



| Mapping Interspecies Justice:  
Gaiagraphy of Patara



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**Mapping Interspecies Justice:**  
Gaiagraphy of Patara

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# Table of Contents

	List of Figures	VI			
	List of Graphs	VI			
	List of Drawings	VII			
	Abstract	VIII			
	Astratto	IX			
<b>Chapter 1.</b>	<b>Introduction</b>	<b>11</b>	<b>Chapter 4.</b>	<b>Gaiagraphy as a Critical Voice</b>	<b>63</b>
	1.1. Problem Setting	12		4.1. Why a Gaiagraphy of Patara?	64
	1.2. Purpose and Aims	28		4.2. Translating Analysis into Cartographic Language	66
	1.3. Research Questions	28		4.3. The Gaiagraphy Maps	68
	1.4. Expected Outcomes	29	<b>Chapter 5.</b>	<b>Reflections &amp; Discussions</b>	<b>77</b>
	1.5. Focus	29		5.1. Reflections	78
	1.6. Delimitations	30		5.2. Discussions	79
	1.7. Method and Process	30	<b>Chapter 6.</b>	<b>Acknowledgements</b>	<b>83</b>
<b>Chapter 2.</b>	<b>Theoretical Framework</b>	<b>33</b>	<b>Chapter 7.</b>	<b>Bibliography</b>	<b>84</b>
	2.1. Interspecies Injustice	34			
	2.2. More-than-human Design	35			
	2.3. Representational Turn	37			
	2.4. Methodological Position: <i>Gaiagraphy</i>	39			
<b>Chapter 3.</b>	<b>Context Analysis - Patara Beach</b>	<b>45</b>			
	3.1. Regional and Coastal Context of Patara Beach	46			
	3.2. Marine and Coastal Systems of Patara Beach	46			
	3.3. Interspecies Conflict Zones at Patara Beach	49			
	3.4. <i>Caretta caretta</i> as a Spatial and Temporal Actor	49			
	3.5. The Limits of Conventional Mapping and the Need for Gaiagraphy	60			

# List of Figures

- Fig. 1.1 Patara Beach
- Fig. 1.2 Location of Patara
- Fig. 1.3 Patara Special Environmental Protection Area 1/25.000 Scale Zoning Plan
- Fig. 1.4 Summer Houses
- Fig. 1.5 Patara Archaeological Site
- Fig. 1.6 Bird's Eye View of the Archaeological Site
- Fig. 1.7 Patara Dunes
- Fig. 1.8 Patara Dunes
- Fig. 1.9 Patara Dunes
- Fig. 1.10 Horse Riding
- Fig. 1.11 Dunes
- Fig. 1.12 Sand Lily
- Fig. 1.13 Caretta caretta
- Fig. 1.14 Temporary Vendors During the High Seasons
- Fig. 1.15 Turtle Nesting at Patara Beach
- Fig. 1.16 Human Activities in Vulnerable Coastline Zones
- Fig. 1.17 News Article
- Fig. 1.18 News Article
- Fig. 1.19 News Article
- Fig. 1.20 News Article
- Fig 2.1 Patara Beach
- Fig. 3.1 Dunes at Patara Beach
- Fig 4.1 Dunes at Patara Beach
- Fig 5.1 Dunes at Patara Beach
- Fig 6.1 Dunes at Patara Beach

# List of Drawings

- Drng. 1.1 Geological Evolution of Patara
- Drng. 1.2 Geological Evolution of Patara
- Drng. 1.3 Geological Evolution of Patara
- Drng. 1.4 Methodological Diagram
- Drng. 2.1 Gaiagraphy Principles
- Drng. 2.2 Gaiagraphy Principles
- Drng. 2.3 Gaiagraphy Principles
- Drng. 2.4 Gaiagraphy Principles
- Drng. 3.1 Territorial Landscape of Patara
- Drng. 3.2 Coastal Landscape of Patara
- Drng. 3.3 Marine and Coastal Ecosystem of Patara Beach
- Drng. 3.4 Interspecies Conflict Zones at Patara Beach
- Drng. 3.5 Caretta caretta as Spatial and Temporal Actor
- Drng. 3.6 Lifecycle of Marine Turtles
- Drng. 3.7 World map providing approximate representation of the loggerhead turtle's range
- Drng. 3.8 Migration routes of sea turtle populations
- Drng. 3.9 Marine Turtles in the Mediterranean
- Drng. 3.10 Gaiagraphy of Patara
- Drng. 4.1 Marine - Coastal Ecosystem as a Living Continuum
- Drng. 4.2 Caretta caretta Ecology and Temporal Rhythms
- Drng. 4.3 Spatial Conflicts as a Produced Condition
- Drng. 4.4 Gaiagraphy of Patara: A Situated Critical Zone

# List of Graphs

- Graph 3.1 Male proportions of hatching Caretta caretta at Dalyan Beach

## Abstract

This thesis investigates how cartographic representation forms interspecies justice in contested coastal landscapes under the dual crises of climate change and biodiversity loss. Focusing on Patara Beach in southwestern Turkey, it critiques anthropocentric mapping practices that stabilize dynamic ecologies into human-centered frameworks. By reframing the endangered loggerhead sea turtle (*Caretta caretta*) as a spatial and temporal actor, the thesis discloses how marine-coastal processes, tourism pressures, and ecological rhythms generate conflicts grounded in competing spatial reasonings.

Bringing about interspecies justice, more-than-human design, and Critical Zone thinking, the thesis develops Gaiagraphy as both method and outcome. Instead of illustrating findings, the Gaiagraphy of Patara functions as a critical cartographic voice that layers ecological data, sediment flows, and seasonal patterns to reposition non-human agency within spatial understanding. The study claims that interspecies justice begins at the level of representation, where mapping reshapes what becomes visible, valid, and actionable in landscape practices.

Keywords: *interspecies justice, gaiagraphy, cartographic representation, more-than-human design, anthropocentrism, coastal landscapes, Caretta caretta, spatial decision-making.*

## Astratto

Questa tesi indaga come la rappresentazione cartografica determini la giustizia interspecie in paesaggi costieri contesi, sotto la doppia crisi del cambiamento climatico e della perdita di biodiversità. Concentrandosi sulla spiaggia di Patara, nella Turchia sud-occidentale, critica le pratiche di mappatura antropocentriche che stabilizzano le ecologie dinamiche in quadri incentrati sull'uomo. Riformulando la tartaruga marina *Caretta caretta*, specie in via di estinzione, come attore spaziale e temporale, la tesi rivela come i processi marini-costieri, le pressioni turistiche e i ritmi ecologici generino conflitti basati su ragionamenti spaziali contrastanti.

Promuovendo la giustizia interspecie, il design più che umano e il pensiero della zona critica, la tesi sviluppa la Gaiagrafia sia come metodo che come risultato. Anziché illustrare i risultati, la Gaiagrafia di Patara funge da voce cartografica critica che sovrappone dati ecologici, flussi di sedimenti e modelli stagionali per riposizionare l'azione non umana all'interno della comprensione spaziale. Lo studio sostiene che la giustizia interspecie inizia a livello di rappresentazione, dove la mappatura rimodella ciò che diventa visibile, valido e attuabile nelle pratiche paesaggistiche.

Parole chiave: *giustizia interspecie, gaiagrafia, rappresentazione cartografica, progettazione più che umana, antropocentrismo, paesaggi costieri, Caretta caretta, processo decisionale spaziale.*



Fig. 1.1 Patara Beach ©Press release

## Introduction

This introductory chapter outlines the structure and purpose of the thesis while introducing its theoretical and methodological framework. The research tackles the double climate crisis and biodiversity loss, questioning anthropocentric approaches in architecture and landscape design. It delves into interspecies justice through more-than-human design and Gaiagraphy, testing how design can support and uncover coexistence among various species. Focusing on Patara Beach (Fig 1.1) as a case study to explore spatial conflicts between ecological and human systems.

## 1.1 Problem Setting

### Human-centered Design & Its Ecological Limits

The contemporary practice of architecture, landscape, and urban design heavily depends on anthropocentric focus. Design disciplines gradually evolved their purpose thanks to Enlightenment rationalism and the technical mindset to control, tame, and develop environments for humankind. This mindset is the main cause of city zoning, landscape programming, and the incorporation of smart technologies (Frichot, 2018). Humans have become both the subject and beneficiary of environments. However, this anthropocentric methodology has brought about important changes in functionality, infrastructure, and design is disclosing its critical weak points, which are climate and biodiversity crises in the Anthropocene (Latour, 2017).

The environmental issues of the Anthropocene need a further re-evaluation of the design strategies that have been part of these problems. In the debate of the built environment, what takes the most attention are extreme weather conditions, ecological collapse, and climate and planetary limitations (Morton, 2013). The consensus that design can only resolve such complex crises with technical skills is becoming less persuasive (Stengers 2010). Therefore, it is crucial to question the philosophical and ecological background of anthropocentric design. The view of humans as inde-

pendent, rational beings separate from the ecological system is one of the ideas that this mindset upholds (Braidotti, 2013). Thus, not only their technical impacts but also the arguments that they rely on need to be reconsidered.

