prime tourist locations and offer a range of amenities and services (Marasović et al., 2019). Camping sites, appealing to a different segment of the market, offer more budget-friendly and nature-oriented accommodation options and are less intense in how they put pressure on the area.

1. Rental Apartment Houses

53% of visits

2. Hotels

31,2% of visits

3. Holiday Resorts

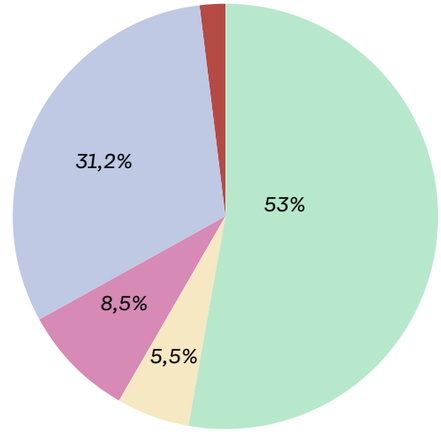
5,5% of visits

4. Camps

8,5% of visits

*other

1,8% of visits



structure of overnight stays by tourists by type of accomodation (2019)

natural beach

promenade beach

“town beach”

pier

Attraction

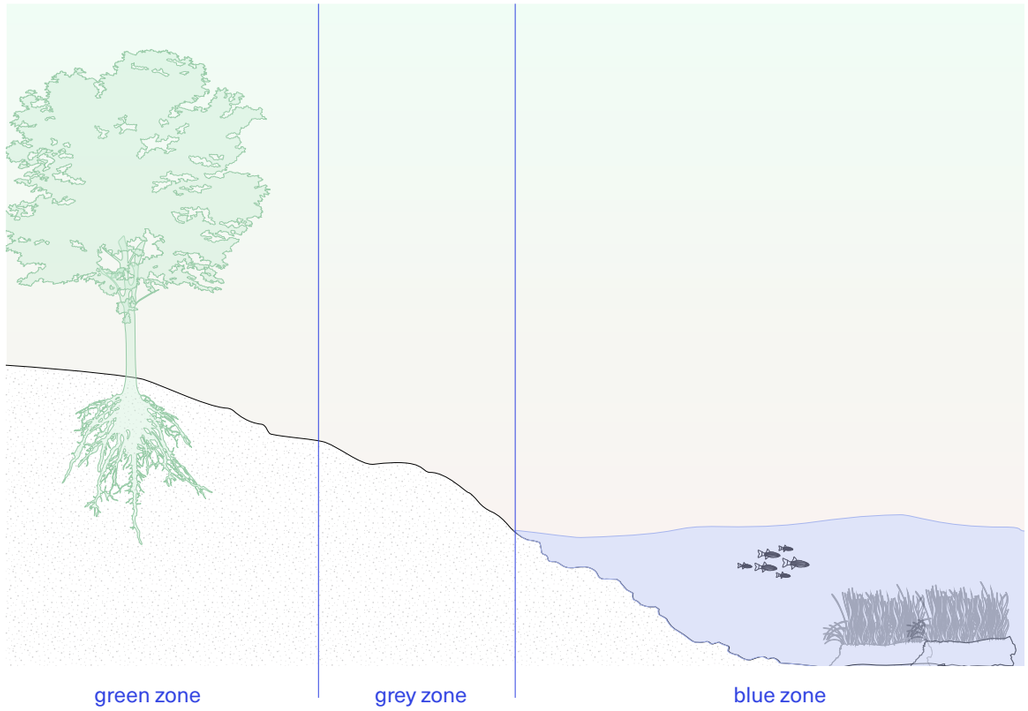
In the context of spatial transformations in tourism, attractions play a pivotal role, acting as the primary draw for visitors and significantly influencing the development and character of a destination. In Croatia, attractions can be categorized into four primary types: beaches, historical heritage, ‘other nature,’ and spectacles, each contributing uniquely to the country’s tourism landscape.

Beaches are arguably the most prominent tourist attractions in Croatia, renowned for their pristine beauty and crystal-clear waters. Destinations like the Dalmatian Coast have become synonymous with idyllic beach tourism, driving significant development in terms of accommodation and infrastructure to cater to beachgoers (Croatian National Tourist Board, 2021). This development often reshapes coastal areas, both physically and economically, modifying the coastal edge to fit the different functions and types of use, to the point they no longer resemble their initial state (image on left).

Historical heritage is another major draw, with most coastal cit ies offering rich historical narratives through well-preserved architectural marvels. This category extends beyond mere buildings to encompass the cultural practices and traditions that imbue these spaces with meaning. The preservation and presentation of historical sites often necessitate careful urban planning to balance tourist influx with heritage conservation (Pleterski, 2018).

The ‘other nature’ category includes attractions like the Plitvice Lakes and the mountainous regions, offering diverse experiences away from the coast. These areas, while not as prominently featured as beaches, provide alternative tourism experiences and are crucial for dispersing tourist activities across the country, thus mitigating the effects of over-tourism in coastal areas.

Spectacles, such as events or film-related tourism and events such as festivals, add a contemporary dimension. These attractions often generate short-term surges in visitor numbers (Ivanovic, 2020).
Collectively, these attraction categories drive spatial transformations in the tourism sector, influencing where and how development occurs. However, this thesis will focus on beaches as the primary attractor of the Croatian coast.



Attraction Beach

A beach is a dynamic coastal landform comprising loose particles like sand, gravel, pebbles, cobblestones, or biological detritus such as shell fragments and coralline algae. The formation and continuous reshaping of beaches result from the interplay of waves, tides, and currents (Masselink, 2011). Defining the coastal edge involves recognizing the geographical extent influenced by tidal fluctuations, the ecological transition between marine and terrestrial environments, and geomorphological features like dunes, cliffs, and estuaries. These aspects underscore the complexity and variability inherent to coastal environments.

A natural beach typically comprises three distinct zones: the green zone, the grey zone, and the blue zone. The green zone includes vegetation and trees at the landward edge of the beach, which play a critical role in stabilizing the shoreline, providing habitats for wildlife. Coastal vegetation, helps prevent erosion, cools the area during heatwaves and protects the inland from storm surges.

The grey zone, or the intermediate zone, is characterized by rocks, pebbles, or sand that have been eroded and shaped by salt, sun, water, and waves. This area is the most dynamic part of the beach, where materials are continuously deposited and eroded, creating di- verse substrates that support various organisms

The blue zone extends from the shoreline into the ocean and includes the intertidal area, which is submerged during high tide and exposed during low tide. Influenced by wave action, currents, and tides, the blue zone supports marine life adapted to these fluctuating conditions. Together, these zones form an interconnected system that sustains diverse ecological communities and provides natural protection against coastal erosion. (Masselink, 2011)

City

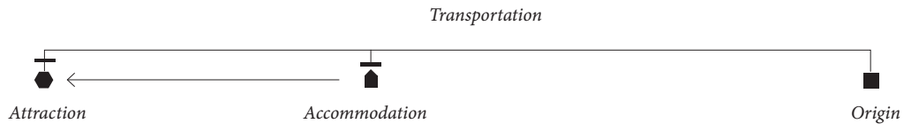
Riviera

Island with dry connection

Island without dry connection

Element Configurations

The interplay between the three primary elements of tourism — transportation, accommodation, and attractions — shapes the touristic landscape. Transportation connects the traveler's origin to the destination, with accommodations typically situated along transportation routes, ideally close to the attractions. Attractions serve as the focal point, around which transportation and accommodation are organized. This interconnected relationship can be observed across various scales and configurations.



Typical configurations include cities, coastal rivieras, and islands (image on left). Cities often contain embedded attractions. For example, Split and Dubrovnik are cities where the attractions are integral parts of the urban environment, contrasting with cities where the beach is the primary attraction. Coastal rivieras are collections of interconnected towns along the coast, where the development is driven by transportation infrastructure. Islands present a unique scenario, where connectivity varies; some islands are connected to the mainland by bridges, while others rely solely on sea access.

The impact of tourism varies among these different types of settlements, largely depending on the number of permanent functions, the proximity to attractions, and transportation accessibility. Cities with numerous permanent functions can better absorb the influx of tourists, maintaining a balance between local life and tourism. On the other hand, areas with fewer permanent functions, high proximity to attractions, and easy transportation access often experience significant changes driven by tourism.

II.3 Dissonance

a combination of notes that sound harsh or unstable together, often creating a sense of tension that seeks resolution (Griffiths, 2005).

Dissonance

This chapter delves into the accelerated risks and limits imposed on the socio-ecological layer of the Croatian coast by tourism's spatial transformations. It explores the escalating tensions and risks that have emerged from this rapid development, particularly in terms of environmental sustainability and socio-cultural preservation. The aim is to provide a comprehensive view of the diminution effect in the context of tourism, where the speed of change and development outpaces the capacity of natural and societal systems to adapt, leading to heightened risks and approaching limits. This chapter is crucial for recognizing the urgency of reevaluating and reorienting tourism development towards more sustainable and equitable practices.

Simultaneity

Systems in Dissonance

The current state of Croatia's tourism, encompassing attractions, transportation, and accommodation, reflects both its successes and challenges in managing sustainable growth. The term "betonizacija" aptly captures the overconstruction of the coastline, a consequence of unregulated development in response to the tourism boom. This phenomenon has led to a visual and environmental impact on the coastline, raising concerns about the long-term sustainability of such development practices (Begić & Mimica, 2005). In terms of transportation, Croatia's strategy as an "auto-destinacija" or car destination continues to influence its tourism landscape. The extensive road network, notably the Adriatic Highway, facilitates easy access to various tourist hotspots. However, this car-centric approach has implications for traffic congestion and environmental impact, particularly during peak tourist seasons (Marušić & Krešić, 2009).

The accommodation sector is marked by "apartmanizacija," the trend of private rental apartments, which has seen a significant rise. This trend, initially incentivized during Yugoslavia, continues to shape the accommodation landscape in Croatia. While it offers tourists diverse lodging options, it has also led to unplanned and sometimes illegal construction activities, particularly along the coast, contributing to the betonizacija phenomenon (Klarin, 2018). These spatial elements, while supporting the growth of Croatia's tourism industry, highlight the need for more integrated and sustainable planning approaches to balance economic benefits with environmental and social considerations.

Regulation and Planning Failures

The spatial planning system in Croatia has a profound impact on its tourism sector, especially regarding coastal development. The policy landscape during the late 20th and early 21st centuries significantly influenced the proliferation of rental apartment houses and secondary homes, leading to overbuilding in coastal areas. This phenomenon is driven by various factors, including incentives during Yugoslavia, tax policies, and land-use regulations.

During the Yugoslav era, the government encouraged the development of private accommodations to supplement hotel capacities, inadvertently setting the stage for the secondary home building wave. This policy aimed to boost tourism by increasing the availability of accommodations, providing incentives for private individuals to invest in rental properties. Although successful in expanding tourist accommodations, this initiative also laid the groundwork for unregulated construction, often at the expense of environmental and urban planning considerations (Begić & Mimica, 2005).

Following independence, the Croatian government's approach to taxation played a significant role in the continued trend of overbuilding. Low taxes on rental income made investing in apartment houses financially attractive for homeowners. This tax policy, coupled with growing demand for tourist accommodations, fueled the construction of secondary homes, often without adequate urban planning oversight (Marušić & Krešić, 2009). The lack of stringent regulations and enforcement mechanisms further exacerbated the issue, leading to a boom in construction that frequently disregarded sustainable development principles.

Land-use policies, particularly in the context of forest fires, have also had unintended consequences on coastal development. In some cases, fires led to changes in land use, with burned forest areas being converted into construction sites. This practice, driven by policy gaps and enforcement issues, contributed to the overbuilding phenomenon, altering the natural landscape and raising concerns about sustainable development (Klarin, 2018).

The current spatial planning system has been widely criticized for making spatial degradation possible, and sometimes even unintentionally incentivizing it. The environmental impacts are significant, with coastal areas, prime tourist destinations, experiencing substantial ecological degradation. The unregulated construction boom has led to the destruction of natural habitats that took millennia to form, harming biodiversity and undermining the ecological balance essential for the long-term health of these environments.

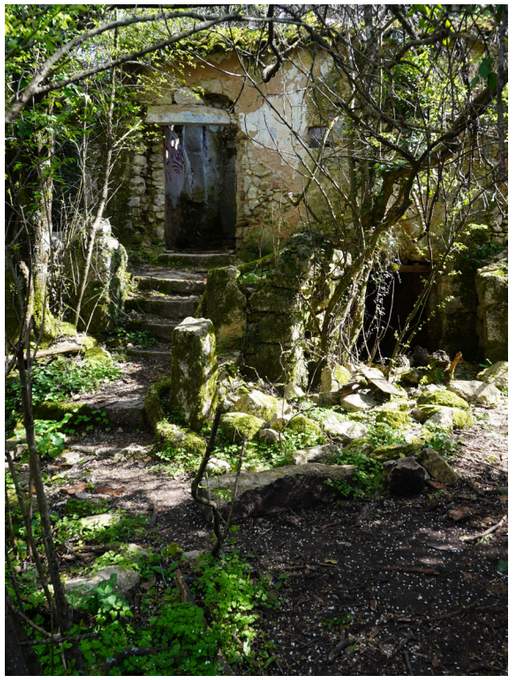
The socio-economic impacts are equally profound. Overbuilding in coastal areas has disrupted local communities, altering socio-economic fabrics that have sustained livelihoods for generations. The proliferation of rental properties and secondary homes often comes at the expense of local residents, who face increased living costs and decreased availability of affordable housing. This dynamic has led to a loss of community cohesion and undermined the socio-economic stability of these regions. The identity of many coastal towns and villages has been transformed, with vibrant, community-oriented locales increasingly dominated by transient tourist populations and speculative real estate investments. This shift diminishes the cultural heritage and local character integral to the identity of these places.

Criticism of Croatia's spatial planning system highlights the lack of comprehensive and enforceable regulations balancing development with environmental and social sustainability. The current planning framework is often fragmented and reactive, lacking cohesive strategies needed to manage growth effectively and equitably (Analiza prostornih planova županija, 2014). Insufficient coordination between different levels of government and stakeholders further exacerbates the issue, leading to inconsistent implementation of policies and plans. The emphasis on short-term economic gains often overshadows long-term planning considerations, resulting in piecemeal and unsustainable development practices.

To address these issues, there is a need for more integrated and sustainable planning approaches prioritizing long-term environmental health and community well-being over short-term economic gains.

Uncertainty

Dolova Village (abandoned in 1971)



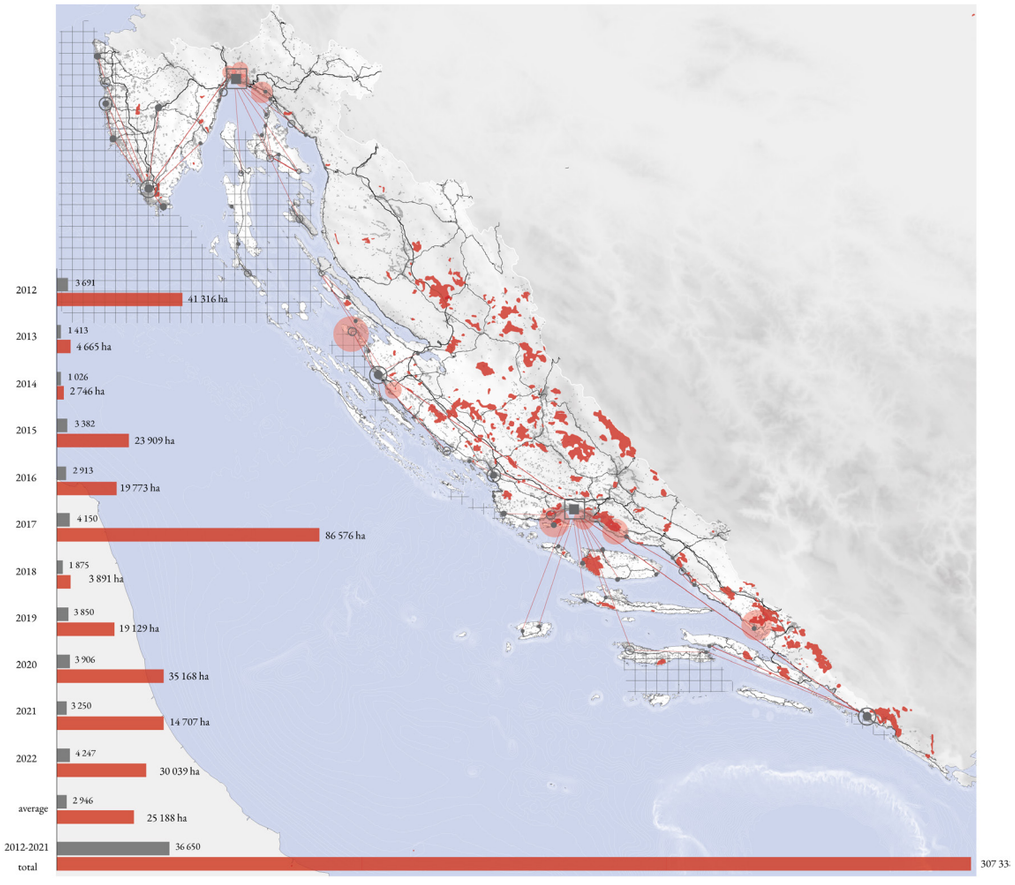
Haludovo Hotel Complex (abandoned in 2000)

Certainty of Uncertainty

Allowing high-impact projects in socially and environmentally sensitive areas for short-term economic gains benefits private investors at the expense of broader, more sustainable interests. This approach overlooks the evident consequences that surround us: economies are highly dynamic, with many structures facing abandonment or demolition within just 10 to 30 years of use. The price for this short-termism is the destruction of habitats that have taken millennia to form and the disruption of socio-economic fabrics that sustain local livelihoods and shape the identity of places.

Nature and communities perform unpaid work, maintaining ecological balance and cultural heritage without direct compensation (Moore, 2014). Ignoring this essential, unpaid labor undermines long-term environmental health and socio-economic stability, leading to irreversible damage to ecosystems and communities. This approach fails to recognize the intrinsic value of sustainable development, prioritizing immediate financial returns over enduring ecological and social well-being. As a result, future generations inherit degraded environments and weakened social structures, highlighting the urgent need to rethink development strategies in sensitive areas.

Economies are highly dynamic, and many high-impact structures are often abandoned or demolished after a few decades of use. The destruction of habitats and the erosion of socio-economic fabrics come at a high cost, disrupting local livelihoods and cultural identities. This certainty of uncertainty demands a reevaluation of how we approach development in sensitive areas, advocating for policies that respect and preserve the invaluable contributions of nature and local communities. By prioritizing sustainable practices, we can ensure that development benefits both the environment and the socio-economic stability of local populations.