Latour (2017; 2018) introduces a key critique of the modernist view. What he argues is that the ecological crisis brings out a fundamental philosophical break in modernity. In “Facing Gaia,” Latour discusses the division between nature and the mentality that allows modern societies to recognize Earth as a mere scenery of human activity. This conceptual split upheld handling landscapes and ecologies as programmable notions that humans can control.

In “Down to Earth,” Latour (2018) reexamines the ecological crisis not only as a failure of operating the

***Humans are no longer considered separate from the ecological systems; they are one with them.***

environment but also as a political and ontological issue as well. Humans are no longer considered separate from the ecological systems; they are one with them. This transition has direct implications for design. Unless the Earth serves as a neutral setting for human actions, we must reassess the basic knowledge that shapes design, including its assumed objectivity, ten-

dencies to generalize, and focus on control.

Criticism of human-centred design includes not only knowledge gaps but also ethical issues as well. In “The Posthuman” (2013), Rosi Braidotti introduces an ethics based on relationships and shared responsibilities. The idea of humans being independent and rational must shift to see them as deeply intertwined and shaped by complex ecological and technological systems. This methodology of design needs to begin from a perspective that considers the interconnected concerns of different species and systems.

In *Vibrant Matter* (2010), Jane Bennett points out this shift by highlighting the active role of matter itself. Bennett emphasizes vitalist philosophy to argue that non-human materials such as metals, seeds, and electrical currents hold a sort of vitality that affects outcomes.

Translating this into architecture and landscape design is to move away from considering materials and ecologies as mere tools and rather viewing them as active participants in the design process.

While anthropocentric design usually focuses on abstraction, standardization, and scalability, Stengers (2010; 2011) proposes cosmopolitical thinking. In the two volumes of *Cosmopolitics*, Stengers escapes from universal solutions and highlights local, diverse, and intentional processes that underlie specific con-

ditions and appreciate non-expert knowledge. This model is especially relevant in landscape and urban design, where standardized strategies often disregard the sophisticated ecologies.

Stengers encourages experts to slow down their train of thought, avoid exploiting ecology, and adopt practices of care, attention, and dialogue by cosmopolitical design, as indicated in her work. It focuses not on “What is the best solution?” but “Who or what needs to be involved before taking action?” This moves the practitioner’s role from master planner to coordinator of ongoing ecological and social developments.

***not on “What is the best solution?” but “Who or what needs to be involved before taking action?”***

These ideas converge into a philosophical and ethical critique of architectural and landscape design. Frichot (2018) indicates in *Creative Ecologies* that ecological practice needs more than just synthesizing environmental data or certain measures; it depends upon a structural rethink of what design is and does. Frichot argues about how architecture dominates ecological concerns without testing its anthropocentric roots. She emphasizes a provocative, diverse, and ecologically integrated approach that

nant values, authorship, and power structures.

This more-than-human approach requires new design methods that are collaborative and flexible and highlight the dynamics between interspecies. It includes designing with vital systems such as soil, water, plants, and animals rather than for them, appreciating their role in creating space. It also stands in need of calling on the ethics of maintenance, restoration, and care rather than prioritizing innovation and production. In the light of the climate crisis and ecological instability, the discipline must transcend human-centred standards. Resilience, biodiversity, and interspecies justice must be respected not only as benefits for humans but also as structural shifts in the purpose of design and whom it serves. Anthropocentric design that serves architecture and landscape fields is progressively insufficient in addressing ecological and global issues. Based on recent philosophical and ecological arguments, its assumptions about control, scale, and agency require a reassessment. The posthuman and more-than-human theories support a progressive path that redefines design as a practice rooted in ethics. The aim of this thesis is to reconceptualize design not as an imposition but as a practice of symbiosis, connection, and dynamics.

The Anthropocene, the current geological epoch, is known for what academicians and researchers refer

## Double Climate Crisis

to as “dual crisis”: the intertwined challenges of climate change and the decrease in biodiversity. This dead end goes beyond mere environmental issues, involving serious spatial implications that are reframing the position of life on Earth and reshaping the comprehension of architectural and landscape design. Despite being misinterpreted as separate phenomena, the climate crisis and biodiversity loss are sophisticatedly connected, deriving from the same anthropocentric paradigm that has dominated since the beginning of industrial modernity.

The dual crisis unfolds the vulnerability of the ecological system, not as a simple backdrop to human interventions, but as a responsive, dynamic, and progressively unsettled entity. The Earth as a political entity “Gaia” is reconceptualized by Latour (2017; 2018) to reveal that it responds to human activities in unpredictable ways, resisting governance through control, modeling, or neutralized management. The ecological system and biosphere are not isolated domains but elements of co-existing planetary network. Modifications to carbon cycles, atmospheric dynamics, and ocean currents simultaneously destabilize ecosystems, habitats and species resilience (IPCC, 2023; IPBES, 2019).

Modern development, based on the assumption of human exceptionalism, heightened this detachment. Urban spread, infrastructure expansion, and global

supply chains have successively disconnected human habitats from the ecological networks sustaining them. This disconnectedness fires up both greenhouse gas emissions and the loss of biodiversity. Haraway (2016) argues for “staying with the trouble” as an ethical and epistemological rejection, meaning interspecies methodologies exist within disrupted ecosystems. Correspondingly, Tsing (2015) indicates how life bears amidst the residue of capitalist expansion,

*“Staying with the trouble” as an ethical and epistemological rejection.*

where resilience is not simply a matter of technical adaptation but also a consequence of multispecies interdependence.

The reactions to the dual crisis have been conflicting in the design fields, nevertheless. Architecture, urbanism, and landscape design have progressively incorporated frameworks of climate resilience, carbon neutrality, and smart technologies. These actions often barely highlight emission reduction or urban infrastructure protection, accompanied by the more-than-human aspects of well-being. As Latour (2018) tackles these interventions, which sustain a problematic presumption that we can “engineer” a solution to planetary instability without re-examining the funda-

mental political and ecological claims that created it.

The Eastern Mediterranean, which is experiencing increasing pressures from climate change, land modification, and ecological fragmentation, is one of the most apparent examples of interconnectedness. Recently, mass tourism, unregulated coastal interventions, and boosted agricultural practices have reshaped the vulnerable landscape of the area. The Mediterranean is warming at a rate of 20% more than

the global average, accompanied by rising sea levels, extreme heat, and intensifying ecological stress (UNEP/MAP, 2020; Plan Bleu, 2020). Simultaneously, habitat loss and biodiversity decline continue unabated, indicating a systemic neglect of biodiversity among both policy and planning (Drius et al., 2019)

Patara Beach, situated in southwestern Turkey, illustrates a manifestation of the vaster spatial crisis. Located in a natural and archeological preservation zone, Patara provides an essential nesting habitat for the endangered loggerhead sea turtle (*Caretta caretta*), a species severely affected by environmental disruptions. Increasing sand temperatures, decreased moisture levels, and modified nesting patterns within climate change are disrupting the reproductive cycles of these specific turtles at present. Simultaneously, coastal erosion intensified by rising sea levels and shift to upstream river dynamics is rapidly altering

the physical characteristics of nesting environments (NOAA, 2024; (UNEP/MAP, 2020; Plan Bleu, 2020).

The increasing human activities, including seasonal tourism, vehicular damage, and the unregulated growth of service-related infrastructures, intersect with environmental challenges.

In addition to that, they pose model threats to the ecological and archeological integrity of the site. Regardless of the formal protections, regional governance at Patara remains essentially anthropocentric, accommodating access, development, and commodification of heritage over the principles of interspecies justice. Within this framework, the *Caretta caretta* serves as a symbol species, meaning its susceptibility emphasizes the underlying spatial and political dynamics that influence the design, usage, and controversy of landscape.

Instead of perceiving Patara simply as a natural spot requiring guarding from external threats, it should be grasped as a contested landscape, as a zone where the dual crisis is engraved at the local level, causing overlapping demands, agencies, and prospective futures. In this circumstance, ecological disruption is not merely an unfortunate outgrowth but instead a direct effect of spatial regimes that constantly prioritize mass tourism, human access, and temporal structures. This situation requires a restructuring of design

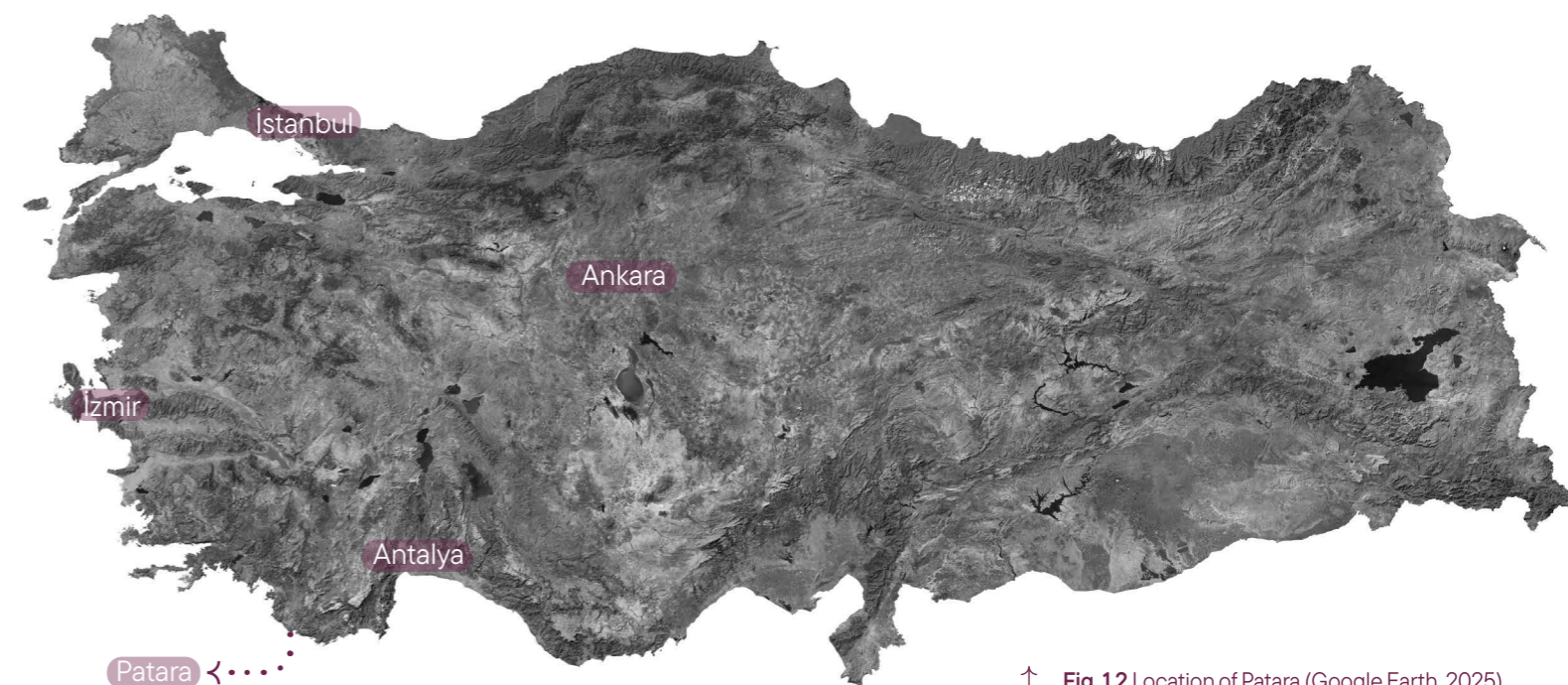
methods: not merely a mitigation of harmful impacts on the ecological systems, but also a fundamental re-

***Ecological disruption is not merely an unfortunate outgrowth but instead a direct effect of spatial regimes.***

configuration of the conceptual frameworks of spatial relationships.

By uplifting loggerhead sea turtles as a more-than-human asset within Patara, the site is rethought from a critical perspective through interspecies justice, ecological temporality, and spatial ethics. Patara oversteps the notion of a vulnerable beach; it demonstrates a dynamic region where architectural, ecological, and political bodies intersect. It serves as an indicator of the Anthropocene's dual crisis, embodied in sand, heat, and delicate seashells.

## Patara as a Contested Landscape



↑ Fig. 1.2 Location of Patara (Google Earth, 2025)

Patara (Fig. 1.2) is an important archeological site that is located in southwestern Turkey within a particular coastal landscape (Tanaka, 2018). It is a contested landscape that matters to ecology, archeology and tourism. The focus is upon interspecies injustice and more-than-human design in this master thesis. The site is a perfect spot since the loggerhead sea turtle habitats are important in Patara coastal zone (Erdoğan et al., 2001). Several sea turtle nests of this endangered species inhabit Patara Beach. Thus, the beach is famous for its conservation zones and first-degree archeological sites (Tanaka, 2018). Since the area is lucrative for mass tourism, it mainly acts as a tourist attraction by the force of the current government. Al-

though the conservation zones and restoration areas are still present, the management of this area's main goal is to attract as many local and foreign tourists as possible. The area's suspended masterplan makes that quite apparent. Mass tourism affects Patara's archeological areas and disrupts ecological balance (Council of Europe, 2012) therefore there is a need for a counter landscape representation to revisualize the site.

The masterplan prepared by the Turkish Ministry of Environment, Urbanization, and Climate Change in 2022 for the Patara Special Environmental Protection Area, located within the boundaries of Kaş, Antalya and Seydikemer, Muğla, was approved and suspended on June 5, 2023, following the evalua-

tion of objections. However, WWF-Turkey, the Antalya Chamber of Architects, and the Kaş Environment and Culture Association filed a lawsuit to cancel the plan, which is alleged to create new construction areas and increase the concrete-based development.

The Patara Special Environmental Protection Area covers an area of 364.37 square kilometers. The plan (Fig. 1.3), which aims to protect the natural, cultural, historical, and archaeological values as well as the ecological balance within the Patara Region, was found to be contradictory to its stated purpose of creating new construction areas for summer houses (Yavuz, 2024). In the lawsuit filed for its annulment, it was argued that “These masterplan changes are contrary to previous court decisions, it is far from protecting the natural and historical beauty of Kaş, leads to construction, will increase pressure on the site areas, and partially opens up olive groves to construction. Therefore, it is not in line with planning principles and legislation.”

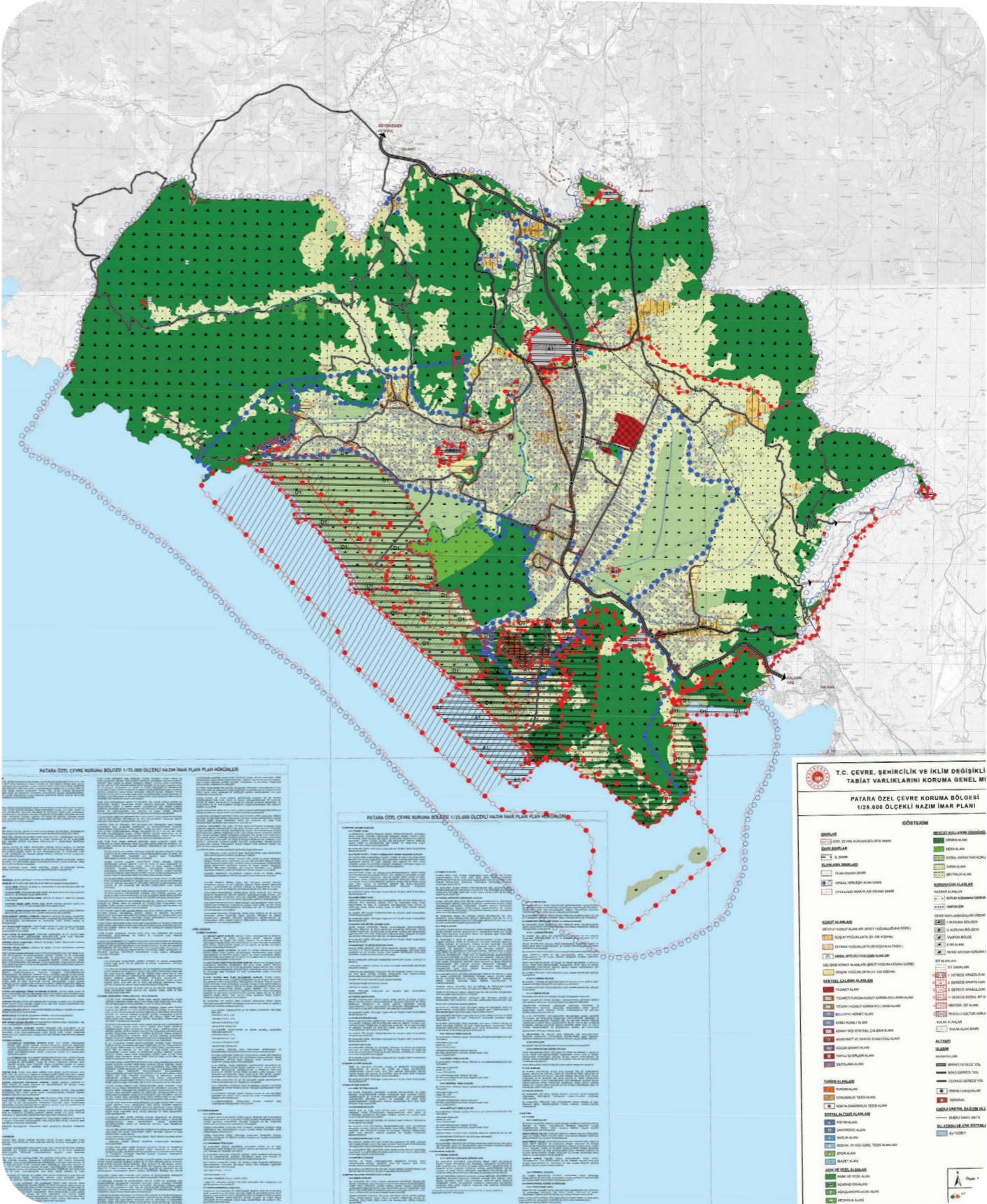
The area where cooperative buildings were constructed under the Management Plan implemented in Patara between 1993 and 2000 was declared a Third-Degree Archaeological Site, and construction was halted. In 2008, the Regional Council for the Protection of Cultural and Natural Assets decided to allow low-density construction within the site area. The plan (Figure 1.3) that was prepared paved the way for the construction of nearly 400 summer houses (Fig.1.4), in-

cluding the previously halted cooperatives. In this area, which is one of the necropolis areas of the ancient city of Patara, archaeological remains such as sarcophagi and olive oil presses were sacrificed to construction.