Deteriorated areas vulnerable to climate change:

Areas burnt by forest fires

Areas dedicated to trawling

Overconstructed areas

Approaching the point of no return

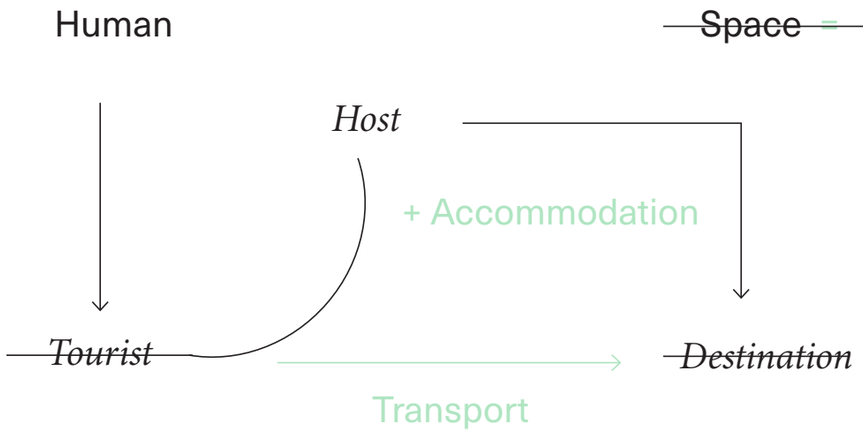
An obvious example of predictable uncertainty is the climate crisis, which exacerbates the already significant environmental and socio-economic pressures discussed earlier. The loss of crucial ecosystems, such as the maquis shrublands and pine forests, is a direct consequence of these pressures. Alarmingly, about 13% of these coastal habitats have been lost to wildfires over the past decade, a result of both climate change and human activities (Croatian Ministry of Environment and Energy, 2021). These environmental changes, compounded by policy gaps and inadequate planning, illustrate the destructive impact of prioritizing short-term economic gains over long-term sustainability.

Marine ecosystems, particularly Posidonia oceanica meadows, are also under severe threat. These underwater meadows, vital for maintaining water quality and marine biodiversity, are increasingly damaged by trawling, anchoring, and other nautical activities. The degradation of these meadows disrupts sedimentation cycles and affects the health of coastal and shallow water ecosystems (Bennett, 2012). This aligns with the earlier discussed certainty of uncertainty, where the environmental costs of development are often overlooked until they reach a critical point.

The physical alteration of the coastline through overconstruction and unplanned beach nourishment projects exacerbates these environmental issues. The trend of ‘betonizacija,’ or the overbuilding of coastal areas with concrete structures, coupled with haphazard beach nourishment, interrupts natural sedimentation processes, further destabilizing coastal ecosystems (Marušić & Krešić, 2009). These developments are direct outcomes of the policy challenges and the disregard for sustainable planning highlighted earlier.

Moreover, the ‘apartmanizacija’ trend, characterized by the proliferation of rental apartments and secondary homes, adds additional pressure on local infrastructures and communities. This overbuilding of accommodation facilities strains natural resources and diminishes the overall quality of life for residents and visitors alike (Begić & Mimica, 2005). This situation epitomizes the socio-economic consequences discussed in the certainty of uncertainty, where short-term financial gains are overshadowed by long-term community and environmental costs.

The Paradox of Attraction



The ‘Paradox of Attraction’ in tourism is a stark illustration of the delicate balance between preservation and exploitation. These attractions are often the primary draw for tourists, fueling the local economy and cultural exchange. Yet, ironically, the influx of visitors and the infrastructure developed to accommodate them can threaten the very essence of the areas which attracted them in the first place. This initial attractive feature is a byproduct of processes of more-than-human habitats, but also spaces where people have lived and thus reshaped them, either through cultural identity or by operationalising them for different resources.
Overcrowding, pollution, and habitat destruction can degrade these processes and the resulting space, making the transformation of it into a destination no longer possible.

This paradox highlights the critical need for responsible spatial transformations that protect and care for natural attractions without compromising their integrity.


JCB

III. PERMUTATION

altering the order of a set of musical elements, such as notes in a row, rhythms, or chords (Kennedy, 2006)

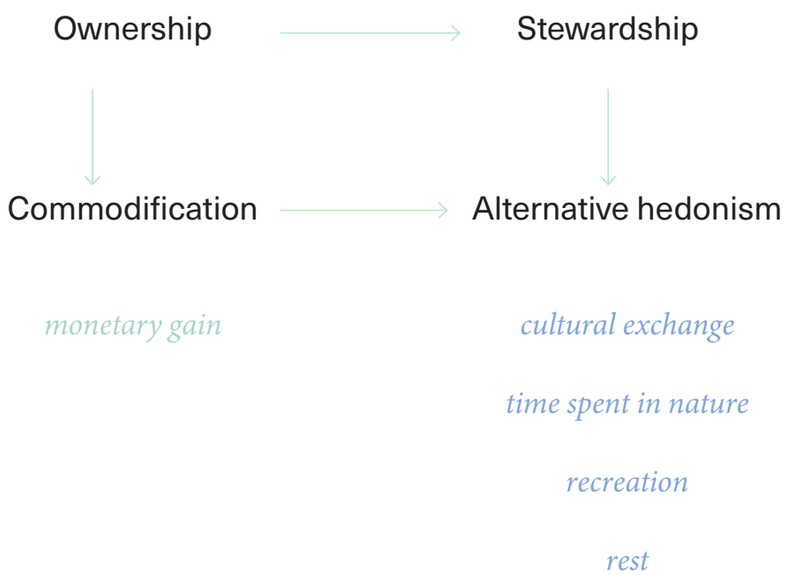
III.1 Inversion

flipping a melody or chord upside down, so the notes that were high become low and vice versa (Griffiths, 2005).

Inversion

To initiate a permutation in the current approach we must first define what and how we are shifting. The previous chapter revealed to us the different systems which constitute simultaneity and dissonance, however it did not fully answer the question how and why do these dissonances occur. A new analytical and projective method is explored by following threads of different perspectives.

Shift



PERMUTATION

Values

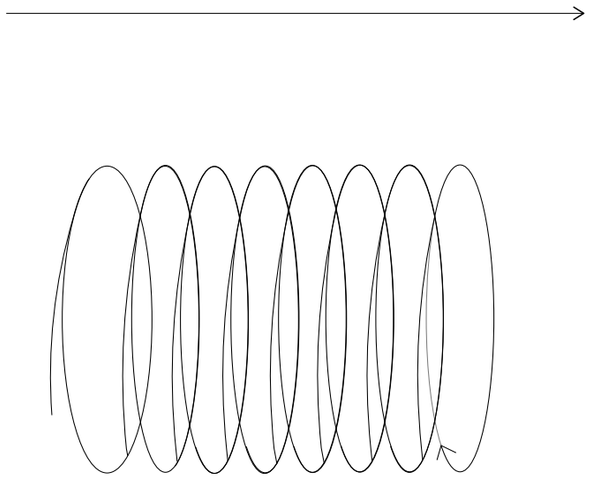
Resolving the ‘Paradox of Attraction’ in tourism necessitates a fundamental reassessment of our value systems. As tourist numbers burgeon and the impact of climate change escalates, it becomes crucial to transition from short-term ideas of land ownership to place stewardship, and from the commodification of the coast to a deeper engagement with its complex identity. The paradox of attraction highlights how the very elements that draw visitors—the pristine beaches, historic sites, and unique cultural experiences—are endangered by the influx and activities of those tourists. This phenomenon underscores the urgent need for sustainable practices that protect and enhance these attractions rather than exploit them.

Central to this reassessment is adopting a post-growth perspective, advocating a shift from relentless economic expansion towards sustainable practices prioritising ecological and social well-being (Escobar, 2018; Saito, 2017). Reflecting on the ancient concept of otium—leisure dedicated to rest, recreation and cultural enrichment—enriches our understanding of tourism’s potential benefits beyond financial gains. It promotes a symbiotic relationship between self-care and care for the destination.

As we delve deeper into re-examining our values, it becomes evident that the temporal and spatial dimensions in which these values operate must also be reconsidered. This leads us to question the traditional perceptions of time and space within the context of tourism and coastal management.

Inversion

Perception of Time and Space

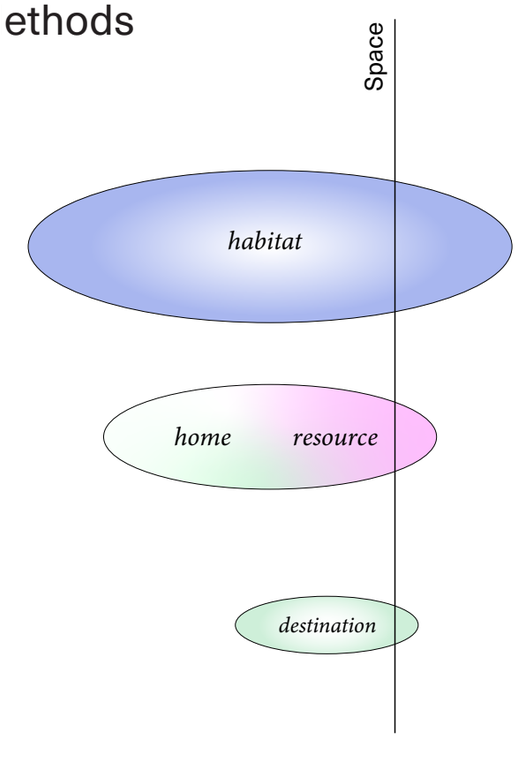


Challenging the traditional linear model of time, which often fails to capture the complex dynamics within ecosystems and human societies and the cycles that sustain them, I argue for adopting a helical model of time. This model better accounts for repetitive cycles and dynamic equilibrium within systems, as well as the abrupt changes that threaten their stability. By embracing Fernand Braudel's concept of the Longue Durée, we acknowledge that human perception of time and life cycles is just one among many. Exerting excessive force on systems whose cycles we do not fully comprehend risks causing irreversible damage to our habitat.

Different systems—in the case of this thesis More than Human, Human, and Tourist—experience time and occupy and influence space uniquely. Their needs and wants manifest through rituals and processes in shared spaces and in ever-evolving cycles. Sudden changes by one system to achieve its goals can shock other systems, especially those with longer temporal cycles, potentially initiating their collapse. Understanding the connection between temporal and spatial dimensions, as well as what drives them is crucial for sustainable interactions among different systems.

PERMUTATION

Spatial Methods



Building on our understanding of the nuanced interaction of time and space, it becomes clear that conventional spatial planning methods often fall short. Recent advancements in spatial practice emphasise the importance of integrating multidisciplinary knowledge, yet conventional layer-based analysis often overlooks the dynamic processes occurring between different systems.

Participatory methods democratise planning processes but often struggle to translate qualitative data into actionable spatial programs. Similarly, nature-based solutions are promoted to enhance biodiversity and ecosystem resilience but are frequently applied without adequate consideration of local contexts, leading to potential mismatches and unintended consequences (European Commission, 2021; Raymond et al., 2017).
Therefore, a new analytical and projective spatial method that leverages interdisciplinary insights into spatio-temporal processes is necessary, in order to fully understand the simultaneity and in-betweenness of different systems acting in space. The next chapter presents one such proposal.

Inversion

Threads

Tracing Threads

In the realm of spatial planning and design, conventional methodologies often fall short of capturing the complexity and dynamism of environmental and social interactions. Inspired by Donna Haraway's concept of string figures, the thread-tracing approach conceptualises spatial phenomena as a series of interconnected narratives, much like a tapestry woven from multiple strings. In our musical metaphor, this is akin to a composition made up of different, intertwining melodies. Threads are more than just mapping tools; they are dynamic pathways that interweave relationships and systematise interdisciplinary, interscalar, and intertemporal information across various systems involved in complex phenomena, known as hyperobjects (Morton, 2013).

This allows for connecting the perception and experience of complex spatial phenomena with spatial operational methods such as analysis, regulation, planning, and design. By visualising and understanding the 'entanglement' of various perspectives, threads reveal how actions within one domain can ripple through and influence others, highlighting causal relationships and spatio-temporal effects that traditional layer-based analyses often overlook, much like tracing the subtle variations in a melody through different movements.

Furthermore, by enabling the incorporation of specialised knowledge into planning and design processes, threads ensure that the voices and concerns of diverse groups are recognized and addressed. Moreover, this approach democratises the planning process by providing a framework that captures and integrates all stakeholders' lived experiences and expert knowledge. It allows for a participative approach that actively approaches communities' and actor points of view, enabling them to influence the planning outcomes that affect their environments and lives, harmonising the collective melody of community voices.

Threads are not merely analytical but also projective. By tracing each thread and identifying points of dissonance and harmony, the methodology aims to align conflicting interactions. This projective phase involves leveraging existing harmonious processes within each system to resolve dissonances. Through this structured approach, threads facilitate targeted and effective transformative and regulatory actions that can integrate diverse needs and impacts of different systems.

Threads are organised into perspectives—clusters of actors that share inherent operational logic which may disrupt or influence the operational logic of other clusters within the same space. Identifying these threads involves selecting actors that are most representative of the operational logic of each system, often focusing on those most vulnerable or with the strongest potential effect, which serve as critical points of intervention for a harmonised spatial approach, tuning the dissonant notes into a coherent melody.
Zooming into the coastal town of Njivice on the Island of Krk, tracing threads allows us to understand three distinct perspectives: More-than-Human, Human, and Tourist. Each perspective is encapsulated by a representative thread.

The More-than-Human perspective is represented by the Posidonia oceanica Meadows, highlighting the critical ecological functions of these seagrass beds in sustaining marine biodiversity and stabilising underwater ecosystems. These meadows underscore the inherent ecological processes and benefits they offer to the Adriatic marine environment.

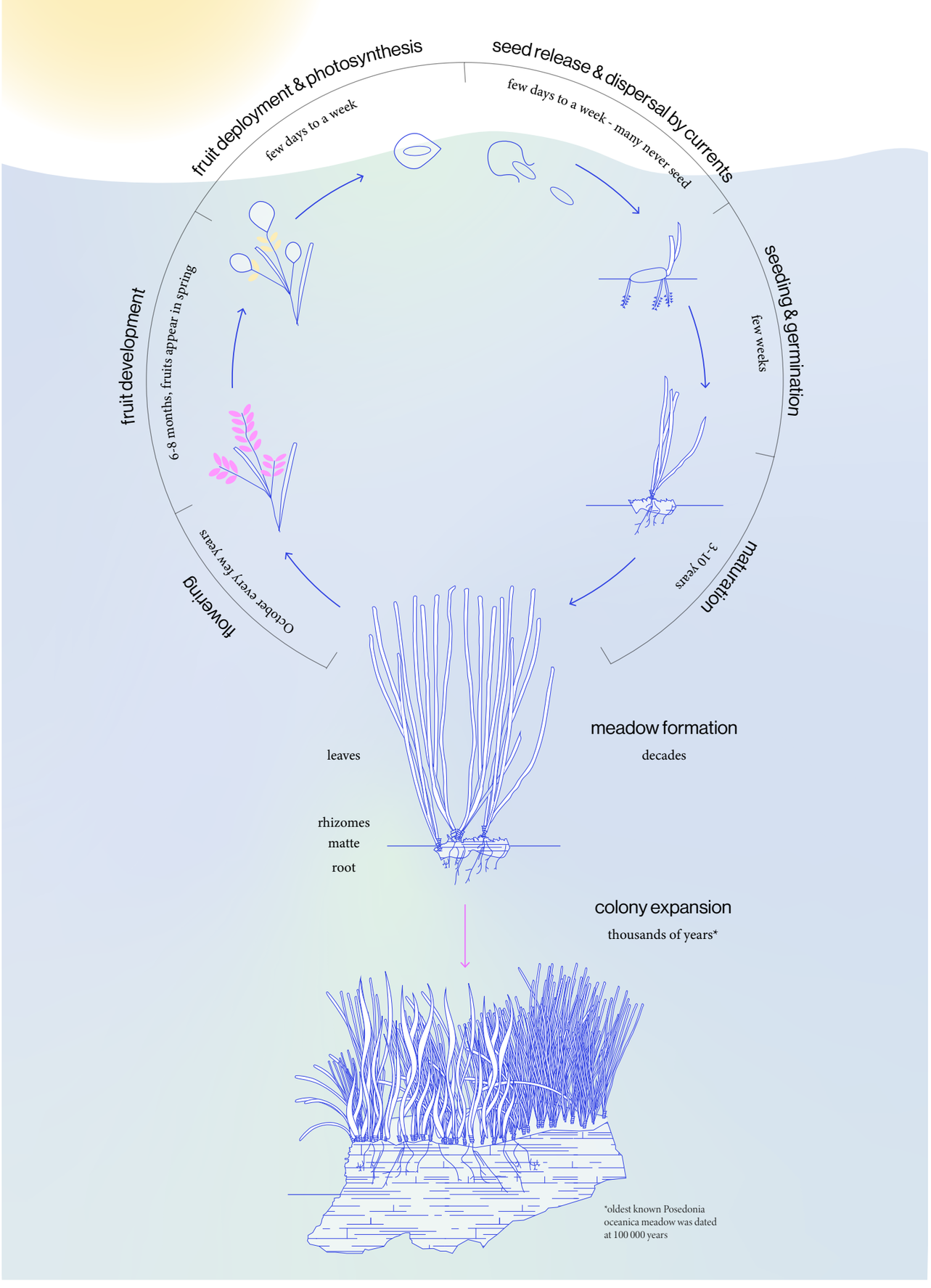
For the More-than-human, *space is a habitat.*

The human perspective explores the social fabric of the life of locals, emphasising the deep connection to traditions, culture, and spatial identity reflected in memory.
This perspective also recognizes the importance of temporal elements and spatial attachment, specifically in terms of memory and local practices, looking at where importance is placed and why. The thread explored as part of the human perspective is the one of a local fisherman, reflecting the historical and cultural ties with the region's marine resources.

For the Human, *space is a home and a resource.*

For the Tourist perspective, the focus shifts to the experiences and effects of tourism, as seen through the eyes of a Visitor. This thread traces the transformative impact of tourism on Njivice's landscape and community dynamics, exploring both the economic benefits and the challenges posed by increasing visitor numbers. Tourism is ultimately observed through the lens of alternative hedonism (Soper, 2008.), which critically observes the commodification of the contemporary notion of holidays and emphasises values such as exploration, recreation, rest, connecting with nature, and cultural exchange.