Following the building permit issued in 2008, it is evident that the summer houses are still under construction (Yavuz, 2024). This indicates that there is no valid public demand. Since most of the summer houses, which are not built for public benefit but for tourism, are under construction and not in use, there is no need for planning that enables a second wave of summer house construction.

Patara, which has three different protection statuses, is located within a Special Environmental Protection Area, a First-Degree Natural Site, and a Third-Degree Archaeological Site Area. In addition, it is subject to the law on the protection of olive groves. An area within the Patara Ancient City (Fig 1.5, 1.6), which has applied for inclusion in the UNESCO World Heritage List and has so many protection statuses, does not need the construction of summer residences that are not in public interest (Yavuz, 2024).

Just as the northern part of Patara was depleted by the cooperative’s passion, afforestation also took place in 1986, during the years when excavation permits were not granted, to prevent the sand dunes (Fig. 1.7, 1.8, 1.9) from advancing onto the land and the archaeological site. Those who ap-



↑ Fig. 1.3 Patara Special Environmental Protection Area 1/25.000 Scale Zoning Plan (2022)



↑ Fig. 1.4, 1.5

↓ Fig. 1.6



Summer houses, Patara archaeological site  
 ©Patara Kazı Arşivi  
 Bird's eye view of the archaeological site  
 ©Patara Kazı Arşivi

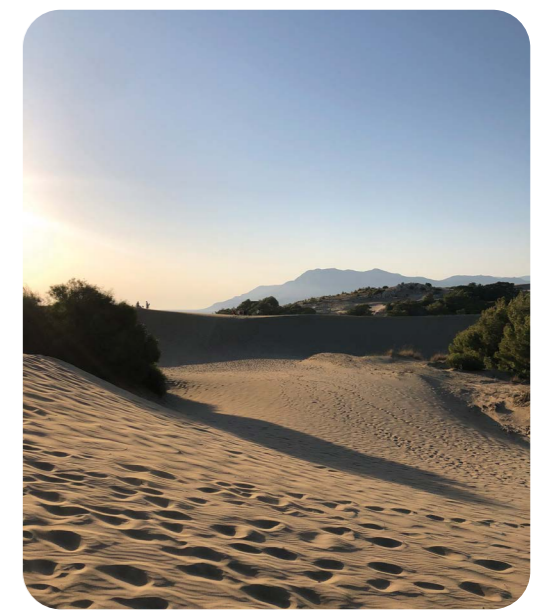


↑ Fig. 1.7

↓ Fig. 1.8, 1.9

Patara dunes ©Author

Patara dunes ©Author



proved the Forestry Directorate’s well-intentioned project failed to foresee the future consequences of disrupting the natural and historical balance, leaving nature vulnerable to other adverse effects.

The trees planted in the ancient bay basin severed the natural connection between the sea and the harbor, which was previously visible through the sand cover; the “forest” appearance of the bay began to reinforce the notion that this area had once been a “lake.” (Drg. 1.1, 1.2, 1.3) This is an extremely serious consequence that could fundamentally alter the topography of a city famous for being the main port of Lycia and defined by its historic harbor.

Afforestation may have achieved its goal of preventing sand from reaching the ancient city and forest; however, the price paid in terms of the damaged historical and natural fabric has been heavier. Nature is taking another revenge by piling sand at the afforestation boundary.

About 35 years ago, Patara Beach, once the largest in the northern Mediterranean, was transformed into a narrow corridor by the planting of trees; the sand that once drifted freely from the sea to the shore is now restrained by the trees (Fig. 1.11) and accumulates in front of them; artificial mounds stretching like a strip along the beach have begun to rise over time.

Patara Beach, along with the “sand dune” formed in the narrow area between the sea and the land, has already begun to lose its unique texture and natural

### The Disappearance of Non-human Habitats

The Patara case displays that the loss of multispecies habitats is inevitably attached to the decline of natural and historical landscapes. The spatial matters needed for the survival of sea turtle species like *Caretta caretta*, along with the dynamic ecological systems of dunes, coastal flora and fauna (Fig. 1.10, 1.11, 1.12, 1.13), are consistently discarded or shifted as human-made interventions diffuse into ecologically vulnerable zones. Habitat stability is precisely disrupted, and environmental resilience is depleted by mass touristic developments, which are regularly covered up by legal conservation rhetoric.

In Mediterranean coastal zones, such as Patara, tourism-led developments tend to take over complex ecosystems with more candid, anthropocentric settings. Drius et al. (2019) argues that infrastructure that detaches non-human beings from the conditions they depend on includes summer houses, roadways, and recreational facilities. Especially in Patara, this division is behavioral and architectural at the same time. The disruption of nesting zones is due to a number of causes, including vandalized warning signs for protecting the nesting zones, constant human intervention near turtle nests, the increase of temporary vendors during high tourist season, and excessive foot traffic caused by mass tourism (Fig. 1.14, 1.15, 1.16). Even though the Patara beach has a protection status,

appeal. The prohibition signs on the beach are insufficient to prevent sand dunes, located within the western boundary of the site and susceptible to fire, from becoming a dumping ground for visitors. Unless the Special Environmental Protection Agency takes urgent measures, the day when this beach becomes ordinary and all hopes for tourism are completely dashed is not far off. In addition to that, a short distance away from the Eşen Stream, the Koca Canal discharges agricultural chemical waste into the sea. Due to this irresponsibility, the sea turtles that have called this area home for thousands of years will soon be gone. (Işık, 2011)

Recent reportings of Fig. 17, 18, 19 and 20 illustrate how Patara’s archaeological and natural conservatory status do not prevent continual conflicts between conservation rules, tourism access, and everyday administration. News articles have documented sand extraction and associated bureaucratic procedures, night-access restrictions and fines formed to protect nesting periods, and public attention to nesting intensity at Patara as one of Turkey’s crucial *Caretta caretta* beaches. In company with these, local/national narratives around Patara’s identity and “ownership” also show how heritage and political symbolism converge with environmental governance in the area.



↑ **Drg. 1.1, 1.2, 1.3** Geological Evolution of Patara  
 Drawing by the author. Layers redrawn and reinterpreted from (Öner, 2001, 2009, 2013)

↓ **Figure 1.17** News Article  
(Cumhuriyet, 2022)

Translation: They stole sand from the world heritage site of Patara, were caught, and the confiscated sand was bought by auction.

Thousands of truckloads of sand were stolen from Patara, a district protected by special law. The case was brought to court. While the case was ongoing, the confiscated sand was sold illegally, far below its value. The buyer turned out to be the son-in-law of the company owner accused of sand theft.

## Dünya mirası Patara'dan kum çaldılar, yakalandılar, el konulan kumu ihaleyle aldılar

Özel kanunla korunan Patara'dan binlerce kamyon kum çalındı. Olay yargıya taşındı. Dava sürerken el konulan kumlar değerinin çok altında ve yasalara aykırı şekilde satıldı. Alan kişi, kum hırsızlığı ile suçlanan şirket sahibinin damadı çıktı.

30.07.2022 02:00:00 | Güncellenme: 30.07.2022 10:24:18 | Tuncay Mollaveisoğlu

AA + | A

↓ **Figure 1.18** News Article  
(Demirören Haber Ajansı, 2025)

Translation: The fine for entering these beaches at night is 557,212 TL (11.513.

Beaches like İztuzu, Patara, and Çıralı, where endangered sea turtles nest on the Mediterranean coast, have been banned from 8:00 PM to 8:00 AM. Fires and barbecues, tents, and vehicle access are also prohibited on these beaches, which will be accessible to sea turtles at night and to people during the day. Violators of these restrictions, which will remain in effect until the end of September, face an administrative fine of 557,212 TL.