For the Tourist, *space is a destination.*



Example: *Posidonia oceanica Meadows*

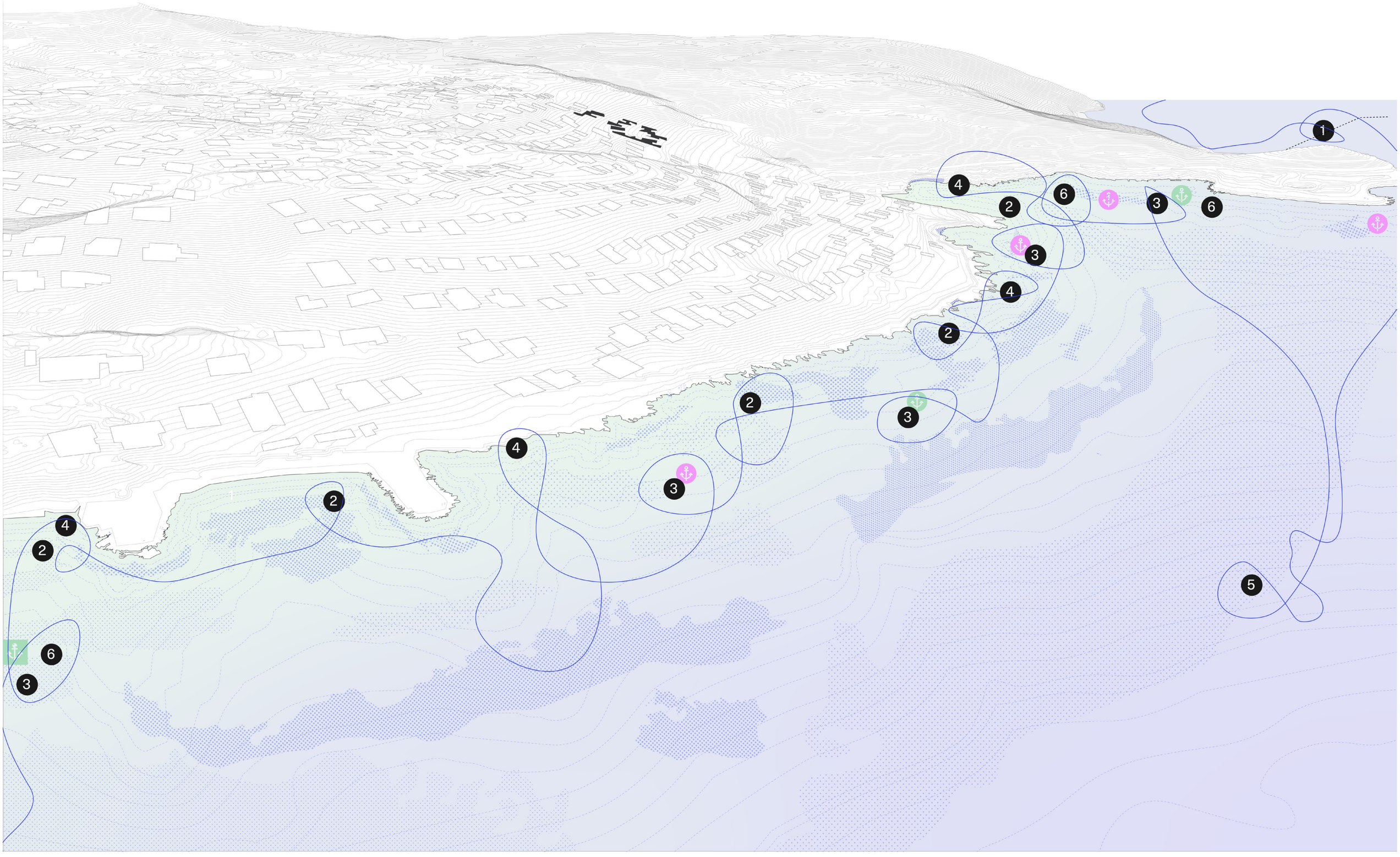
Posidonia oceanica, a seagrass endemic to the Mediterranean, plays a crucial role in the ecological and physical stability of the Adriatic Sea. Its dense meadows serve as vital habitats, offering breeding grounds and nurseries for numerous marine species, including commercially important fish and crustaceans. This biodiversity hotspot significantly contributes to marine productivity and ecological balance, enhancing the overall health of the Adriatic ecosystem.

The root systems of Posidonia oceanica have the ability to stabilize the seabed, preventing erosion and maintaining water clarity, which is essential for marine life and also beneficial for human settlements, but aslo for tourism, a major economic activity along the Adriatic coast. However, these critical ecosystems face threats from coastal development, pollution, and practices such as anchoring and trawling, which can destroy large areas of seagrass. The degradation of Posidonia meadows not only diminishes biodiversity but also reduces their effectiveness in protecting shorelines and maintaining water quality, posing long-term ecological and economic challenges for the region (Boudouresque, 2012).

This seagrass, known for its dense, underwater meadows, undergoes a complex life cycle. Flowering occurs in autumn, and fruits develop over six to nine months, eventually dispersing seeds that may float and wash ashore, enriching coastal lines. Seedling establishment is variable, depending on environmental conditions, and may span from a few months to years. Mature meadows are formed through the clonal expansion of rhizomes, which can extend over decades, solidifying the seagrass's role in marine biodiversity and shoreline stabilisation (Pergent, 2012).

Further tracing of Posidonia's thread will lead us to understanding the harmonies and dissonances occuring with other systems.

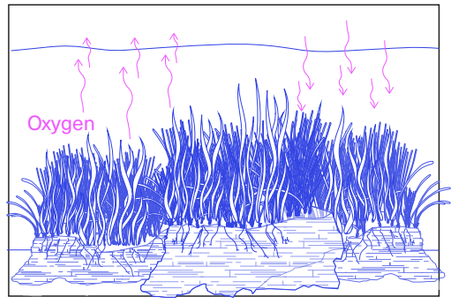
Inversion



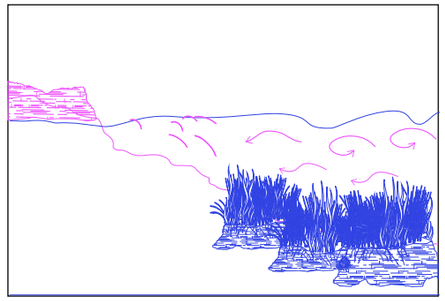
PERMUTATION

Inversion

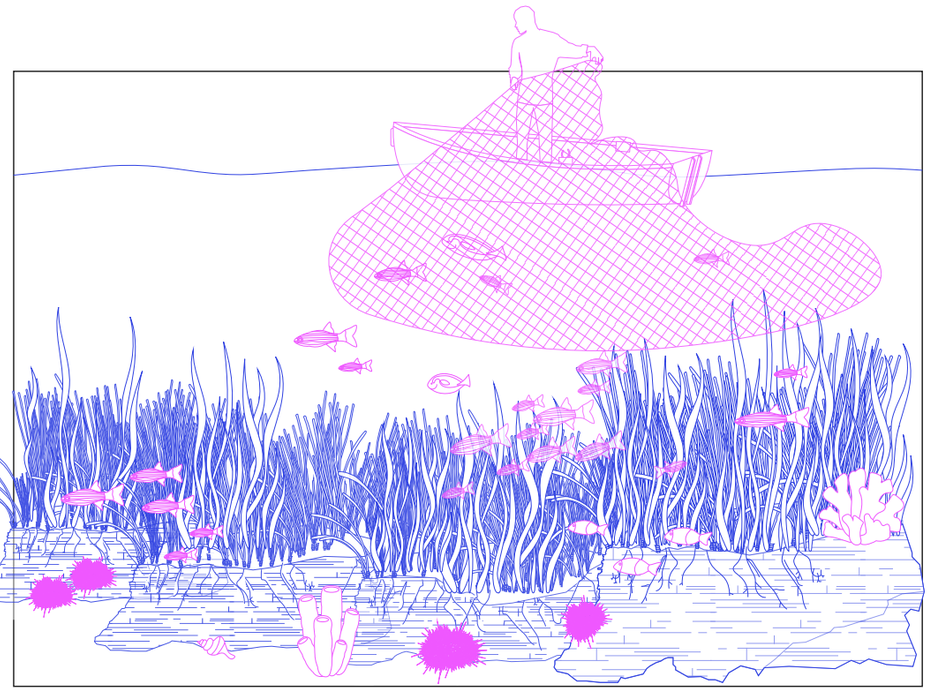
Harmonies with other systems



Carbon sequestration and oxygen production: *Posidonia oceanica plays a crucial role in carbon storage and acts as a significant oxygen producer, enhancing underwater and atmospheric quality.*



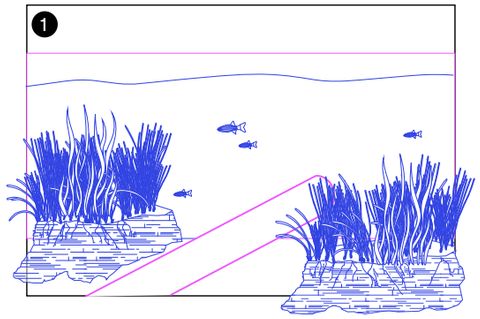
Coastline protection: *The accumulated plant material on shores forms banquettes that protect beaches against erosion, especially during storm surges.*



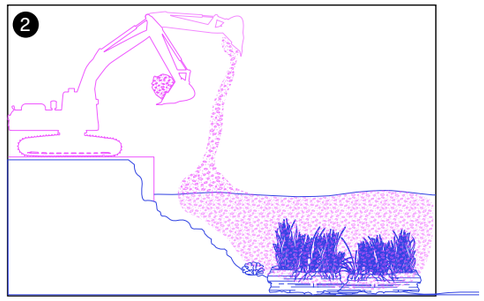
Essential marine habitat:
The meadows provide nursery grounds for numerous marine species, enhancing biodiversity and sustaining fisheries. (Pergent, 2012)

PERMUTATION

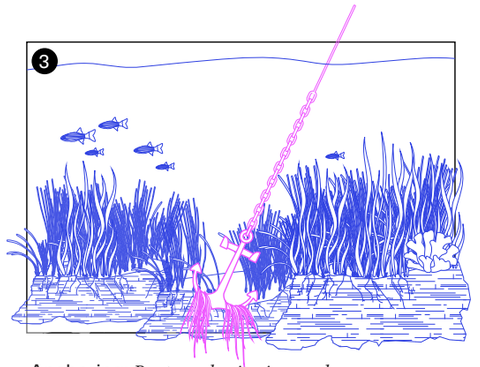
Dissonances with other systems



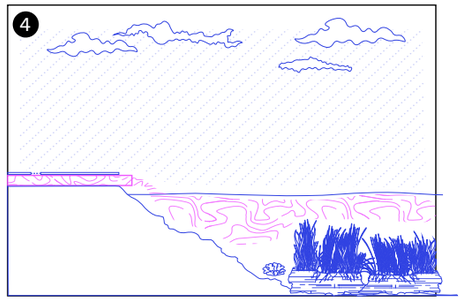
Underwater pipes and cables: *Installation disrupts the seabed, severing rhizomes and breaking up the meadows.*



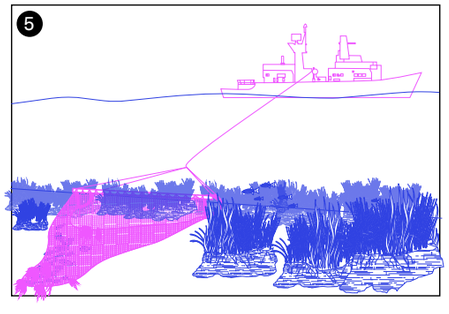
Sediment inflow: *Increased sediment from coastal development can smother seagrass, blocking light necessary for photosynthesis and growth.*



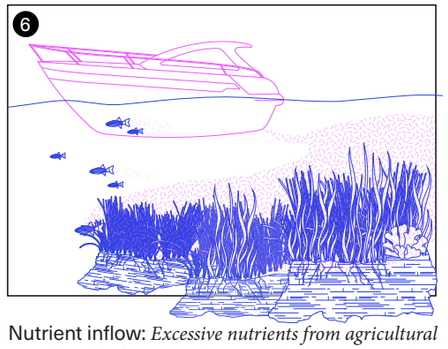
Anchoring: *Boats anchoring in meadow areas can tear up seabed vegetation, causing immediate and long-term damage.*



Freshwater inflow: *Changes in salinity from river discharges can stress seagrass, leading to degradation of meadows.*

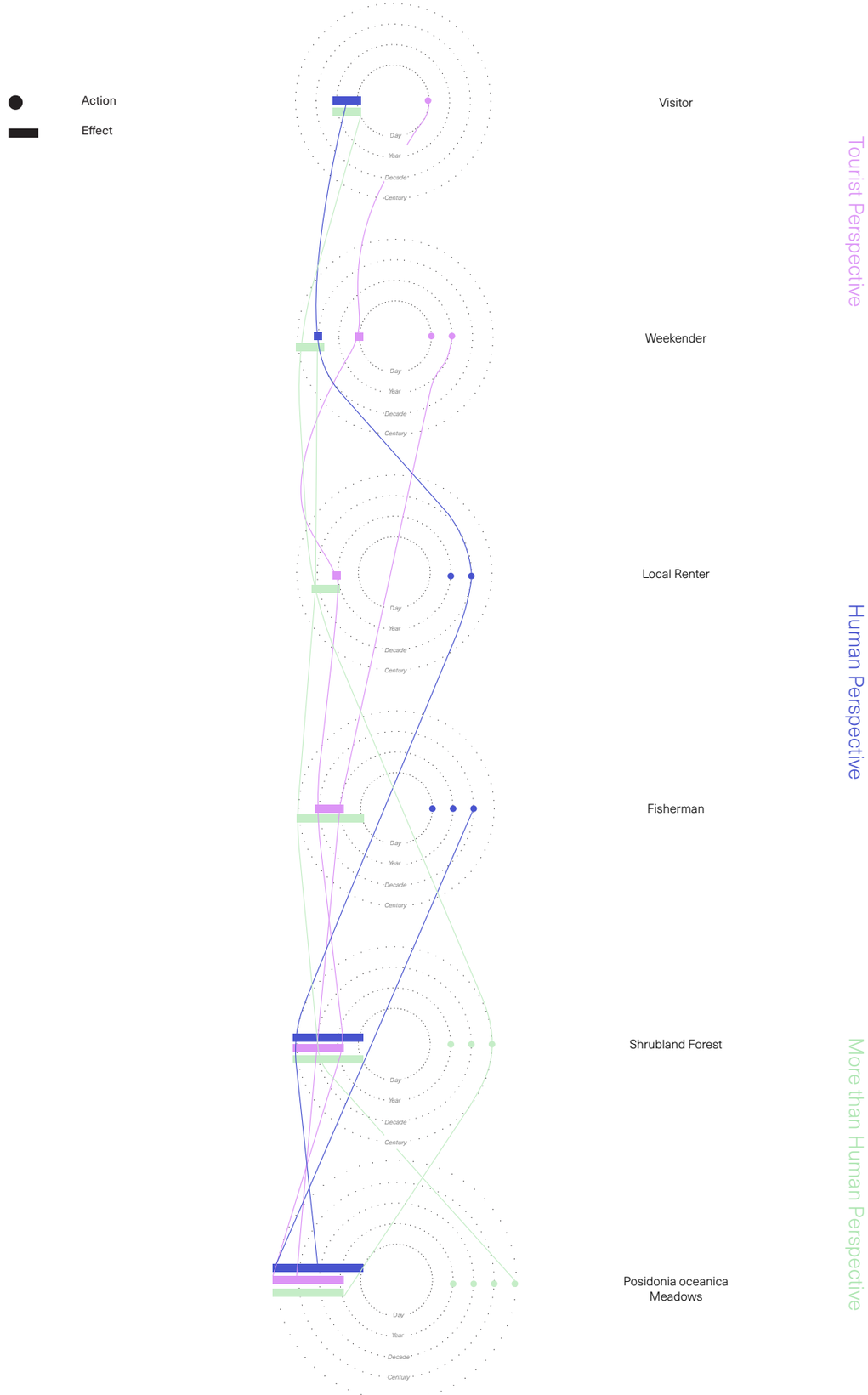


Trawling: *Fishing practices that involve dragging equipment along the ocean floor can devastate meadows, uprooting plants and disrupting the sediment.*



Nutrient inflow: *Excessive nutrients from agricultural runoff can lead to eutrophication, further stressing the meadows and leading to potential die-off. (Tunesi and Boudouresque, 2012)*

Inversion

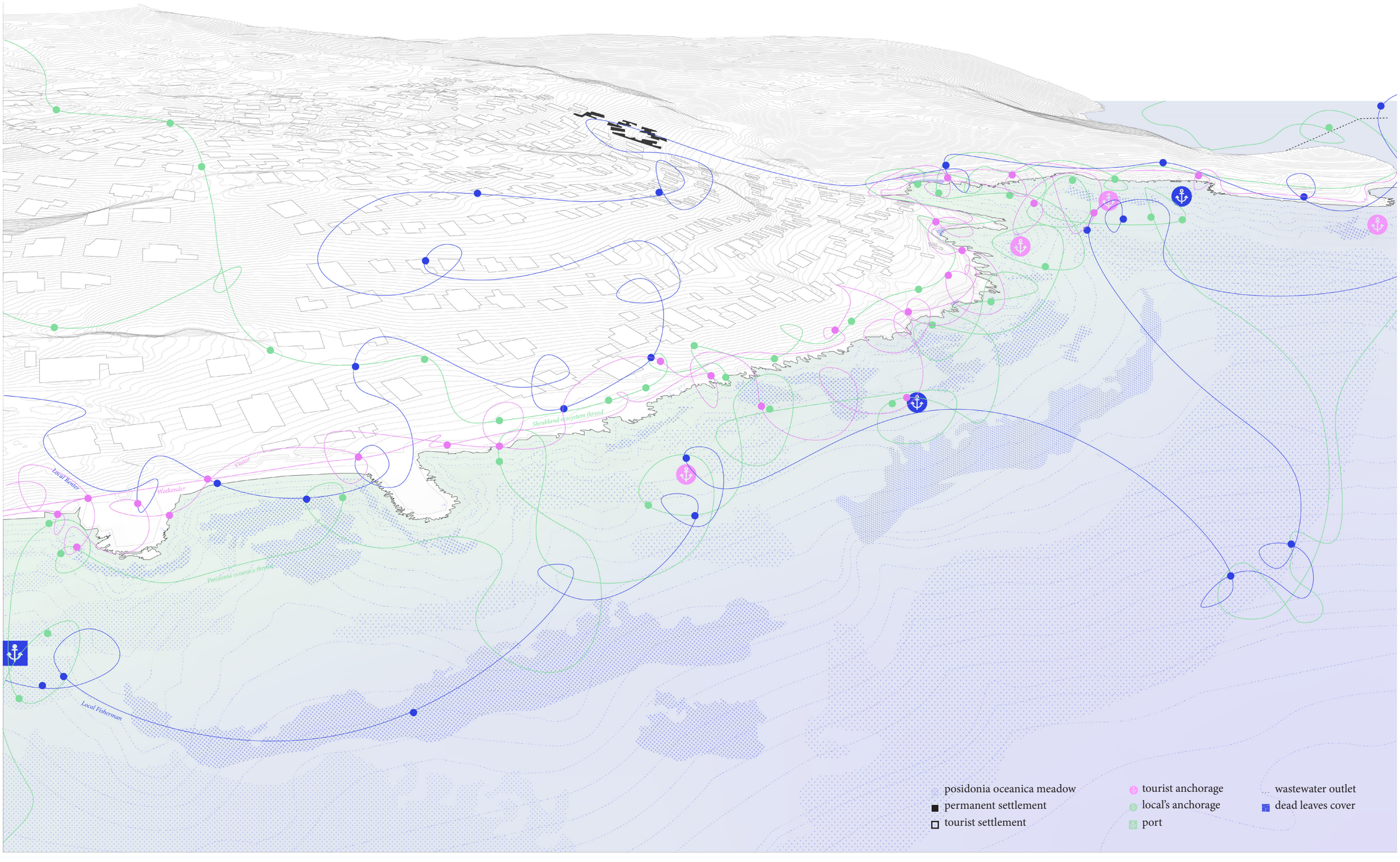


Detangling Dissonance

Following an individual thread sheds a light on how, where and how long different spatial systems operate, revealing why certain dissonances and harmonies might occur between them. Once this process is repeated for actors representative of different systems they belong to, we can begin detangling the threads in order to get an even clearer reading of the spatio-temporal effects of different actions happening within the systems. It offers direction to which exact dissonant processes we need to focus on, and what harmonising potential of different systems we need to protect and utilise.