## Bu sahillere gece girişin cezası 557 bin 212 TL

Nesli tehlike altındaki deniz kaplumbağalarının Akdeniz sahillerinde yuvalama yaptığı İztuzu, Patara, Çıralı gibi kumsallara, saat 20.00'den sabah 08.00'e kadar giriş yasağı başladı. Ateş ve mangal yakmak, çadır kurmak, araçla girişin de yasak olduğu bu kumsalları geceleri deniz kaplumbağaları, gündüz insanlar kullanabilecek. Eylül sonuna kadar sürecek yasakları ihlal edenlere uygulanacak idari para cezası ise 557 bin 212 TL.

↓ **Figure 1.19** News Article  
(CNN Türk, 2020)

Translation: Breaking news... Loggerhead nest record at Patara Beach

↓ **Figure 1.20** News Article  
(Cumhuriyet, 2024)

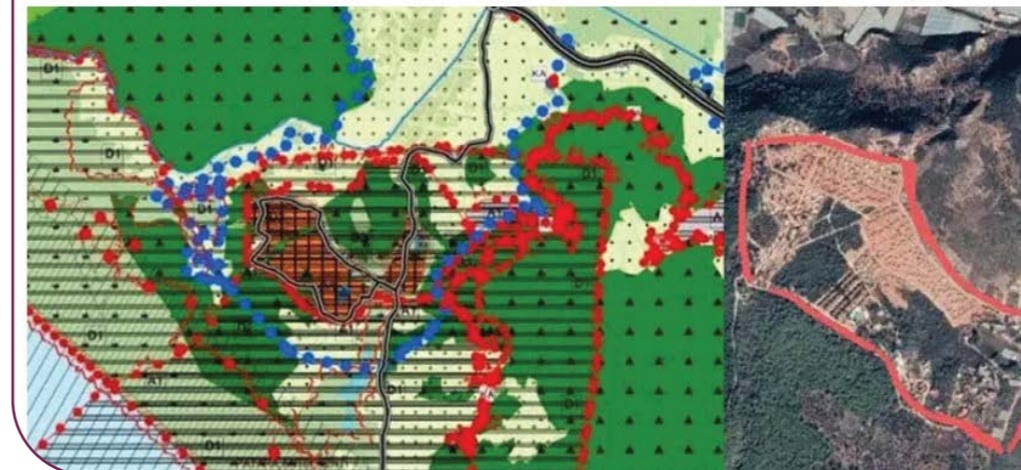
Translation: Today is Patara's Liberation Day.

Execution of the 1/25,000 scale master development plan for the Kaş Patara Special Environmental Protection Area has been suspended.

## Bugün Patara'nın kurtuluş günü

Kaş Patara Özel Çevre Koruma Bölgesi'ne ait 1/ 25000 ölçekli nazım imar planı yürütmesi durduruldu.

12.11.2024 17:08:00 | Güncellenme: 12.11.2024 17:08:19 | Ece Güneş



**Letti a parete intelligente per la casa moderna**

Letti pieghevole



↑ Fig. 1.10

Horse riding ©Author

↓ Fig. 1.11, 1.12, 1.13

Dunes ©Press release, sand lily ©Author, Caretta caretta ©Press release



↑ Fig. 1.14, 1.15



Temporary vendors during the high seasons, turtle nesting at Patara Beach ©Author  
Human activities in vulnerable coastal zones ©Author

↓ Fig. 1.16



these actions destabilize *Caretta caretta*'s reproductive cycles and threaten the fragile ecological balance.

On the one hand, the geomorphological processes are essential to preserve the beach itself; on the other hand, the life cycles of species are interfered by the breakdown of nesting beaches due to light pollution, noise, and temporary facilities (González Hernández et al., 2023). In this framework, ecological disruption is a fundamental aspect of design mindsets that sustain overlooking non-human spatial needs.

In conclusion, Patara is a profound ecological site of contestation where the mindset of development jeopardizes non-human entities and disturbs immemorial patterns of coexistence, as well as being a contested landscape in terms of archeology, history, tourism development, and coastal ecology. Considering the design of landscape is also the creation of futures for all, this thesis proclaims that any development for Patara's landscape must prioritize interspecies justice and spatial propositions that preserve and regenerate multispecies coexistence.

These intertwined crises require new representational and methodological approaches.

## 1.2 Purpose and Aims

This master thesis investigates how cartographic representations shape interspecies justice at Patara Beach, which is a valuable site with ecological, po-

litical, and archeological controversy on the Turkish Mediterranean coast. It critically explores how conventional mapping, urban planning, and landscape design practices boost human-centered perspectives, alienating non-human entities and concealing the multispecies complexities that shape the landscape.

The goals of the thesis are:

To expose the anthropocentric biases embedded in conventional maps, territorial plans, and masterplans of Patara.

To employ Gaiagraphy as a more-than-human representational method that centers ecological interdependence and multispecies existence.

To introduce an alternative spatial understanding of Patara that endorses interspecies justice and questions prevailing design paradigms.

## 1.3 Research Questions

→ In what ways can Gaiagraphy, as a more-than-human representational method, reveal multispecies and ecological relations?

→ How can shifts in spatial representation contribute to the advancement of interspecies justice in design and planning?

→ How do traditional cartographic and planning practices reinforce anthropocentric perspectives at Patara Beach?

The research questions present the conceptual foundation of this thesis, clarifying the theoretical orientation of the research and creating a path for investigation at the intersection of spatial representation and interspecies justice.

The work is structured around the following research questions:

These questions orient the thesis toward a critical questioning of landscape representation, highlighting the necessity for alternative spatial portrayals that center ecological cohabitation and more-than-human entities.

## 1.4 Expected Outcomes

The expected outcomes outline the concrete academic and imaginary outputs the thesis aims to produce, specifically in relation to more-than-human design and interspecies justice, positioning the research within a broader framework of interdisciplinary discussions on ecological and spatial controversies.

The thesis is expected to provide the following outcomes:

A critique of Patara's anthropocentric mapping practices, identifying how conventional representations conceal ecological interdependencies and marginalize multispecies dynamics.

→ A Gaiagraphy map of Patara, constructed through ecological, temporal, and multispecies data to reveal relations overlooked by traditional mapping.

→ A comparison between Gaiagraphy and conventional mapping, demonstrating how representational shifts can decentralize the human perspective and reframe landscape perception.

→ A methodological contribution to more-than-human design, showing how representation can operate as a tool for interspecies justice within landscape research.

→ These outcomes intend to advance critical cartographic thinking and assist the development of design practices that recognize and respond to the complex entanglements of human and non-human life.

## 1.5 Focus

The thesis focuses on the representational aspects of Patara's landscape, precisely exploring how interspecies and ecological relations are represented, alienated, or disclosed through cartographic practices. The research outlines interspecies justice as its core

ethical and conceptual problem setting, concentrating on Gaiagraphy as both a methodological and representational tool.

Instead of offering architectural design interventions, the scope is intentionally limited to theoretical analysis and cartographic examination. This focus of the thesis enables a further engagement with the politics of landscape representation, critically uncovering how mapping practices form our comprehension of more-than-human nets and the spatial requirements of coexistence.

This thesis is deliberately limited to the representational and cartographic analysis of Patara to maintain conceptual clearness and methodological focus. It does not propose architectural interventions and solutions or engineering-based conservation plans. Strategies such as habitat restoration, long-term conservation plans for *Caretta caretta*, or predictive ecological simulations are out of the scope of this research. Correspondingly, the study does not extend to a regional analysis of the greater Mediterranean coast, staying on geographically focused on the landscape of Patara. These delimitations allow that the thesis remain analytically grounded in the practice of mapping, more-than-human representation, and the theoretical entanglements of Gaiagraphy.