The temporal dimension which the threads offer is particularly of interest. It highlights why purposeful tactical destruction and partial attempts of repair of bio-physical systems which take hundreds, if not thousands of years to re-establish themselves, should not be a legitimate course of spatial action. Juxtaposing action to a spatio-temporal reaction gives us a clearer idea of the consequences, or rather the price systems are paying.
The discrepancy between short term actions and long term consequences shows that enhancing the supportive capacities within the system is crucial. For instance, protecting the ecological functions of Posidonia oceanica meadows supports biodiversity and stabilises the marine-coastal interface, critical for both environmental and community resilience. Similarly, the analysis underscores the necessity of a communicative and adaptive spatial planning approach that respects the intricate interplay between bio-physical integrity and socio-economic dynamics. For example, protecting the integrity of local practices and industries promotes cultural sustainability and supports the local economy, counterbalancing the impacts of overtourism.

While, for now, these are just abstract conclusions, the upcoming chapter will detail strategies for applying these insights, proposing mechanisms to transform and regulate touristic spatial elements, and any programmes of requirement that this entails. By focusing on proactive care and targeted repair, it aims to harmonise conflicts between the natural environment and human activities. Uncertainty brought by the climate crisis has been purposefully left out of the spotlight in this tracing of threads, as it was important to de- tect those processes which are endangering the function of other systems without the added pressure of the changing climate. The following chapter will include scenarios of predicted changes in climate to showcase how a harmonised coast adapts to uncertainty.



PERMUTATION

Inversion

III.2 Harmonisation

the process of adding chords or harmonies to a mel- ody, enriching the music and pro- viding depth and texture. In this case - transposing existing melodies to harmonize with the rest (Kennedy, 2006).

Harmonisation

This chapter operationalises the findings identified by examining th threads of the More-than-Human, Human, and Tourist perspectives. It outlines the main types mechanisms used to achieve harmonisation, as well as identifying specific actions in terms of transformation. It situates these in the selected area, showing results of a potential harmonisation process. In dealing with uncertainty, this chapter outlines how scenarios can still be applied when planning for harmonisation.

Harmonising Dissonance

Mechanisms of Harmonisation

This thesis aims to empower urban planners to actively engage in spatial planning for tourism, shifting from merely mediating discussions between economic strategists and environmentalists to reconfiguring key spatial elements that underpin effective tourism processes. This shift follows an in-depth analysis of various system perspectives not only through the exploration of spatial elements, but also through thread tracing, where dissonances and harmonies among systems are identified and their temporal dynamics examined. The key approach of this harmonisation is the care for and repair the coastal environment through educational, regulatory, and transformative measures of touristic spatial elements, aimed at harmonising those processes which were found to be in dissonance. The degree to which the dissonances are “resolved” will vary, in a recognition of the dynamic equilibrium inherent to all systems. Those dissonances which have all encompasing consequences, such as a complete stop to essential processes, are prioritised.

Actions can be grouped into three interrelated and co-dependent categories with key mechanisms for harmonising dissonance:

1. Educational: *Protocols of Care and Repair*

This refers to targeted research, monitoring and analysis activities, and the subsequent education of all relevant stakeholders. The objective of these activities is the creation of a Protocol of Care and Repair - a set of continuously updated recommendations on how to best care for and potentially repair critical processes.

Tracing the threads of the Posidonia oceanica meadows, it became clear that many dissonances occur due to a lack of awareness (Tunesi and Boudoursque, 2012). The meadows are only monitored in a handful of locations, and the impact of tourism and other human activities is not analysed and communicated. In order to act upon the dissonances existing in such a complex and sensitive system, there needs to be a mechanism that supports and integrates scientific findings with other activities. In this thesis, I propose threads as the bridging method, bringing scientific knowledge about complex systems and processes closer towards its spatial. Protocols of Care and Repair would not be yet another environmental protection policy but a key mechanism that guides the creation of any spatial regulation, policy or intervention.

2. Regulative: *Integrated policy, planning and procedure*

Following the recommendations set by the Protocols of Care and Repair, key policy, planning and other relevant procedures need to be identified and modified or added. As concluded in the Dissonance chapter, many issues surrounding spatial transformation stem from a lack of integration across policies and procedures, as well as a lack of understanding of the domino effect created as a result. Protocols of Care and Repair are tasked with clearly identifying these causalities.

Here we have identified the causal relationship between laws regarding the transformation of land use after a forest fire, which incentivises arson for the purpose of obtaining a construction license for a piece of land that was previously protected as a green area, which not only creates dissonance on that specific portion of land, but oftentimes escalates into large wildfires that destroy and endanger both human and more-than-human systems. The task of harmonisng policy and procedure puts the *Protocols* into practice.

3. Transformative: *Reconfiguration of Spatial Elements*

Both as a result of an integrated regulative framework and the recommendations stemming from the Protocols of Care and Repair, a new approach to spatial design can be implemented. Going back to the metaphor of music, in order to harmonise dissonance, we need to select which elements remain, and which we reconfigure. Especially when it comes to repair, intervention through design will be necessary.

For this project, I will focus on reconfiguring the Touristic Spatial Elements of attraction, in this case the beach; accommodation, in this case private rental apartments; and transportation, in this case car infrastructure. The aim is to offer an integrative approach to transforming areas currently in dissonance due to a full appropriation of space for tourism activities, as well as to show the adaptive potential of such interventions.

Reconfiguring Touristic Spatial Elements

For the purpose of clear narration and exemplification of the harmonisation process, it will be described first through situated transformations of touristic spatial elements, scaling up towards typical strategies and applied Protocols of Care and Repair as well as corresponding regulatory actions. In reality the process would occur in the other direction first, after which it would enter a cycle of inputs and outputs of the Protocols of Care and Repair, as shown in the following sub-chapters.

Highlighted by the paradox of attraction, tourist attractions — particularly beaches — serve as focal points where numerous processes converge. These attractions not only motivate the entire operational framework of tourism but also guide the positioning and organisation of other touristic elements. Consequently, they are also points of vulnerability where dissonances frequently emerge, potentially undermining the space's ability to function as a destination, home, resource, and habitat. This project aims to leverage the organisational potential of these attractions, using various types of coastal configuration as close-up frames to illustrate this approach.

This approach will again be demonstrated in the tourist town of Njivice, starting with a detailed examination of four representative attraction areas: *the pier, town beach, promenade beach, and natural beach*, along with their immediate settlement surroundings. This element configuration scale illustrates how the methodology applies to varied configurations of touristic spatial elements specifically. This study will extend to how these elements function within the entire settlement and further to a strategic plan across Krk Island, demonstrating the comprehensive application of spatial planning methods. For attractions and more-than-human systems, the strategy includes establishing new protective categories and corridors. The implementation will involve spatial redesigns necessitating changes in accommodation and transportation, and adjustments to various functional requirements.

The analysis of accommodation will address the major issue of "apartmanization," which causes significant conflicts. Implementing regulations, such as taxation on private accommodations, will indirectly benefit other lodging forms like hotels. Therefore, universal spatial guidelines for all types of accommodations are essential. In transportation, the goal is to diversify and effectively manage options through strategic control and planning, supporting the broader environmental rehabilitation of the coastal areas.

PERMUTATION

To address the dissonances identified through tracing of threads, four main transformational actions are taken:

Reconfiguration of coastal corridors

Issues of freshwater inflow, sediment inflow, transformation of physical space, decrease in fish fund, and decrease of the attraction can be addressed through reconfiguration, zoning, and protection of blue and green corridors around the beach. Repairing Posidonia oceanica meadows can mitigate wave turbidity and coastal erosion while purifying waters and providing habitat for a declining fish fund. Expanding and segmenting the green belt into functional vegetation zones enhances resilience, from an erosion protective zone on the coastal edge through a temperature and wind regulation zone to a fire resilient zone near built areas.

Retreat of built areas

To allow for protective and interconnected corridors, and to tackle dissonances such as sediment and freshwater inflow, rising prices, transformation of physical space, cultural erosion, and overcrowd ing, non-permanent built areas need to retreat. This retreat, typically away from the coastline, improves soil and vegetation conditions, enhancing temperature and water retention and preparing for future challenges. This significant transformation should begin with gradual policy and regulation steps, followed by the dismantling of transportation infrastructure.

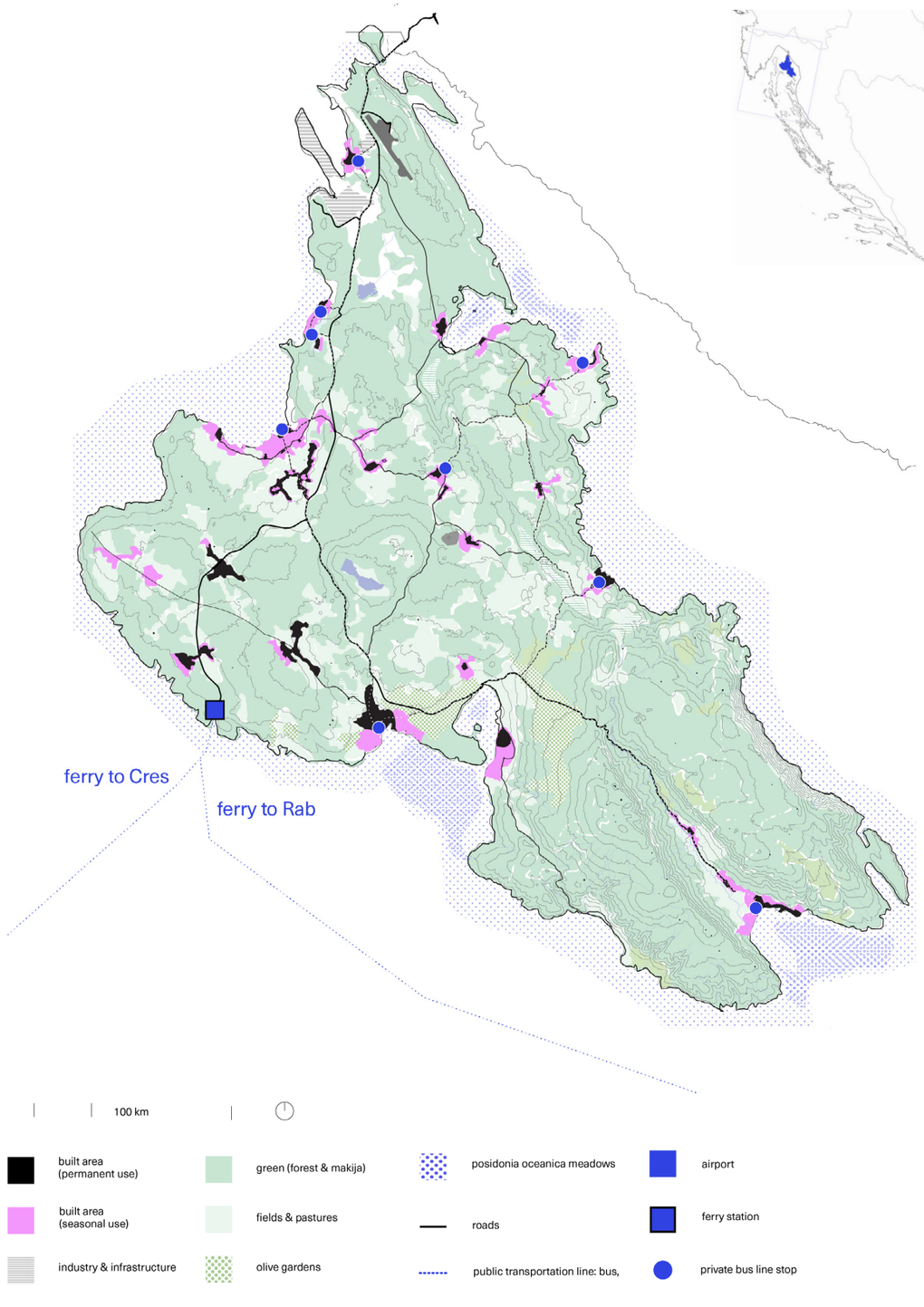
Shift in programme

Addressing primarily apartment settlements, the shift in programme tackles issues of cultural erosion and physical transformation, indirectly reflecting on overcrowding, rising prices, and decreasing attraction. This shift involves converting apartment areas into structures that meet the needs of permanent residents and preserve local identity. Sometimes, this shift allows the creation of spaces like museums or transportation hubs that also accommodate visitors.

Diversification of mobility

To address dissonances like car dependency and congestion, de- crease of the attraction, and transformation of physical space, new transport modes are introduced, and public transportation is strengthened by adding new stops and structures, as well as enhancing connections to areas of interest through well-planned paths.

Harmonisation



PERMUTATION

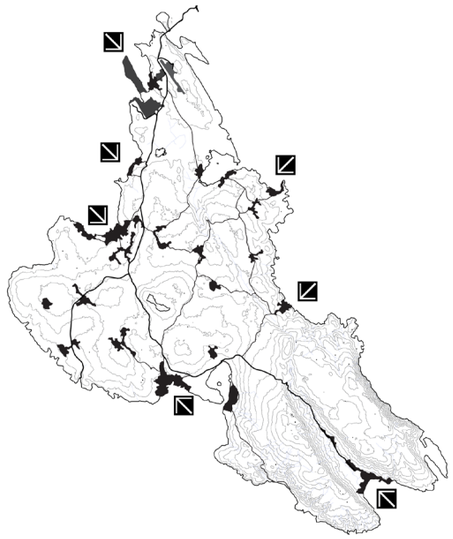
Island Reconfiguration: *Current Situation*

The island of Krk, located in the Kvarner Bay of the northern Adriatic Sea, is one of the two largest islands in Croatia, competing with the neighbouring Cres, depending on the tides. The main town on the island is itself called Krk, with other several prominent towns including Omišalj, Njivice, Malinska, Porat, Baška, Šilo, and Vrbnik, each contributing to the island's cultural and economic diversity.

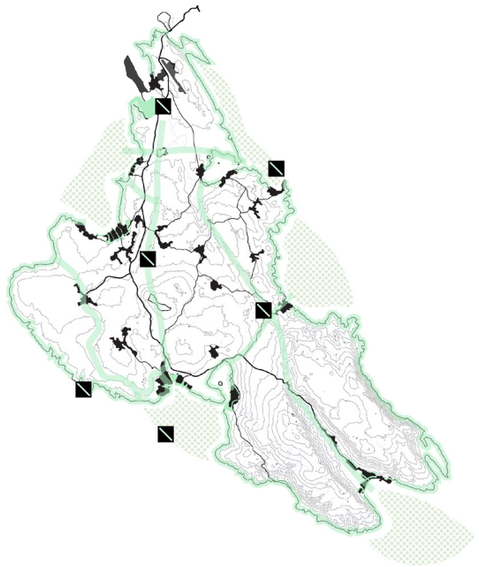
It has a rich history, with continuous habitation since the Neolithic period. It was influenced by the Romans (who called the island *Insula Aurea,* meaning the golden island, due to its natural riches), Byzantines, and Venetians over the centuries. Today, the island has a population of around 19,383, with many residents engaged in tourism and agriculture.
Krk's geography is diverse, with the central and western regions characterized by fertile fields and dense forests, where vineyards and olive groves thrive. The island's rocky northern and southern parts are used primarily for pastures, supporting sheep and Istrian buffalo farming. Krk enjoys a Mediterranean climate with mild, rainy winters and hot, dry summers. The average summer temperature is around 25°C, and the island receives approximately 2,500 hours of sunshine annually, making it one of the sunniest areas in Europe. Agriculture on Krk is diverse. The central and western parts of the island are dominated by vineyards and olive groves, producing high-quality wines and olive oil. Aromatic plants such as rosemary and lavender are also cultivated. The rocky northern and southern regions support pastoral activities, with sheep and Istrian buffalo farming being prominent. However, fishing remains one of the most prominent activities of the area.

Tourism is a vital part of Krk's economy but has led to several typical negative consequences, already elaborated within this thesis. Over-construction, particularly of the rental apartments and beach facilities, has led to the destruction of natural beaches and landscapes. This rampant development has also caused congestion, especially during the peak tourist season, straining the island's infrastructure and affecting the quality of life for residents and visitors alike. (Krk. hr, 2023)

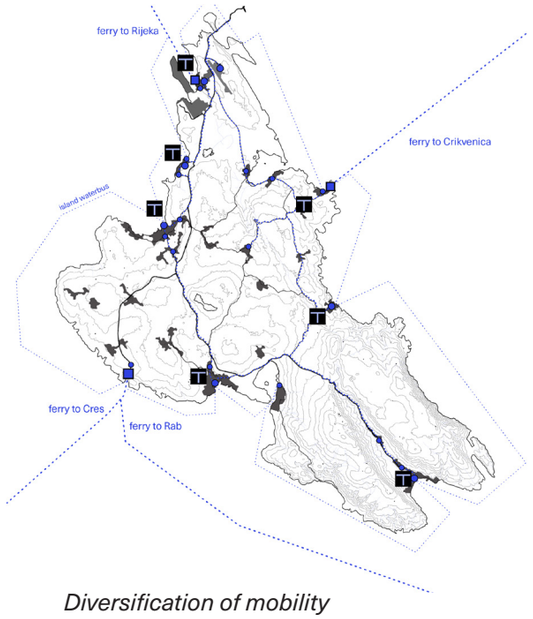
Harmonisation



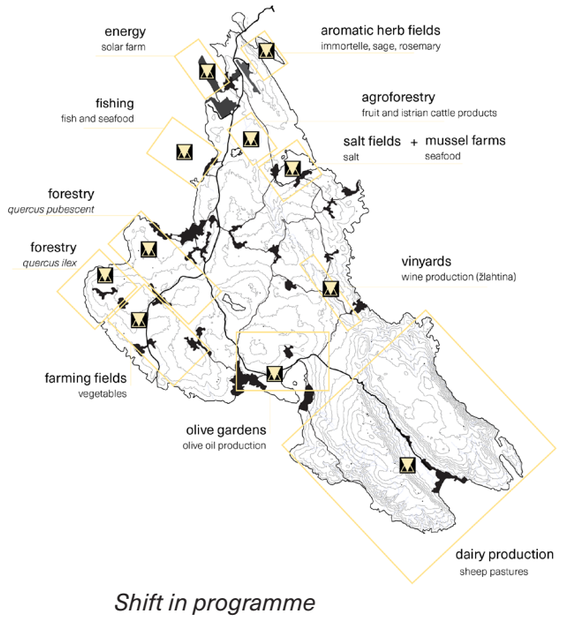
Retreat of built areas



Reconfiguration of coastal corridors



Diversification of mobility



Shift in programme

PERMUTATION

Island Reconfiguration: *Harmonisation Actions*

On an island scale, the application of the four transformative mechanisms involves identifying critical vulnerable areas and areas of opportunity. Initially, a general halt on construction, particularly of rental properties, is recommended.

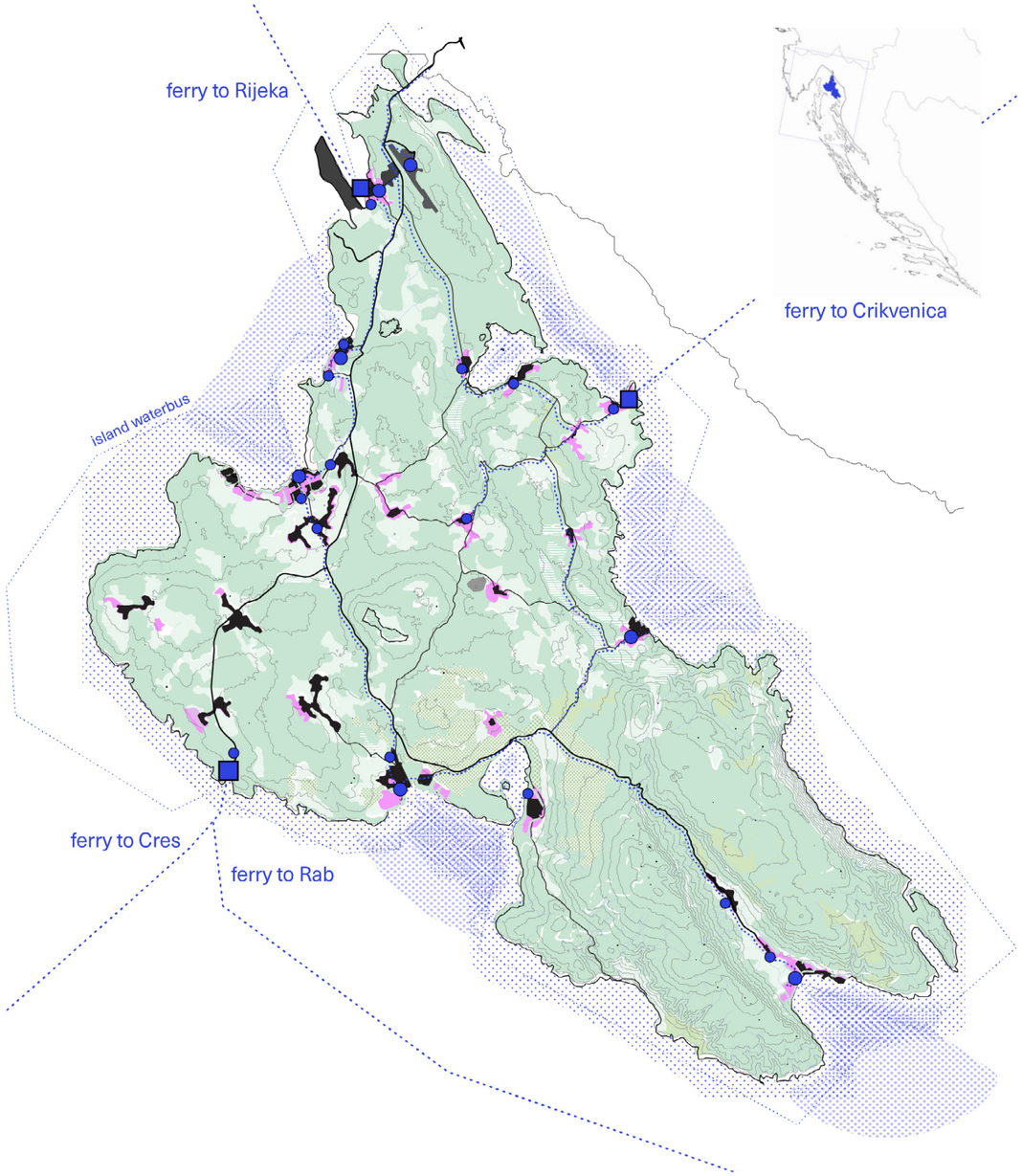
Along seven settlements, a retreat of built areas away from the shoreline is advised, due to their vulnerability and proximity to the shoreline, putting all local systems at risk. The retreat is to be handeled strategically at a local level through mediation and expropriation of land.

Defining critical green corridors, such as coastal belts and connecting lower areas and ravines, is essential to apply protocols and potential transformations, ensuring their system capacities and harmonisation potentials are preserved.

For transportation, two new public options are introduced with two sub-categories. Ferries and buses focus on a) internal island connections - shuttle and waterbus; and b) external connections to other islands and the mainland - buses and ferries.

To move away from the monoculture of tourism and restore local identity, local agricultural practices are incentivized and reintroduced in traditional areas. As the island transitions to renewable energy, the LNG terminal is transformed into a solar farm, leveraging the island's abundant sunlight.

Harmonisation



PERMUTATION

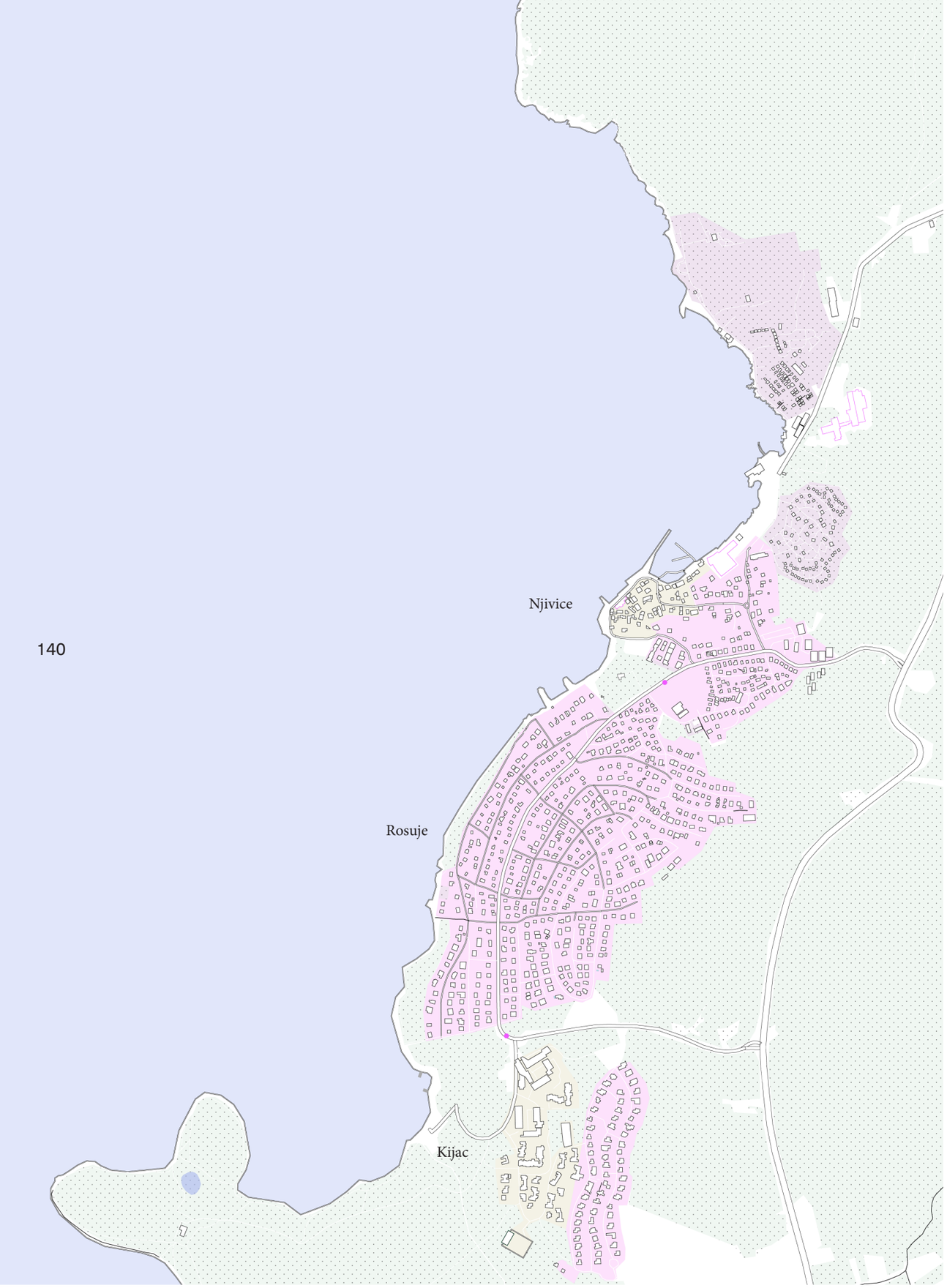
Island Reconfiguration:
Krk with Harmonisation applied

The cumulative result of a harmonisation strategy for the island shows significant strengthening of the biophysical systems, particularly in vulnerable areas, to protect the functioning of other human activities, especially tourism.

Permanent residency is prioritized over tourist properties and infrastructure. The newly introduced public transportation system clearly reflects this priority, as do the new opportunities created by the reintroduction of ecological agricultural practices. An important factor in these agricultural efforts is the Protocols of Care and Repair, which educate and monitor agricultural activities to promote regenerative practices and recognition of cyclical patterns of different processes along More-than-Human and Human systems. The application of such an approach would not be possible without tracing the threads of different systems, a method which needs to be periodically redone, taking into account the new inputs from the system resulting from the harmonisation itself.

The harmonisation approach seeks to “untangle” those relations which lead to the most critical effects between systems, while recognising that perfect harmony does not exist. This is therefore a continuous effort of reading the spatio-temporal elements and their relations in order to not only create more harmonious spaces and territories, but also become aware of potential dissonances between systems before they occur.

Harmonisation



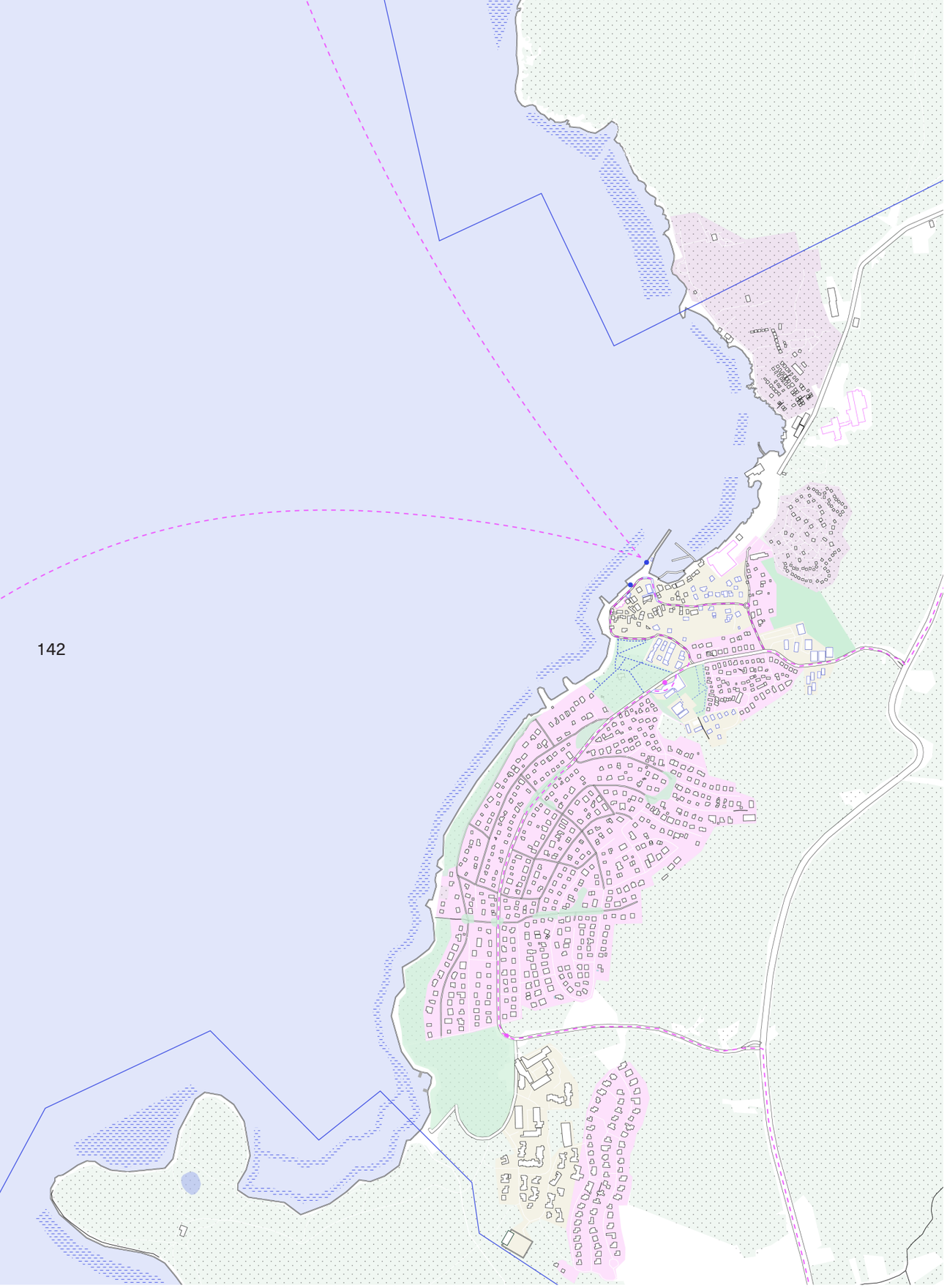
Ensamble Reconfiguration:
Njivice Current State

The tourist town of Njivice, originally a fishing village, has a rich histo- ry indicated by its toponym and archaeological evidence suggesting it was once an agricultural area. The town's development into a tourist hub began with the construction of Hotel Jadran (*Hotel Adriatic*) in 1930. Shortly thereafter, Villa Rosuja, meaning "morning dew," became the first vacation house built south of the village by Austro-Hungarian General Antun Kosta. He also commissioned the construction of a small, unpaved promenade along the coast. This pathway, along with the surrounding greenery, eventually transformed into the official coastal green belt.

In the 1960s, spurred by Yugoslavia's inaugural tourism incentives for workers, the apartment settlement Rosuje began to develop around Villa Rosuja. By the 1980s, a worker settlement, Kijac, was established further south of Njivice and Rosuje to house foreign workers employed at the nearby crude oil transportation facility. Presently, Kijac has more permanent residents than Njivice itself, supplemented by its own rental apartment community.

Over the years, the Rosuje area has undergone significant expansion, creating a continuous urban connection between Njivice and Kijac, extending to the main island road. This expansion contravened coastal zone regulations, highlighting the pressures of urbanisation. Many individuals who built secondary homes in the area 50 years ago have now sold or converted them into rental properties, resulting in a transient population with average stays of about seven days, who lack any meaningful connection with the space. This intensified urbanisation has not only posed environmental challenges but also impeded Njivice's ability to improve the quality of life for its residents and encourage secondary homeowners to retain their properties. The transformation from a tranquil fishing and agricultural locale to a busy tourist destination exemplifies broader changes affecting the social and environmental landscape of the area.

Harmonisation



Ensamble Reconfiguration:
Njivice with Harmonisation applied

In order to stabilise the systems in dissonance, particularly the identity and economic integrity of the local population, as well as the more-than-human processes, the aforementioned harmonisation mechanisms and their resulting transformative actions are applied to the coastal town of Njivice.

Primary objectives in this case were to strenghten the human and more-than human perspectives in regards to tourism, while still understanding in which way tourism constitutes the current identity of the place. The strenghtening of the coastal green corridor and providing infrastructure and design for a more-than-tourist social and economic life of the area and its inhabitants is crucial, not only for those actors that do not directly participate in tourism, but also for tourism itself, as explained through the paradox of the attraction.

In this plan, Posidonia oceanica fields are etablished along the shallows in order to protect the existing meadows, and help restore the damaged habitat along the seabed, in turn also providing defense against erosion and pollution. The green coastal belt is protected and its restoration and expansion are initiated to provide sufficient protection from heat and wind, as well as to perserve the vulnerable conditions of the coastal edge. As this will require obtaining more surface, expropriation strategies must be devised and initiated as soon as possible. Expropriation should also be used in order to shift the priority of spatial use to local inhabitants, by converting those structures that posses facilities ment for permanent occupation into apartments and other social functions according to local needs.