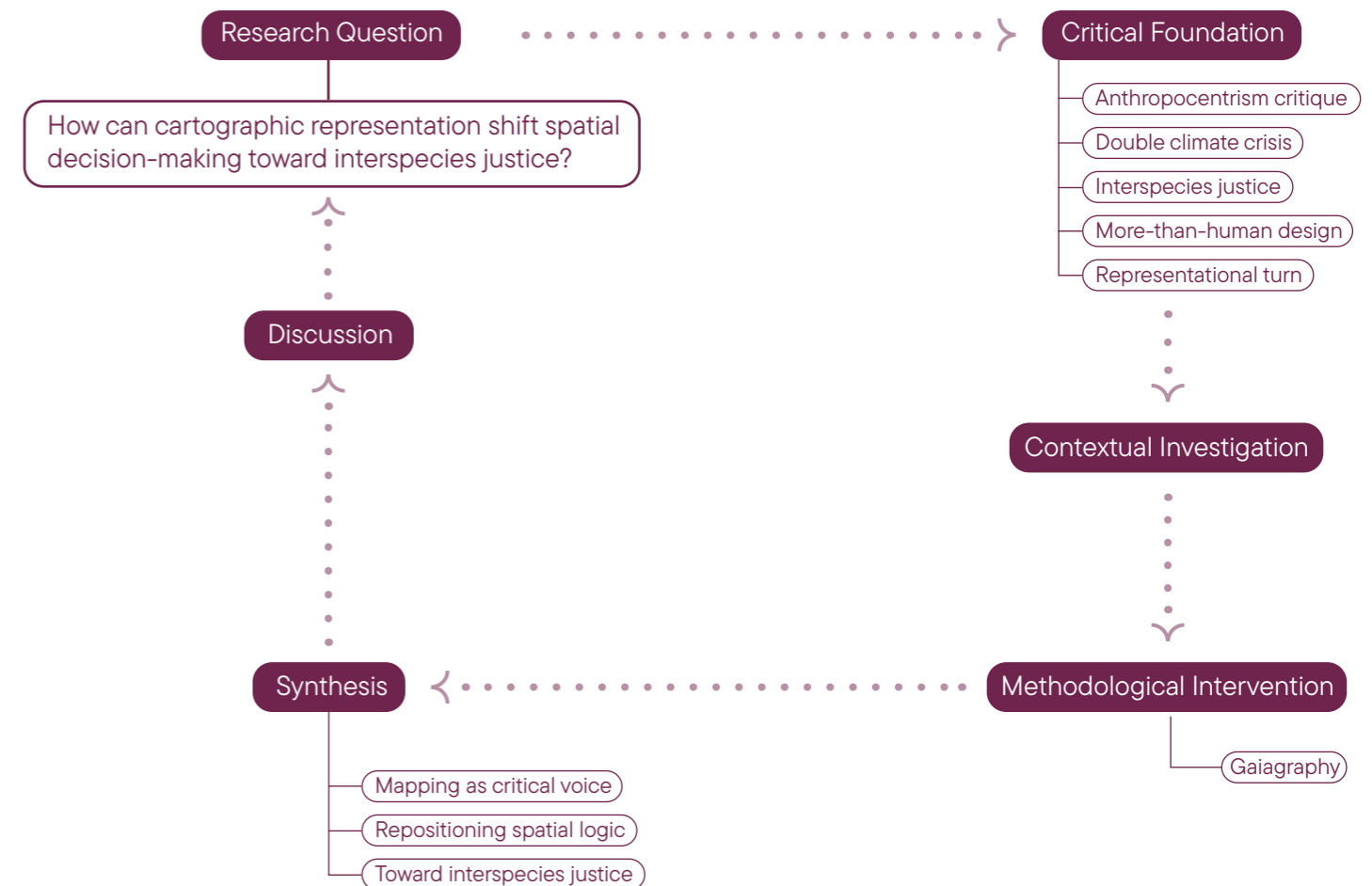
### 1.6 Delimitations

This study employs an interdisciplinary methodological framework based on interspecies justice, more-than-human design, and the representational method of Gaiagraphy. Interspecies justice serves as a moral lens through which non-human living beings and ecological processes are considered as actual spatial agents, questioning anthropocentric hierarchies in landscape representation. More-than-human design provides the methodological approach, leading the research into spatial relationships, ecological entanglements, and contested areas of coexistence between human and non-human actors. This way of thinking emphasizes the agency of species such as *Caretta caretta*, as well as geomorphological and climatic processes within the landscape dialogue.

### 1.7 Method & Process

Gaiagraphy serves as the main representational method, allowing the building of cartographic narratives that illustrate multispecies dynamics and reveal the constraints of traditional mapping. The research process includes integrating scientific datasets such as ecological, marine, geomorphological, and temporal information with analytical and dynamic mapping methods. Layers that are vegetation zones, nesting

habitats, sand migration patterns, touristic temporary structures, and protected archaeological zones are mapped to expose both spatial conflicts and ecological dependencies. These layers are next synthesized into a complete Gaiagraphy map that provides a more-than-human perspective of Patara. This method enables the thesis aim of rethinking landscape representation as a vital tool for interspecies justice while widening the role of cartography in architecture, urban, and landscape research.



## Theoretical Framework

This chapter builds the theoretical foundation of the thesis by assembling ethical, methodological, and representational perspectives that dispute anthropocentric spatial practices. It presents interspecies justice as the core ethical framework, acknowledging non-human beings as spatial and political agents, and encases more-than-human design as a methodological lens that repositions architecture and landscape practice as relational and mediatory. The chapter then discusses the cartographic and representational turn, critically tests conventional mapping, and introduces Gaiagraphy as an alternative, Critical Zone-based approach to spatial representation. Altogether, these perspectives shape the conceptual basis for remapping Patara Beach as a multispecies, contested landscape.



Fig. 2.1 Patara Beach ©Adobe Stock

## 2.1 Interspecies Justice

In the context of advancing the climate crisis and biodiversity loss, conventional understandings of justice grounded in anthropocentric legal and ethical models are progressively inadequate for focusing on the complexities of ecological damage and interdependent living systems. The more ethical concerns have been evolving from a narrowly human-centered environmentalism toward a greater and relational multispecies ethics, the more the notion of justice has gone through a crucial redirection. Interspecies justice appears from this deviation, offering a framework that recognizes non-human beings not as passive actors of human charity but as political and spatial agents whose interests, susceptibilities, and lived experience must be considered within both ethical and design practices.

*The lawful notion of the “subject” must be radically reformulated to include nonhuman agencies.*

The early discussions on environmental ethics during the 20th century oftentimes kept a utilitarian logic while still being foundational, treating nature as a mere source to be operated on or protected for human interests. On the contrary, multispecies ethics refers to relational doctrines that connect humans with animals, plants, microbes, and ecosystems, underlying coexistence over superiority. Donna Haraway (2016) and Thom van Dooren (2014) discuss the concept of human exceptionalism by emphasizing the intimate knots and co-dependencies

that form life on earth. What Haraway’s concept of “making kin” requires is a rethinking of responsibility and affiliation that goes beyond species boundaries, while Dooren’s study on extinction ethics points out the alertness to the lived experiences and cultural particularities of nonhuman species.

This ethical argument finds legal and political voice in the outbreak of the “rights of nature” and ecological justice movements that challenge the human-centered base of modern law and governance. As Anna Grear (2015) has argued, the lawful notion of the “subject” must be radically reformulated to include nonhuman agencies such as rivers, forests, and species to be rights-bearing subjects capable of

experiencing harm and deserving protection. Milestones of rightful recognitions, such as the granting of legal identity to the Whanganui River in New Zealand or the legal rights of nature in Ecuador, demonstrate a rising recognition of the demand for systemic constitutional transformation. These changes also illustrate serious implications for architecture and landscape practices where spatial interventions are repeatedly complicit in boosting human domination over ecological systems.

In this large moral-legal landscape, interspecies justice rethinks spatial and territorial questions by asking not merely who has access or possession, but who is acknowledged, protected, and could thrive. This is specifically applicable in architectural and landscape research, where design has historically served to control, separate, or eliminate non-human lives. As Latour’s work (2018) shows, the climate crisis is not simply about managing resources more efficiently; it is a political fracture that requires a reimagining of our place on Earth. Therefore, interspecies

*The climate crisis is not simply about managing resources more efficiently; it is a political fracture that requires a reimagining of our place on Earth.*

justice encourages spatial disciplines to employ ontological and epistemological issues of more-than-human worlds, asking for new design ethics grounded in coexistence, care, and ingrained responsibility.

Interspecies justice provides a critical lens through which to explore ecological, archaeological, and touristic stresses that characterize the area in the case of Patara Beach. In this context, the benefits of endangered species such as *Caretta caretta*, the stability of coastal ecologies, and the humanitarian urgencies

of tourism and development collide in material and representational disputes. Bringing about the more-than-human concept, this thesis introduces interspecies justice as a guiding theoretical framework to investigate how spatial disciplines, including mapping and planning, can either push down or uncover the presence and needs of nonhuman lives. By centering interspecies justice, the study aims to shift architectural and landscape reasoning toward a form of spatial ethics that is not only inclusive of nonhuman entities but also responsive to their mosaic futures.

## 2.2 More-than-human Design

More than human design appears from a critical action with post-humanist theory, which inherently questions the Enlightenment legacy of human exceptionalism in architecture and landscape. Embedded in the denial of the autonomous, rational subject as the primary agent of history and design, posthumanism repositions the human from the entitled position of genius over the world and readjusts them as one actor amongst many in an entanglement of interdependent relations. Braidotti (2013) discusses that

the posthuman circumstances demand an ethical and ontological shift away from individualism and anthropocentrism toward an understanding of assigned subjectivities created through webs of ecological, technological, and nonhuman beings. From the design perspective, this argument requires a re-examination of who or what engages in the creation of space and how agency is comprehended and mobilized.

Essentially, more-than-human design is the concept of distributed agency, where humans, non-humans, materials, infrastructures, and ecological processes co-create environments through mutual and dynamic interactions. Bennett's (2010) concept of *vibrant matter* demonstrates how non-human matters carry capacities to influence and be influenced by acting in the forming of spatial and ecological conditions. From this point of view, design is not a unilateral act dictated by human will but a settled negotiation among distinct agencies, regularly functioning across

***Design is not a unilateral act dictated by human will but a settled negotiation among distinct agencies.***

scales and temporalities. This questions the modernist concept of the designer as an authorial role and instead situates design practices as mediatory, which is

a process of enabling relationships between species, systems, and spaces.