This will now be examined on a hyper-local level, following the organisation according to coastal type: *the pier, town beach, promenade beach, and natural beach*

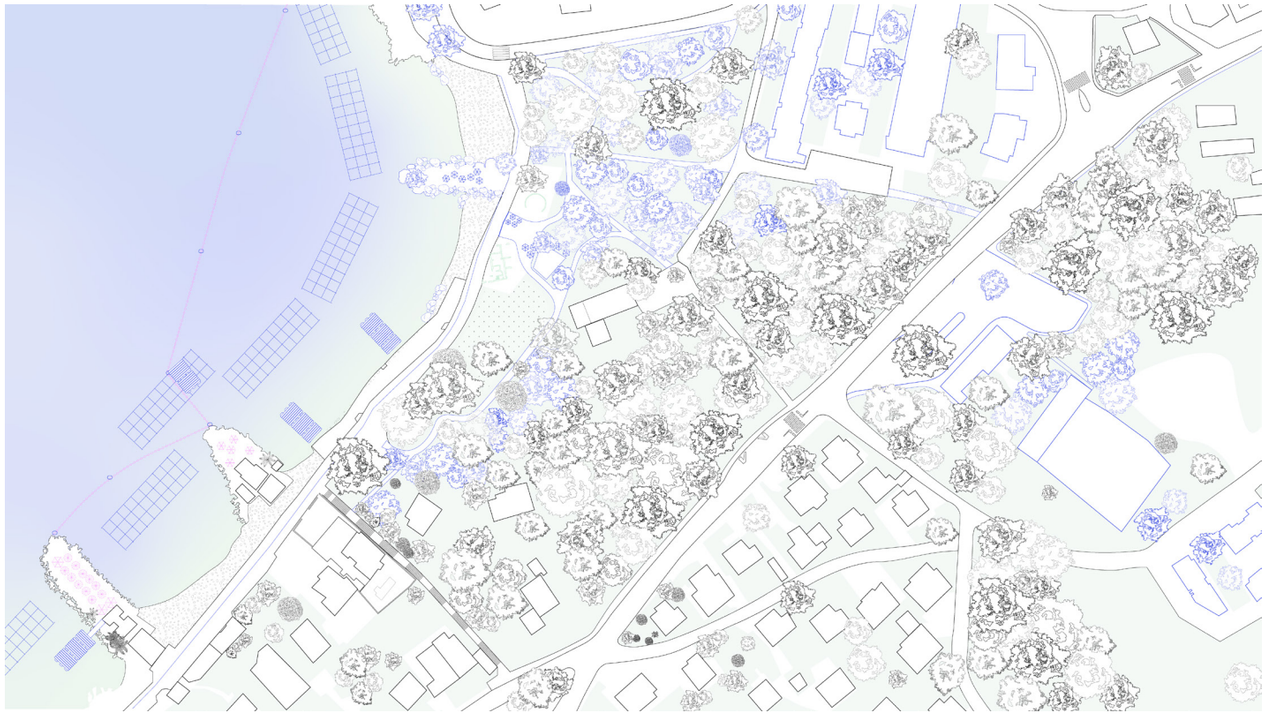
Harmonisation

Element Reconfiguration:
Pier + Town

We start the detailed typical exploration with a coastal area dominated by a pier, where the natural edge has almost disappeared. This pier merges into a small town populated by permanent residents. Currently, the town's public spaces and facilities are mostly active during the tourist season. Access to the town center is restricted to cars, dedicating one side of the area to parking. The local port, predating the tourism boom and originally a fishing hub, now mainly serves tourist boats, sidelining the local fishermen. Their cultural presence has diminished, as they have been relegated to merely supplying food for local markets and restaurants, largely unnoticed. In order to achieve more harmonious spatial relationships, we introduce the spatial transformations. The first significant change is the conversion of a building by the pier into a fish market, directly opposite the town's renowned fish restaurant. This placement reduces logistical hurdles for fishermen and costs, while bolstering the res taurant's and town's identity as a fishing hub. Such enhancements align well with tourist interests, offering them a glimpse of authentic local culture and cuisine.

On another corner, a museum dedicated to local culture is set to replace a building currently used for rental apartments and fast food. This structure's historical significance makes it an ideal venue for a cultural program, enhancing its appeal to both locals and tourists. The museum will showcase extensive local history, including nearby Roman ruins and traditional landscapes like the previously prevalent oak forests, olive groves, and underwater ecosystems. It will also serve as a cultural center for local heritage activities and might include a small library or bookshop with a cafe, weaving it into the daily life of both residents and visitors.

Along the pier, changes continue with the removal of parking spaces and restrictions on vehicle access, reserving passage solely for residents and public transport. A new bus stop will support a local bus service, potentially linked to a new public ferry line, enhancing local connectivity while reducing the demand for private tourist boats that disrupt local fishing activities and harm the seabed. The implementation of green spaces and permeable surfaces along the pier will provide natural defenses against extreme weather conditions. Additionally, efforts to restore marine health include planting lines of Posidonia oceanica and deploying ecological buoys to manage wave turbidity and ensure the vitality of the ecosystem.

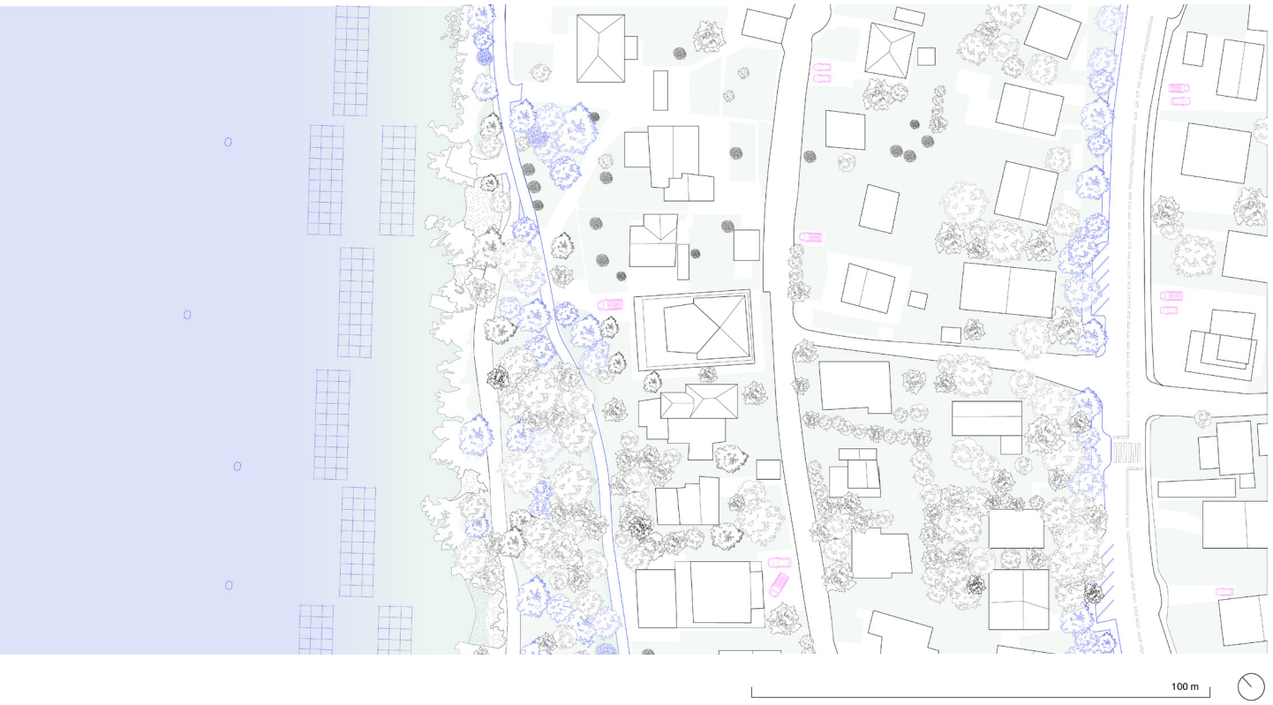


Element Reconfiguration:
Town Beach + Edge

Town beaches, typically adjacent to urban centers, often suffer from density imbalances compared to the town proper, with rows of apartment buildings close by. These beaches are favored by day-trippers and are notorious for overcrowding. To maximize space, drastic alterations like concrete reinforcements or excessive use of small pebbles are common, both of which damage marine and shoreline ecosystems. This results in sediment build-up and reduces soil permeability. The constant erosion of concrete structures and displacement of pebbles by Jugo storms necessitate frequent, costly refurbishments.

Moreover, the commercial exploitation of these areas exacerbates the situation. Many beach cafes, apart from renting out tourist gear, encroach upon the scant green spaces, including an archaeological site featuring a 4th-century villa rustica. These historical ruins are under concession, leading to the incongruous placement of cafes and seasonal amusement parks within the site. The transition from the town to typical apartment settlements is marked by a stark absence of public spaces or amenities, with large, mostly vacant apartment blocks dominating the landscape, exacerbating the local housing crisis. Even the main road bus station serves dual functions as a parking lot, flanked by a dilapidated hotel.
The paradox of enhancing attractions for profit, which ultimately leads to their degradation, calls for a revised approach. A small tombolo, previously removed, will be reinstated to stabilize the shoreline during strong waves, while the concrete blocks will be allowed to naturally degrade. Beach nourishment will adhere to protocols aimed at habitat preservation rather than tourist accommodation. In- stead of permanent and intrusive structures like plastic trampolines, seasonal floating piers will meet temporary needs without long-term environmental impact.

The sole remaining green area is earmarked to become part of a future extensive green belt, starting as a city park that incorporates local vegetation and partially exposed archaeological features. A small, relocatable cafe and information center will be established in areas confirmed to be devoid of archaeological significance. Pathways from the park will lead to an upgraded bus station equipped with modern facilities, including an e-bike rental service. Nearby, the old hotel will be transformed into a facility serving the community's needs, such as a school and kindergarten. The large, underused apartment blocks will be converted into social housing for local residents.



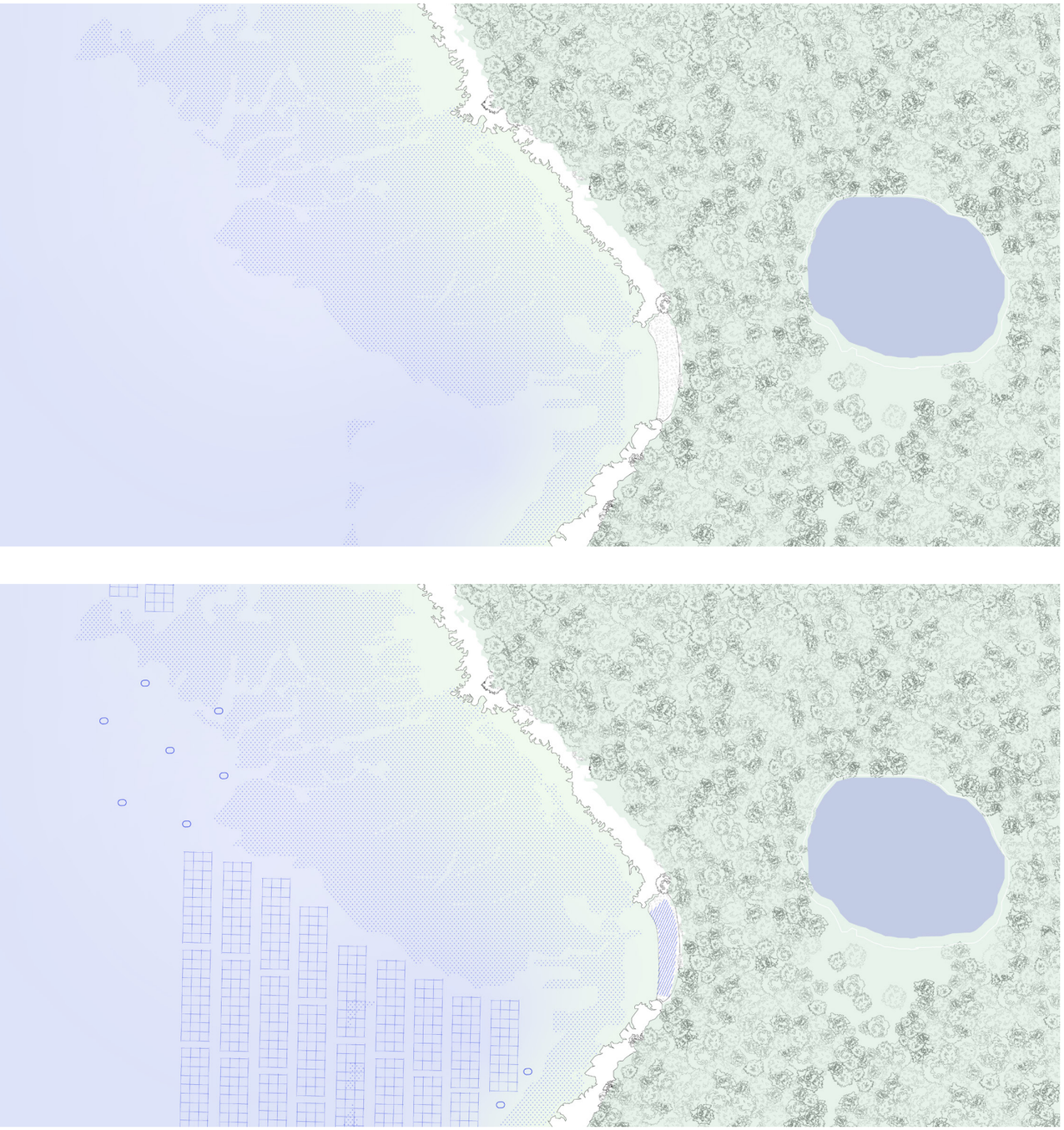
Element Reconfiguration:
Promenade + Rental Apartment Settlement

Promenade beaches, often adjacent to secondary houses and rental apartments, are a prevalent coastline type. Despite the requirements of the Protocol on Integrated Coastal Zone Management in the Mediterranean, which Croatia has ratified, the prescribed green belt has diminished over the past two decades. This reduction results from dubious planning practices and the manipulation of planning laws, where the built area increasingly encroaches on the coastal edge. Although the houses still align with the old coastal zone line, the road above and the path below have each been widened to over 3.5 meters, with a new parking lot reducing the green belt's surface area significantly. The apartment houses now occupy lots with minimal permeable surfaces and expanded built areas, likely violating planning laws. Additionally, construction has intensified, with several large-scale building sites often emerging near the water.

Recently, the expansion of the promenade involved destroying rocks and overlaying them with a mixture of sediment and concrete, contaminating both the water and the beach. The area also serves as a popular anchorage spot in the summer, exacerbating the degradation. This has confirmed a pattern of induced demand for beach space: areas augmented with pebbles or concrete blocks become overcrowded, prompting local authorities to expand these sections further, undermining the natural allure of the site. There is also a notable link between the increased capacity of apartment settlements and the growing pressure on the beach.

To harmonize this area, a strategic retreat and reconfiguration of the green corridor are essential. The first step involves scaling back the transportation infrastructure by reducing road and parking sizes and integrating more green spaces. For the beaches, a rigorous care and repair protocol is necessary. This includes establishing monitored Posidonia plantations in the shallows to restore seabed conditions and allowing the dead matte of Posidonia to accumulate on the beaches, protecting them from erosion. This accumulation is strategically removed to balance tourist needs with environmental preservation. Furthermore, construction within 50 meters of the shoreline is closely monitored to prevent illegal sediment and concrete deposition into the sea. To mitigate anchor damage to Posidonia, ecological buoys are installed along the coastline, ensuring the sustainability of these marine ecosystems.

Harmonisation



Element Reconfiguration:
Natural Beach + Shrubland Forest

Natural beaches, situated between two coastal settlements, are increasingly rare. Typically featuring over 100 meters of undeveloped green edge, these beaches remain largely pristine, though occasionally marred by illegally placed concrete blocks by visitors. The main threat to these areas is the growing number of visitors, including those reaching less accessible beaches by boat. This traffic exacerbates environmental damage as anchors drag across the seabed and release nutrients into the water, further disturbing these ecosystems.

To preserve these critical natural buffer zones, stringent protection measures are essential. Protocols of Care and Repair must be established and enforced rigorously. The surrounding makija shrubland forests and Posidonia oceanica meadows, in particular, require close monitoring and analysis. Implementing repair techniques, such as Posidonia plantations, is crucial to maintain the ecological integrity of these areas. Such initiatives will ensure that these natural beaches continue to provide their vital ecological functions while remaining unspoiled for future generations.

Applied Protocols and Regulatory Actions

The Protocols of Care and Repair are strategic care and protection recommendation designed to preserve and rejuvenate ecological and cultural assets within vulnerable coastal regions, particularly through understanding and adapting through processes by applying different methods of care according to the needs of the system. They focus on maintaining the health of natural ecosystems, such as beaches and marine habitats, and enhancing the resilience of these areas to climate change and human impact.

An example of these protocols in action is the careful management of beach nourishment projects that use sand and pebble deposits to counteract erosion, and management of Posidonia oceanica meadows and their discarded leaves. Unlike conventional methods that often disrupt marine life, the protocols dictate the use of materials and techniques that synchornise with the needs of natural processes and are less invasive. This includes the strategic placement of sediments to gradually build up beach profiles without harming the existing marine ecosystems.

Additionally, the Protocols of Care and Repair involve the restoration of native vegetation along coastal buffers. This includes planting native species that are adapted to local conditions and can thrive without intensive maintenance. These green belts act as natural barriers against storm surges and provide habitats for local wildlife, contributing to biodiversity conservation.

In urban areas, these protocols extend to the rehabilitation of public spaces to integrate them seamlessly with natural elements. This might involve converting paved areas back into permeable surfaces or redesigning urban waterfronts to include features that absorb rather than repel water, enhancing the area's ability to handle extreme weather events.

Regulatory and planning actions are essential to enforce the Protocols of Care and Repair and ensure the sustainable development of coastal areas. These actions include zoning regulations that limit construction in vulnerable coastal zones and promote the development of green infrastructure. For instance, building codes might be revised to require that new constructions incorporate energy-efficient designs and materials that reflect heat, reducing urban heat island effects.

Planning actions also involve the strategic retreat from areas most vulnerable to sea-level rise and erosion. This might mean relocating or demolishing structures that impede natural coastal processes and replacing them with public parks or wetlands that can serve as buffers against storms and flooding. Such measures not only protect the coastline but also provide recreational spaces for communities, enhancing quality of life and local economies.
Transportation planning is another critical aspect, particularly in reducing reliance on vehicles, which contributes to carbon emissions and traffic congestion. Implementing new public transit lines, creating pedestrian-only zones, and expanding cycling networks can help reduce the environmental impact of transportation while improving accessibility and mobility.

Overall, these regulatory and planning actions aim to create a framework within which communities can develop sustainably while respecting and enhancing the natural environments that define and support them. These efforts require collaboration across government levels, as well as engagement with local communities, businesses, and environmental groups to ensure that the needs and values of all stakeholders are considered.

Adapting to Uncertainty

Threads in Projected Scenarios

As previously discussed, the concept of using *threads* as a projective method was introduced. This approach becomes particularly powerful when combined with scenario planning, which provides forecasts of potential future conditions. By employing these scenarios, we can effectively frame and speculate on the future trajectories of these threads within a predefined set of circumstances. This method requires a robust base of information as outlined in the scenarios, ensuring that the conditions are well understood and that the poten- tial reactions from various perspectives are thoroughly considered.

For the purposes of this project, we will apply this method by overlaying a scenario onto an already harmonized system. This will be illustrated using the example and design strategies discussed in the previous chapter. By doing so, we engage in a form of speculative analysis that not only tests the resilience and adaptability of the current system under projected future conditions but also helps in anticipating potential challenges and opportunities. This approach allows us to see beyond immediate solutions and to strategize effecively for long-term sustainability and integration.

This speculative tracing of threads, informed by scenario planning, is crucial in understanding how different elements within a system can evolve over time in response to changing external and internal pressures. It enables planners and stakeholders to visualize potential shifts and to craft strategic interventions that are both adaptive and proactive. By preemptively addressing these future scenarios, we can ensure that the system remains robust, flexible, and aligned with broader goals of sustainable and harmonious development. This method not only enhances our capacity to manage change but also empowers us to shape it, creating more resilient and dynamic communities and systems.

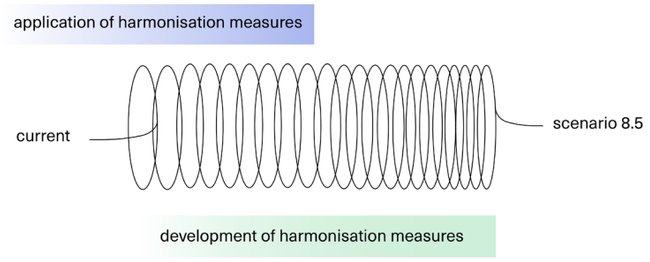
PERMUTATION

RCP 8.5 in the Croatian Adriatic

The Mediterranean region, identified by the IPCC as a climate change hotspot, is undergoing significant transformations, with scenarios indicating substantial temperature increases and altered precipitation patterns by 2100.

According to the AdriAdapt project, under the moderate emissions scenario (RCP4.5), there is an expected average air temperature rise of 2°C, which could reach as high as 4.5°C under the high emissions scenario (RCP8.5). Notably, the greatest temperature increases are projected during the summer months, significantly impacting local ecosystems and human activities, such as tourism. The distribution of both minimum and maximum temperatures will shift towards warmer values across all seasons, with marked reductions in cold days, particularly in winter. The number of cold days could decrease by up to 25 days by the end of the century under the RCP 8.5 scenario. Additionally, the region is expected to experience more intense and frequent heatwaves, especially in urban areas during summer, doubling the number of tropical nights compared to current figures. Rainfall patterns will also vary, with a general decrease in summer precipitation and an increase in extreme precipitation events in winter. This could lead to significant challenges in water management and agriculture, exacerbating issues related to droughts and flooding. Intense precipitation increases are expected particularly along the eastern side of the Adriatic and in Croatian inland areas, which could see up to 10 mm per day increase during extreme events.

The aforementioned harmonisation measures are designed to be flexible towards uncertainty and change, as they are ever adapting to find harmony both on a hyper-local as well as regional scales, and focus primarily on modifying the system processes.



Following visuals showcase the final outcome of the harmonisation developed to respond to the aforementioned conditions in a future scenario.

Harmonisation

Adapting to Uncertainty:

Njivice Harmonisation towards Scenario RCP 8.5

Upon initiating the harmonising transformative actions, the process of harmonisation continues and is cyclically updated with new inputs from the site. This approach can and should be combined with the scenario method, especially in terms of trying to create more flexible urban and peri-urban structures to respond to uncertainty. In terms of the predicted RCP Scenario for the change in local and global climate, our selected site would need to develop the harmonisation process to the following state:

Expropriation of land and retreat of built structures from the coastal edge needs to be completed for the first 100m of shoreline in all settlements of non-permanent residency. In settlements such as Njivice town, any secondary or ephemeral structures need to be removed to make space for resilient green zones, as well as expected sea level rise, especially during high tide and storm surges.

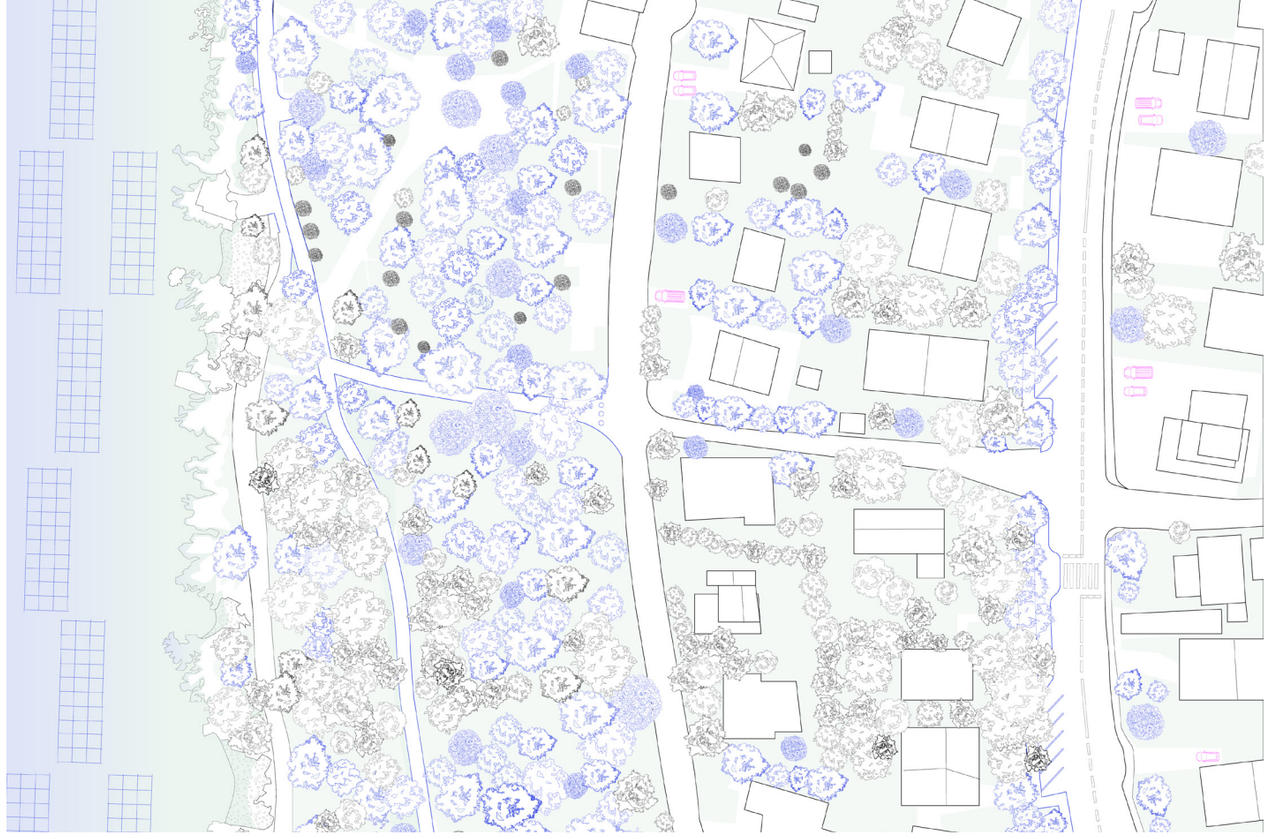
In the cleared out areas, green corridors are re-established, taking into account specific functions such fire retardancy, cooling abilities, drought and erosion resilience, as well as the ability to host social functions and provide a hospitable public space for locals and tourists alike.

Public transportation services need to be adequately upkept and updated to changing conditions (for example the inability to operate water-bound transportation, closing of bridge due to stronger winds etc.). Land and structure use changes done during the harmonisation stage should be updated according to the changing needs of the local population. Tourism of course still remains as an important element in both identity and space of Njivice, but its economic aspirations have to take a longue duree approach in how the new sectoral strategies are formed. Upkeeping the “attraction” by following along with mechanisms of harmonisation is not only a moral, but also rational imperative in the long term.

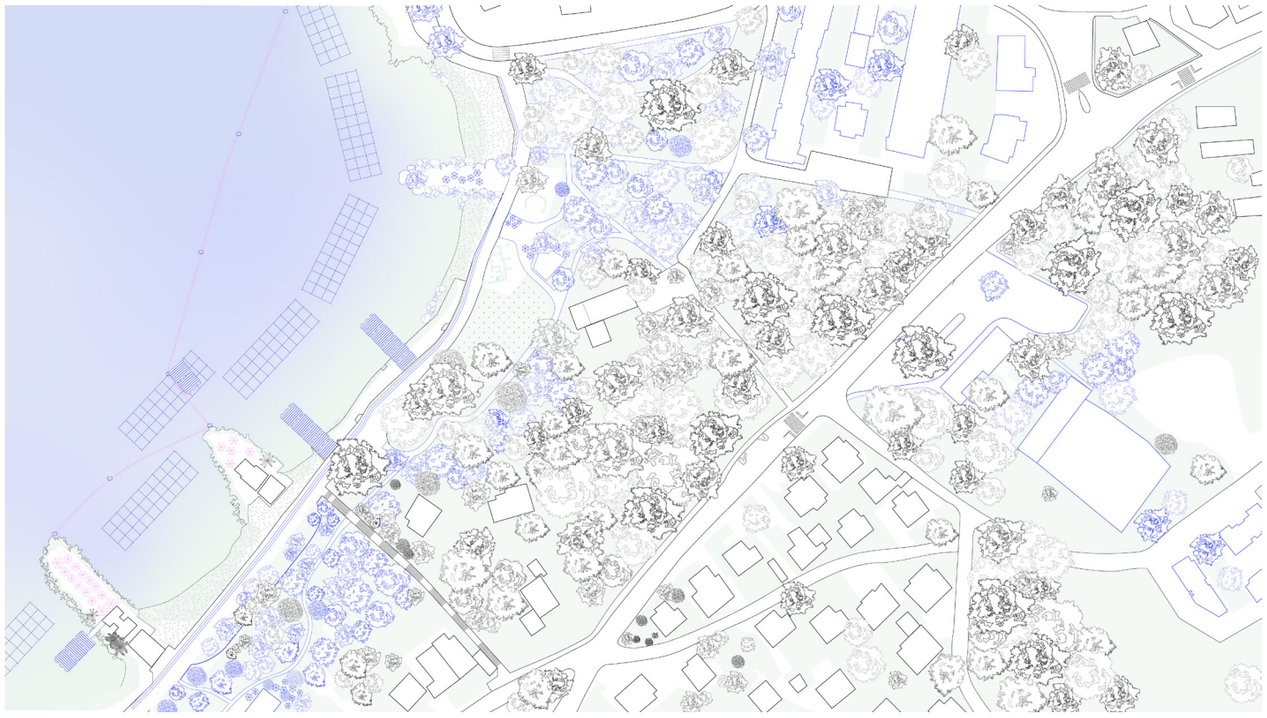
The following zoom-ins illustrate the final stages of harmonisation towards the RCP 8.5 Scenario

Harmonisation

Pier + Town

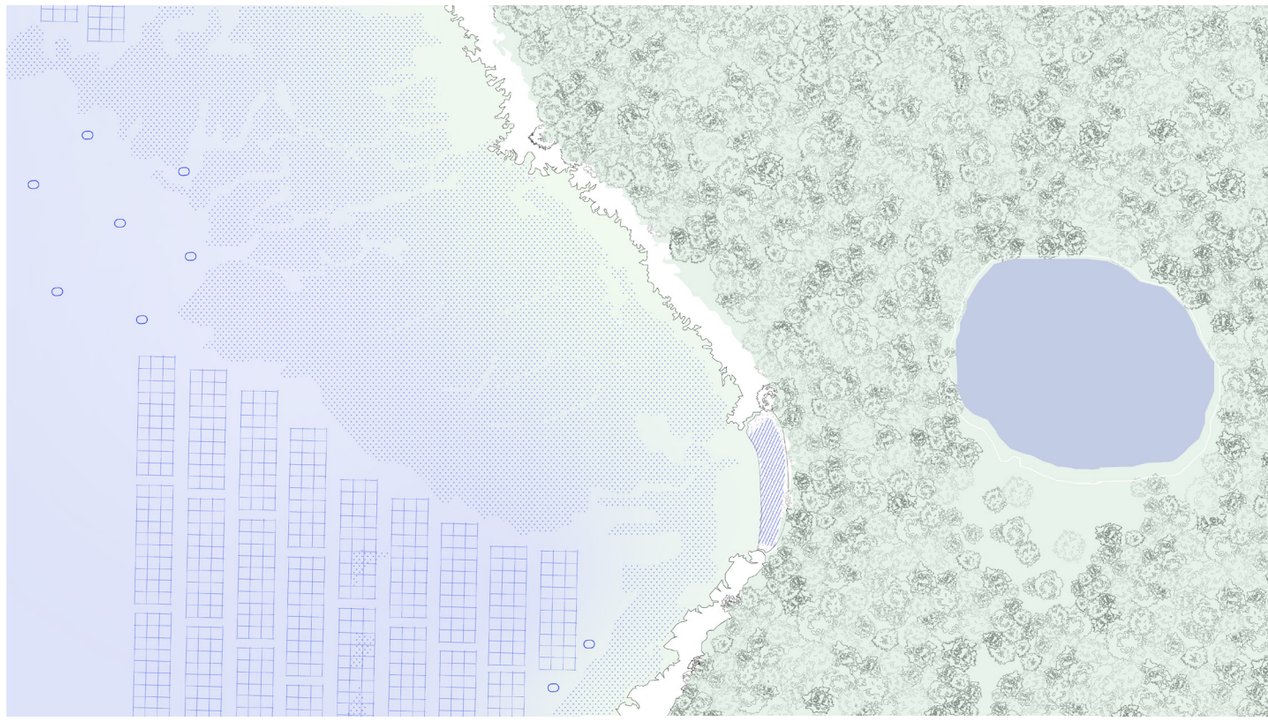


Promenade + Vacation House Settlement



Town Beach + Edge

100 m



Natural Beach + Shrubland Forest

100 m

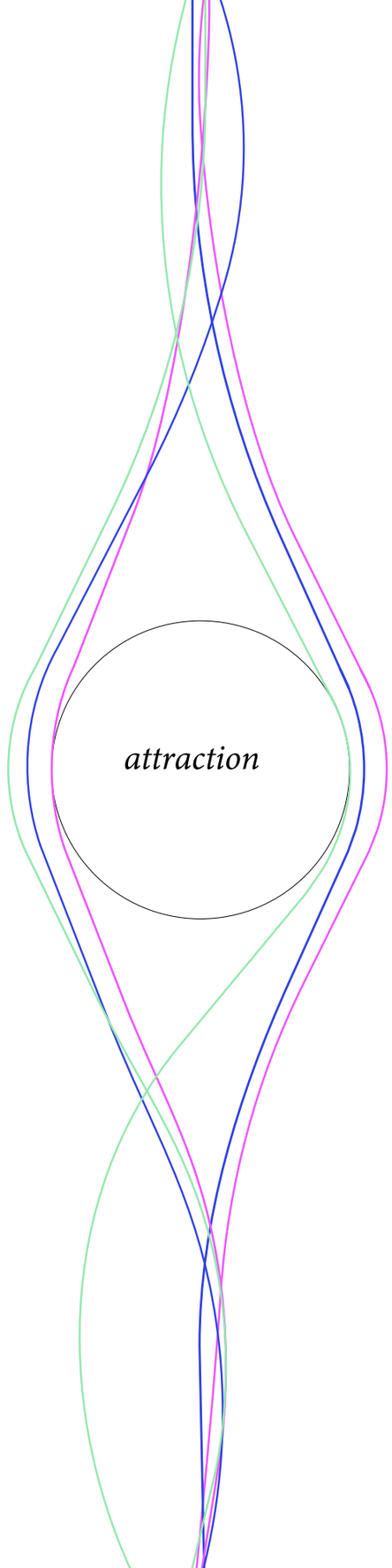
III.3 Resolution

flipping a melody or chord upside down, so the notes that were high become low and vice versa (Griffiths, 2005).