This rethinking of agency remodels the position of architecture and landscape design. No longer outlined as instruments of control or aesthetic expression for humans, these practices become interfaces that are mediating between more-than-human agencies like seasonal migration, soil regeneration, sediment flows, or animal habitation. As Ingold (2000) explains in his "dwelling perspective," space is not an inactive capsule to be designed from above, but ongoing processes shaped through lived actions. Thus, design must shift from static object-making to relational, process-based practice that stays attentive to climate change, interspecies interactions, and site-specific conditions.

This methodological and epistemological change is exclusively relevant in contested landscapes such as Patara, where human, nonhuman, and environmental interests collide. In this context, territorial interventions cannot be reduced to problem-solving practices or technical optimization. Rather, they must fight the political and ethical complexities of multispecies coexistence, addressing questions of visibility, recognition, and spatial justice. Haraway (2016) defines this as "staying with the trouble," an alarm to stand with the complexities of interspe-

cies instead of searching for know-how or a proposal. More-than-human design therefore dismisses quick solutions or abstract planning, preferring established, responsive, and ethical ways of spatial engagement.

Furthermore, more-than-human design functions beyond built form. It involves representation methods such as alternative mappings, narrative tools, and speculative cartographies that render visible the often-invisible elements and refine the shaping of the landscape. As Frichot (2018) discusses, ecological design must transcend the solutionist methods and rather employ practices that are flexible and provocative. This larger scope enables more-than-human

***Ecological design must transcend the solutionist methods and rather employ practices that are flexible and provocative.***

design to challenge the prevailing representational strategies and epistemologies of design, broadening the possibilities of landscape visualization.

In summary, more-than-human design illustrates a critical shift from anthropocentric spatial paradigms. Guided by post-humanist theories, it decenters human agency and emphasizes the relational, processual, and multispecies aspects of space. Instead of proposing fixed solutions, it redefines design as an

act of mediation within a complex world of common vulnerabilities and co-created futures.

## 2.3 Representational Turn

The map has a long history of working as a foundational tool in architecture, landscape, and urbanism, providing abstraction, visualization, and control of spatial data. However, in the context of the climate crisis, conventional cartographical methods are being critically reassessed since they normalize anthropocentric assumptions, conceal multispecies entanglements, and diminish complex ecological processes into static spatial forms. The rise of the cartographic and representational turn shows an increasing recognition that maps are not inactive tools but are epistemologically and politically rich mediums that shape, instead of simply reflect, the worlds they argue to describe.

This shaping power serves not only through what maps illustrate but also through how spatial relations are technically constructed. Cartographic layouts such as orthographic and planimetric projections, Cartesian grids, and fixed coordinate systems set up a detached, aerial viewpoint that depicts territory as a stable, measurable surface available for human supervision. These representational choices favor

horizontal, stable, and visually controlled elements, while diminishing vertical depth, temporal variability, and ecological interdependence. Consequently, multispecies relations and environmental processes are flattened into abstract spatial zones, enabling humans as the absolute reference point and interpretive subject.

Standard mapping layouts such as orthographic projections, Cartesian grids, fixed coordinate systems, and isolated zoning typologies indirectly center the human as the base and measuring subject. These projections often entitle the aerial, distanced gaze, detaching land from its ecological dynamics and merging multispecies temporalities into a lone, human-oriented shell. As Latour (2018) and Stengers (2010) claim, such abstractions come from the modernist aspiration to know, manage, and control the environment as a passive background to human action. In the context of planning and design practices, the land use map, the zoning diagram, and the masterplan embody this mindset: they perform as tools of territorial fixing, often behind the façade of objectivity while eliminating lived, dynamic, and more-than-human dimensions of place.

This representational paradigm is especially problematic in the context of climate change and biodi-

versity loss, where landscapes are no longer stable organisms but changing assemblages formed by rising seas, migrations, and changing weather patterns. Coastal areas such as Patara Beach contain this instability. However, traditional maps remain inadequate to reflect such volatility and rather continue to show static photographs to weigh down temporal flows, ecological interdependencies, and the needs of non-human entities. Thus, the constraints of conventional cartography are not only technical but also conceptual and ethical: they conceal the contested and re-

***Standard mapping layout indirectly center the human as the base and measuring subject.***

lational disposition of landscape specifically at the moment when these qualities claim urgent attention.

In response to that, a trend of critical and speculative mapping practices has emerged, addressing the reimagination of representational instruments of spatial practices. Projects such as Feral Atlas (Tsing et al., 2020), Terra Forma (Carenzo et al., 2020), and Gaiagraphy refuse the neutrality of conventional cartography, instead experimenting with storytelling, ecological data, and alternative spatial understanding. Feral Atlas, for example, provides an interactive platform that maps anthropogenic disruption not

through defined categories, but through the activities of nonhuman entities such as fungi, pollutants, and weeds. Correspondingly, Terra Forma offers a series of “geo-poetic” maps that visualize processes such as erosions, extractions, and entropy, suggesting a more responsive and holistic approach to spatial representations.

While representations such as Feral Atlas and Terra Forma critically challenge human-centered mapping practices, they operate mainly as curatorial and speculative frameworks. Gaiagraphy was preferred for this thesis because it provides a site-specific, methodologically suitable approach rooted in Critical Zone thinking, enabling the integration of scientific data, ecological processes, and multispecies relations into a logical cartographic representation. That is the reason Gaiagraphy is especially appropriate to addressing interspecies justice within the contested coastal landscape of Patara, where spatial conflicts among conservation, tourism, and ecological resilience demand suitable representational practices.

This reconceptualization of mapping as a design act, rather than a descriptive one, is crucial. Maps do not merely reflect spatial realities; they take part in the production of space, legitimating certain visions while excluding others. Recognizing this, mapping becomes a moral intervention, a way of questioning what and who is made evident, what kinds of knowl-

edge are prioritized, and what forms of futures are set up. As Latour (2018) argues, in the era of the Anthropocene, landscape representation is no longer about projecting sovereignty over space but more about learning to place ourselves within delicate, contested, and co-created terrains.

Inside architectural and landscape research, the cartographic and representational turn demonstrates a shift not simply in method but in worldview. It aligns with greater post-humanist critiques by decentering the human and welcoming complexity, entanglement, and local perspectives. Consequently, it opens new views for more-than-human design and interspecies justice, offering tools to represent, adopt, and henceforth recompose landscapes as multispecies territories in flux.

## **2.4 Methodological Position: Gaiagraphy**

The alternative mapping representation, “Gaiagraphy,” as developed by Alexandra Arènes, Bruno Latour, and colleagues, is not merely a cartographic tool but a methodological repositioning of landscape representation within the Anthropocene. It answers to the representational challenges fostered by the climate crisis and biodiversity loss, specifically the necessity to foreground multispecies entanglements, vertical

and temporal processes, and the epistemological limits of traditional cartographic practices. In contrast to the conventional maps that prioritize human mobility, political boundaries, and abstract zoning, Gaiagraphy depicts the Earth's Critical Zone, which is the thin, fragile interface from canopy to bedrock where life and matter interact, as the focus area of spatial analysis (Arènes et al., 2018).

The principles of Gaiagraphy test static, top-down, and human-centered modes of representation. It is relational, accompanying ecological connections across species and scales; thick, stressing layered materialities and historical depth; temporal, blending dynamic rhythms and transformations; and speculative, withstanding closure and embracing ambiguity. These principles are not only theoretical, but they are also functional. They form how Gaiagraphy should be read (Drg. 2.1, 2.2, 2.3, 2.4): as a mapping practice that opposes simplification, foregrounds spatial negotiations across time and matter, and uncovers continuing ecological entanglements. Rather than presenting a singular, static vision of landscape, Gaiagraphy offers the reader to maneuver multispecies trajectories, invisible infrastructures, and conflict zones as overlapping and developing spatial conditions. Therefore, it claims a slower, more interpretive mode of engagement what Arènes et al. (2018) describes as "making the surface thick."