Resolution

In the previous section an inversion of the understanding and transforming spatio-temporal conditions of coastal over-touristed areas through tracing spatio-temporal threads and harmonisation of elements was explored.
To conclude the projective part of this thesis, the following chapter showcases the way in which this project could be implemented, and provides a synthetised answer to the initial research question.

sympoiesis of the attraction



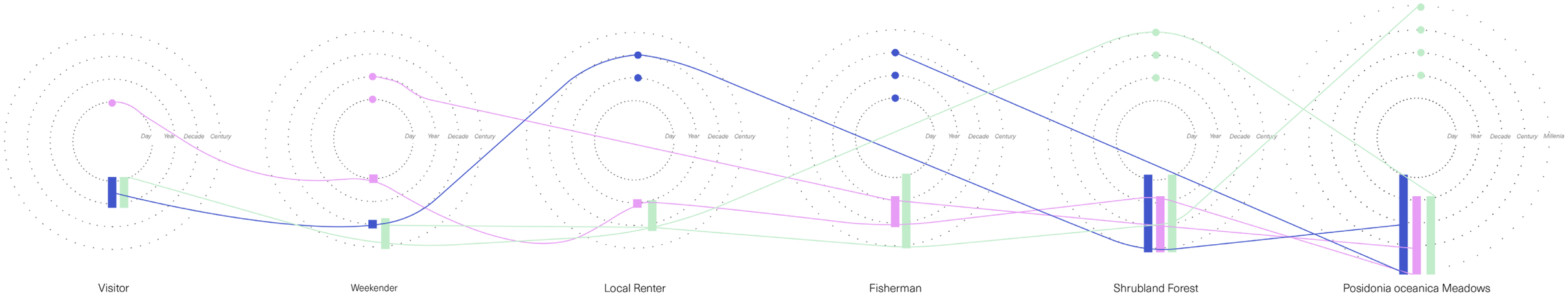
End of the Paradox

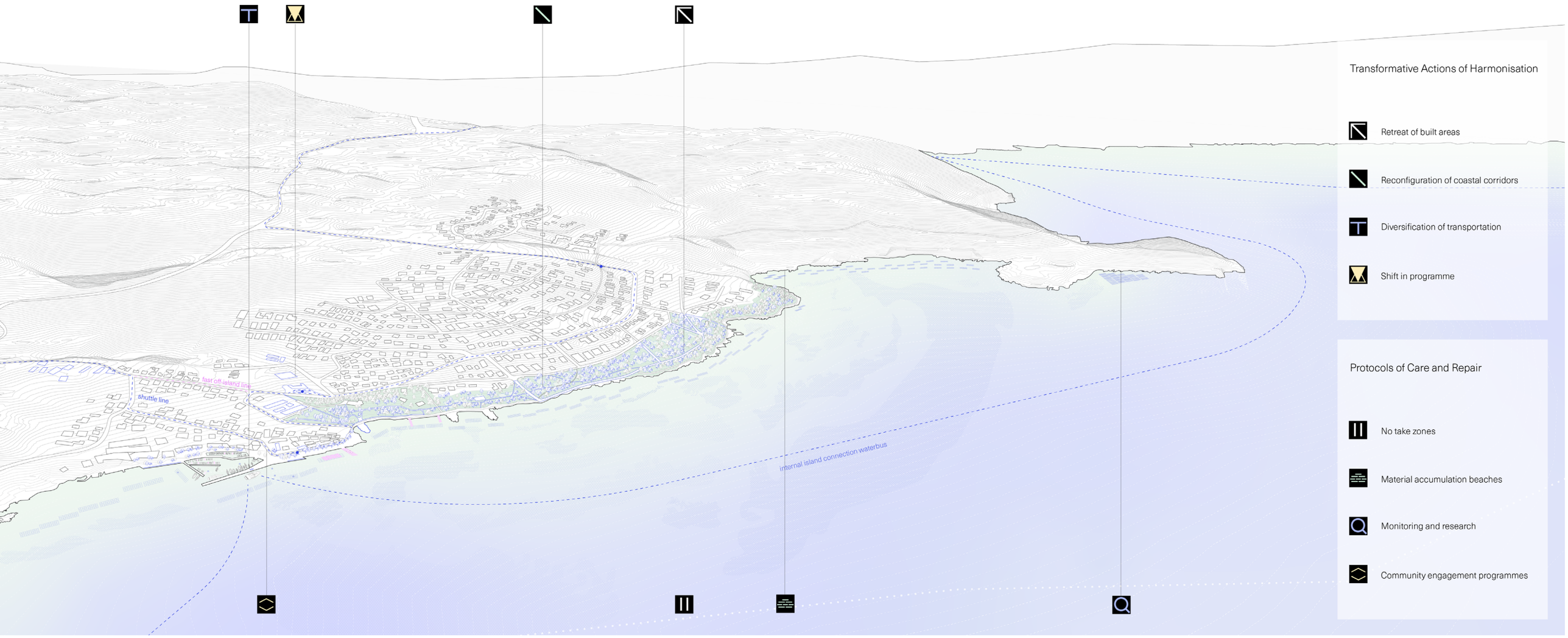
In the *Dissonance* chapter of this thesis, I have defined the three main elements through which tourism establishes itself spatially - transportation, accommodation and attraction. While all three are neccessary for the transformation of space into a tourist destination, attraction stands out as the main motivator and spatial organiser of these elements and the processes which happen around it. However, in motivating the development of these structures, it is also diminishing the very systems upon which it depends. This ‘Paradox of the Attraction’ explains why the current operational framework of overtourism on the Croatian Coast is not detremental to not only more-than-human and local human processes and interests, but ultimately also tourism itself.

In harmonising different spatio-temporal threads of the different systems, the main attraction of the Croatian Coast - the beach - was again observed as a special area of culmination of many actions and effects and given special attention. The final result of this approach is a ‘Sympoiesis of the Attraction’, in which working with the different systems instead of positioning them in a static hierarchy with no regard for time and effect, culminates in a attraction which is cared for and repaired precisely because of its attractive qualities.

The beach is recongised as a complete and vulnerable system of green, grey and blue ecological corridors, but also as a social space which brings prosperity, as well as physical and emotianal wellbeing to visitors and locals alike. This is not a linear or finite project, but rather a cyclical process of spatial care which confirms the agency of spatial reading, planning and design.

Resolution



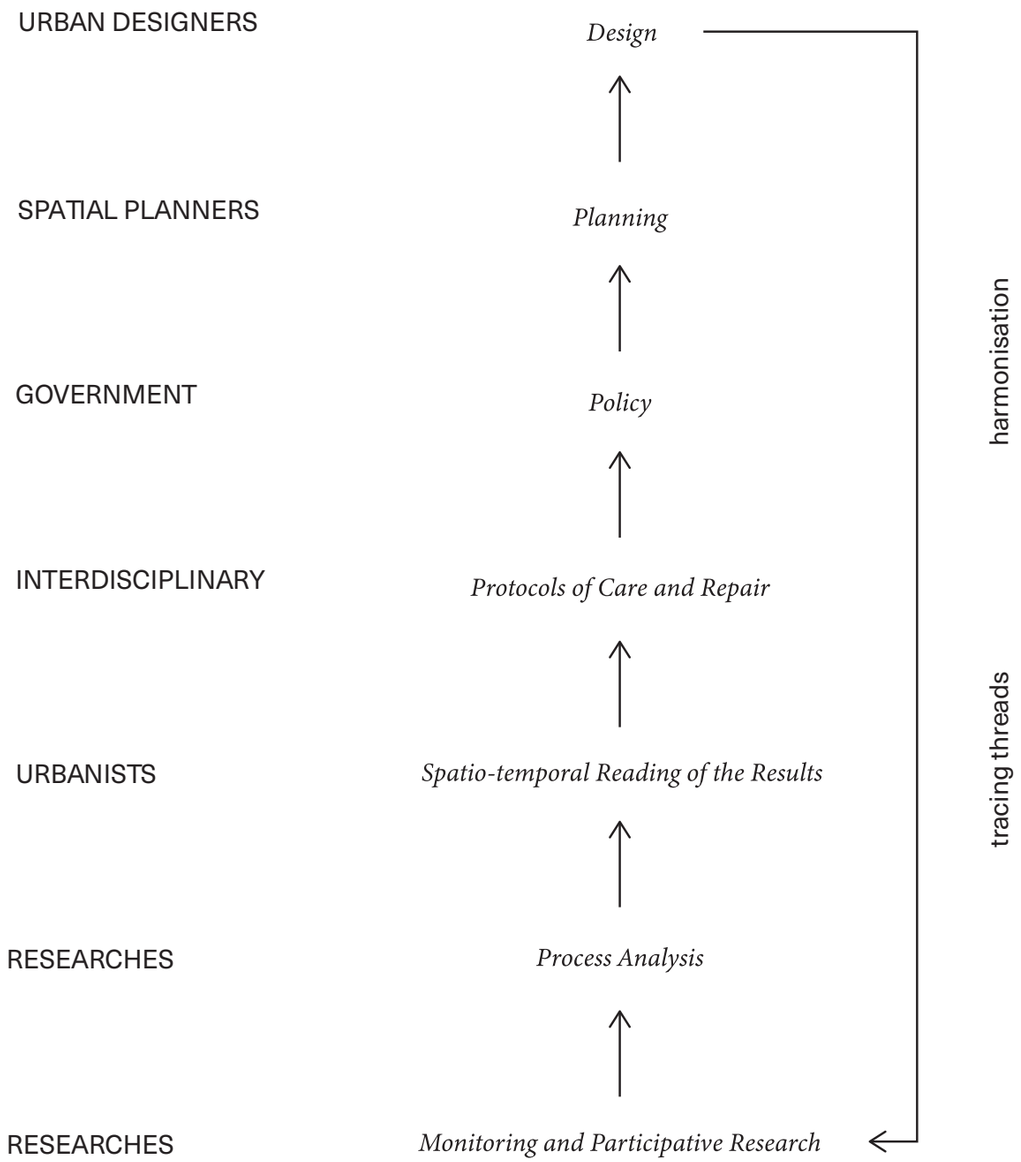


Transformative Actions of Harmonisation

- Retreat of built areas
- Reconfiguration of coastal corridors
- Diversification of transportation
- Shift in programme

Protocols of Care and Repair

- No take zones
- Material accumulation beaches
- Monitoring and research
- Community engagement programmes



Application Pathway Outline

Even though the ‘threads’ and harmonisation mechanisms, such as the Protocols of Care and Repair, exist primarily as speculative models for future operationalising of spatio-temporal analysis and transformation, it is worthwhile to reflect on the possibilities of their application.

Firstly, it is important to note that both the analytical and projective proposals rely heavily on the notion of interdisciplinary knowledge integration and implementation. Currently, policies, plans and design do lean towards interdisciplinarity, but as discussed in the *Threads* chapter, these efforts usually conclude with outsourced reports whose application depends on generic and quantifiable definitions which need to somehow be considered. Oftentimes, there is no obligation to actually integrate this information (as is the case with most participatory results), and even when there is (for example in the case of Environmental Studies), they usually concern specific metrics, which are not continuously (if ever) monitored and re-evaluated.

The scheme proposed by this project once again follows the same shift towards the understanding of cyclical time and the importance of stewardship, and integrates the methods, mechanisms and actions proposed by the project within a system of operations. The base of this repetitive cyclical project is the situated research field, which is studied and monitored by research scientits of different professions. Key findings are gathered and localised to be interpreted by urbanists via the ‘threads’ method, after which interdisciplinary teams come together to create the Protocols od Care and Repair, which give the crucial input for the following harmonisation steps.

This pathway is constantly repeating, and occurs over multiple scales. It weaves the threads of the different systems into the transformative actions of tommorow. In this way, once again the making-with replaces dishonest compromising.

Resolution

Conclusion

This thesis critically explored the transformative impacts of tourism on the Croatian coast, addressing a set of pressing sub-questions that investigate the region's identity beyond its touristic facade, the specific spatial elements shaped by tourism, and the resultant socio-economic and ecological dissonances. Employing a "threads" methodology, the research traced the complex, multifaceted dynamic processes across different systems and timescales, shedding light on the interactions between more-than-human, human, and tourist perspectives.

The inquiry began by identifying the inherent biophysical characteristics of the Croatian Coast and assessing how human influences have reshaped these elements. This foundational understanding allowed for a deeper exploration of how tourism, as a socio-economic phenomenon, has redefined the semantics of the material plane, leading to a recalibration of tourism-related spatial structures and dynamics. Critical cartography and spatial identification disclosed how tourism has not only transformed but often exploited the Croatian coast, creating a dissonance between the region's ecological needs and economic ambitions.

Moreover, the study proposed a paradigm shift towards place stewardship and deeper engagement with the coast's complex identity through experimental design and planning projects. These initiatives aim to reconfigure the main spatial elements within the proposed paradigm shift, aiming for a harmonisation of systems that consider both current and future needs.
The harmonisation approach seeks to "untangle" critical inter-system relations, recognizing that perfect harmony is unattainable. This ongoing effort involves continuously reading spatio-temporal elements and their relations to create more harmonious spaces and preempt potential dissonances. The thesis positions itself to question the logic of approaching complex spatial processes, emphasizing that while defining spatial elements and structures is essential, planning and designing solely based on these definitions can overlook the genesis of dissonances.

Ultimately, the thesis not only answered the main research question by detailing the processes by which tourism-driven spatial transformations engender system breakdowns but also outlined strategies for their resolution. Through the development of Care and Repair protocols, regulative actions, and spatial transformations, the project sets a framework for operationalizing these insights, ensuring that both planning and policy interventions are informed by a comprehensive understanding of the coastal system's temporal and spatial dynamics. This approach addresses immediate dissonances and provides a sustainable pathway for future developments, ensuring the long-term viability and resilience of the Croatian coast.

IV. CODA

concluding section of a musical composition (Kennedy, 2006)

Relevance

Social Relevance

This thesis directly confronts the repercussions of unchecked tourist developments on the social fabric of coastal towns, underscoring the need for more nuanced and context-sensitive urban planning. It proposes a methodological shift towards viewing tourism impacts through a socio-ecological lens, emphasizing the importance of maintaining cultural and social integrity amidst economic pressures. This research encourages the creation of urban environments that respect local traditions and community needs, fostering social cohesion and enhancing the quality of life for residents. Such an approach not only mitigates the negative effects of tourism but also supports the development of resilient communities that can thrive in harmony with their natural and cultural landscapes.

Scientific Relevance

The thesis advances urbanism by developing the “threads” methodology, which rigorously maps complex interactions within urban systems through interdisciplinary knowledge integration. This approach challenges conventional urban planning paradigms by embedding ecological, social, and economic dimensions into a coherent analysis and design framework. Key to this methodology is the implementation of Harmonisation mechanisms like Protocols of Care and Repair, which guide urban transformation processes through continuous, cyclic refinements based on real-time data and interdisciplinary feedback.

The proposed application pathways for these mechanisms advocate for a dynamic, iterative process of urban planning. This process involves ongoing situational analyses performed by diverse research teams, whose findings inform urban planning through the ‘threads’ method. This methodologically rich approach facilitates the crafting of detailed, responsive urban strategies that adapt over time, ensuring relevance and efficacy. By operationalizing these insights through iterative cycles of planning, regulation, and design, the thesis positions urbanism to more effectively manage complex urban environments, fostering resilient urban spaces that are finely attuned to their social and ecological contexts. This systematic, cyclical approach promises to transform how urban spaces are conceptualized and managed, prioritizing a deeper, ongoing engagement with urban dynamics.

Reflection

What is the relation between the graduation project topic, the Urbanism master track, and the master programme?

The graduation thesis looks at the effect tourism has on the coastal region of Croatia, exploring the sense of spatial dissonance and imposed vulnerability, evident in both bio-physical and socio-economic perspectives. Tourism in itself is a complex phenomena to unpack as it exists in a very complex relationship between the space within which it occurs, and the society within which it is operating. Understanding how to identify and harness certain causalities inherent to tourism or its spatial elements is something I managed to do due to skills gained in the previous studios of the Urbanism Master Track.

Clearly identifying spatio-temporal elements and positioning them within a project is something which I particularly relate to the brief of the Research and Design Studio during Q1. Furthermore, the ability to upscale them on a regional level and identify key governance methods and policies was one of the key lessons of Spatial Strategies for the Global Metropolis Studio of Q3. Also, the value system chosen for the project corresponds to the general approach of this master track, recognizing that the need to perserve and repair bio-physical systems is one of the key elements of spatial justice and a precursor for any conversations about sustainability and resilience.

However, the thesis is naturally most directly influenced by the critical perspective inherent to the Transitional Territories Studio. From the ontological examination of complex processes, to the development of an analytical and projective methodology, the project owes much to the approach of the studio. The topic of this cycle in the Studio is Altered Nature which aligns with the position of the thesis.

How did your research influence your design/recommendations and how did the design/ recommendations influence your research?

The issue of pressures that overtourism is having on both environmental and socio-economic systems in Croatia is an urgent and critical issue which is not discussed enough past the general observation that the current condition is problematic. Due to the monocultural nature of tourism in the economic sense, it becomes a very delicate issue of how to argue many of the decisions which are neccesary if we want things to change. In this regard, the value of this thesis has its limitations.

While the objective of the thesis is to clearly argue that Croatia is stuck in a positive feedback loop in which tourism tries to modify the environment to 'make it better' while continuosly making it worse. While this might be unfortunate for the tourism industry it is absolutely catastrofic in terms of the state of the environment, quality of life and everything that comes in between. Essentially, the societal value is the potential of the project to elaborate this paradox and argue why taking a temporary economic 'hit' is the only thing which can ultimately protect the region from decline, or worse.

However, while the thesis refers to other types of production which would benefit from the reduction of touristic activities, it does not delve into alternative economic models which would be able to replace the financial gains coming from tourism.

The scientific relevance of the project is its interdisiciplinary approach, strenghtened by the proposed method of threads which aim to combine and integrate specialised knowledge with strategic planning and urban design. Of course, due to the all-encompasing nature of the project, certain scientific inputs have been simplified as is appropriate for an Urbanism master thesis.

How do you assess the value of the transferability of your project results?

Transferability of the project results was one of the main motivations of the project. As urbanists in Croatia have almost assumed the role of moderators between investors in tourism and environmentalists, and have reduced agency in the matter, one of the key motivations for this thesis is the potential of its application. The approach was modeled after so-called foundational documents which are often used in the process of assembling the national documents on spatial planning and development.

In this sense, the analytical and projective methods of partiture and threads, as well as the identification and reconfiguration of touristic spatial elements that are the key concepts which might be further explored and applied. Particularly touristic spatial elements provide an easy elaboration on why and how understanding the interrelationship between transportation, accommodation and attraction provides one with sufficient tools to intervene in the spatial effects of tourism.

In terms of the project results themselves, there are only a few which recommend radical steps which would be difficult to argue in the conteporary context, particularly the recommendation about the retreat of the built area, however even these are corroborated by existing policy recommendation on EU level, and most likely will soon become common practice.

If you could continue with this project, how would you develop it and with what purpose?

A potential future development for the project could involve tailoring it to diverse audiences. The core vision of the project requires the active engagement of various stakeholders to ensure both its creation and participation are successful. Although the fundamental message and recommendations of the project are straightforward and intuitive, they might currently be presented in a manner that is not easily understood by all potential users. Enhancing clarity and accessibility could greatly increase its impact.

Another prospective direction could involve developing tailored strategies that align with different sets of values or priorities. This approach would allow for the implementation of at least some project components, adapting flexibly to the specific needs and circumstances of different user groups.

The overarching goal of continuing to develop this project would be to stimulate further discourse and generate additional proposals aimed at addressing the central issues it tackles. This ongoing effort would help to refine the project's strategies and expand its reach, ultimately contributing to more effective solutions.

How has the process of writing this thesis influenced your own perception of the subject?

Even though I was aware from the outset that I occupied several stakeholder positions regarding this project, I did not anticipate how deeply it would affect me emotionally.

Throughout the thesis writing process, a beach in front of my family home—a place where generations of my family learned to swim and created significant memories—was partially destroyed to make room for an expanded path above. It was intriguing to observe how, despite my emotional response to this change, I consistently employed argumentation and rationale that stemmed from the research I conducted for the project.

During my fieldwork, even when visiting locations that were familiar to me, I experienced a renewed sense of appreciation and a responsibility of care that I had not felt before. This personal connection and response to the spaces in question profoundly influenced the trajectory of my thesis. They heightened my awareness of the importance of personal positioning, values, memories, and relationships we maintain with our surroundings. These insights enriched my perspective and ultimately shaped the conclusions and arguments presented in my thesis.

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