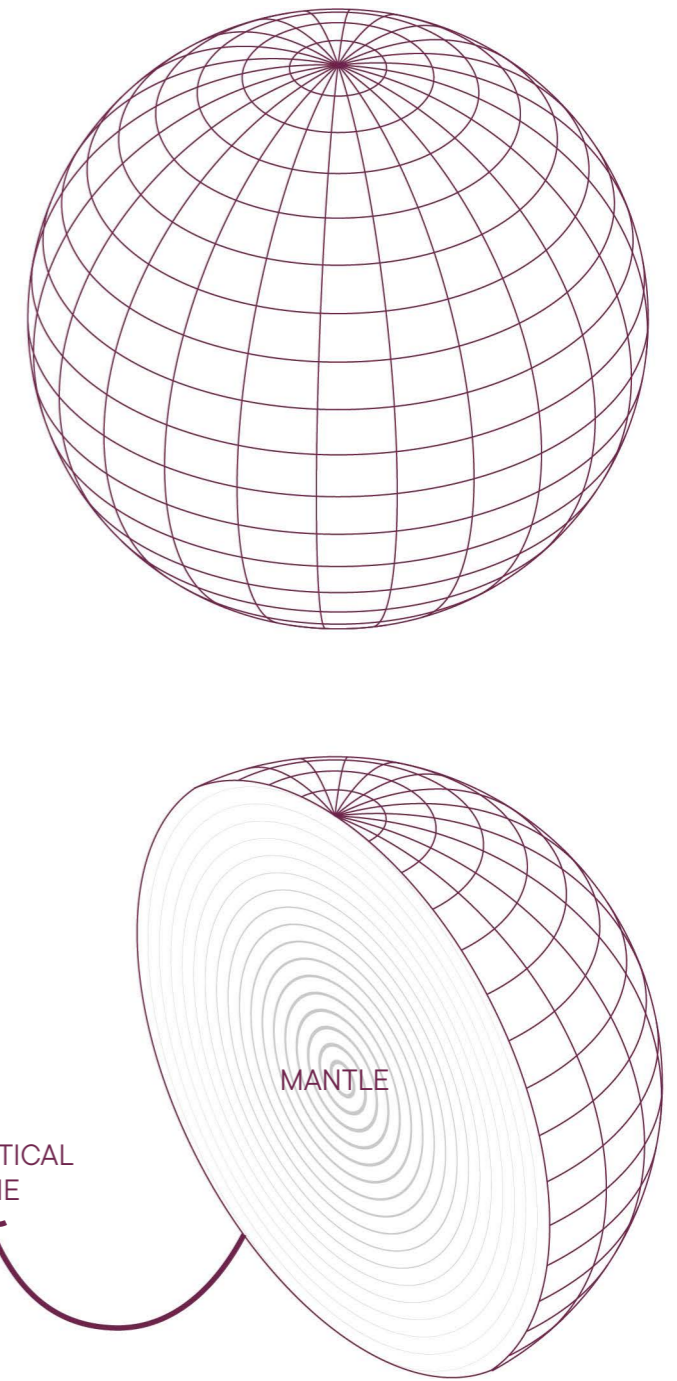
The Critical Zone perspective is the center of Gaiagraphy, which repositions the abstract planetary gaze of traditional Earth system science and replaces it with a radical change of spatial knowledge: rather than mapping landscapes from a detached vantage point, Gaiagraphy suggests that we represent Earth "from within" as researchers, designers, and organisms ingrained in a porous, co-evolving biosphere (Arènes et al., 2018; Latour, 2017).

This methodological tool entails translating scientific and ecological data such as sand temperature profiles, sea turtle nesting behaviors, hydrological flows, and sediment dynamics into narrative maps that protect complexity without reducing agency. Gaiagraphy aims to visualize multispecies relations, temporal entanglements, and conflict zones that conventional planning and zoning maps are likely to erase. Consequently, it advances a mode of spatial knowledge production adapted to the ethical benefits of interspecies justice.

While projects such as Feral Atlas (Tsing et al., 2020) and Terra Forma (Aït-Touati et al., 2020) critically question anthropocentric cartography, they essentially serve as curatorial or speculative frameworks. These projects are vital in demonstrating disrupted ecological relations and imaginative geographies, but they lack the site-specific practical capacity necessary for conscious spatial research and landscape de-

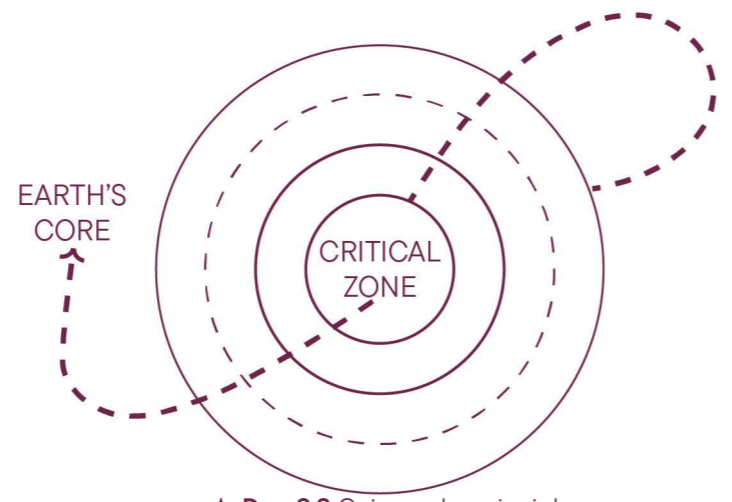
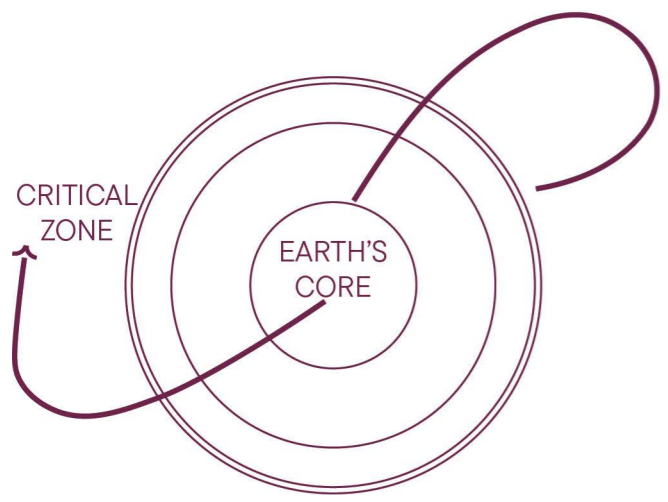
sign. Gaiagraphy was chosen for this study because it provides a methodologically applicable and site-responsive approach, deeply grounded in the Critical Zone, capable of integrating empirical data with ethical and narrative representation. For this reason, Gaiagraphy is particularly well-suited to address the interspecies, ecological, and representational challenges of Patara.

Conclusively, Gaiagraphy is not only a way of visualizing the Earth from a different perspective; it is a repositioning of the mapmaker from distant observer to proactive participant. It sides with the greater post-humanist ethos of the thesis, where designers are not disconnected authors of space but cohabitants within complex multispecies environments. Gaiagraphy brings a conceptual and visual grammar that enables this moral and epistemological repositioning to be materially legible.

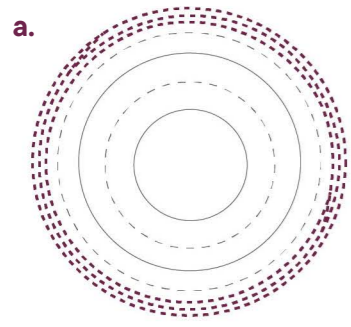


↑ Drg. 2.1 Gaiagraphy principles

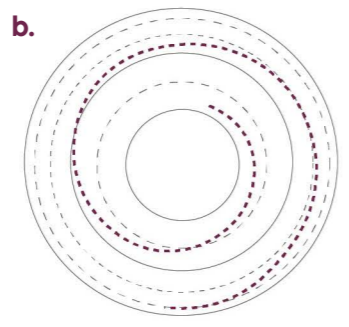
Drawing by the author. Layers redrawn and reinterpreted from (Arènes, 2022)



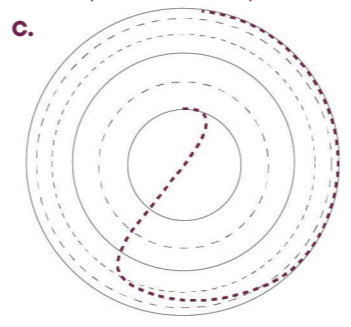
↑ **Drq. 2.2** Gaiagraphy principles  
 Drawing by the author. Layers redrawn and reinterpreted from (Arènes, 2022)



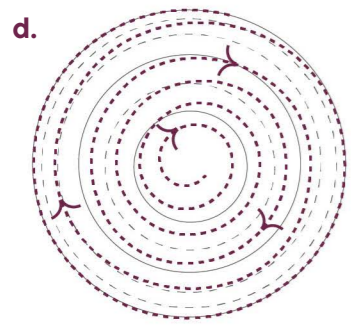
Very Slow



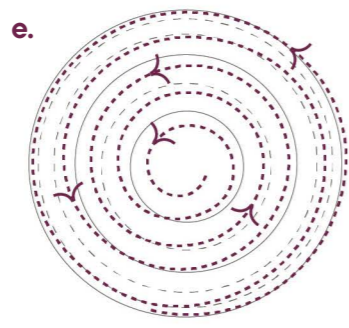
Slow



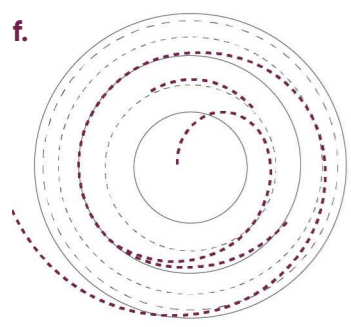
Rapid



Centrifugal



Centripetal

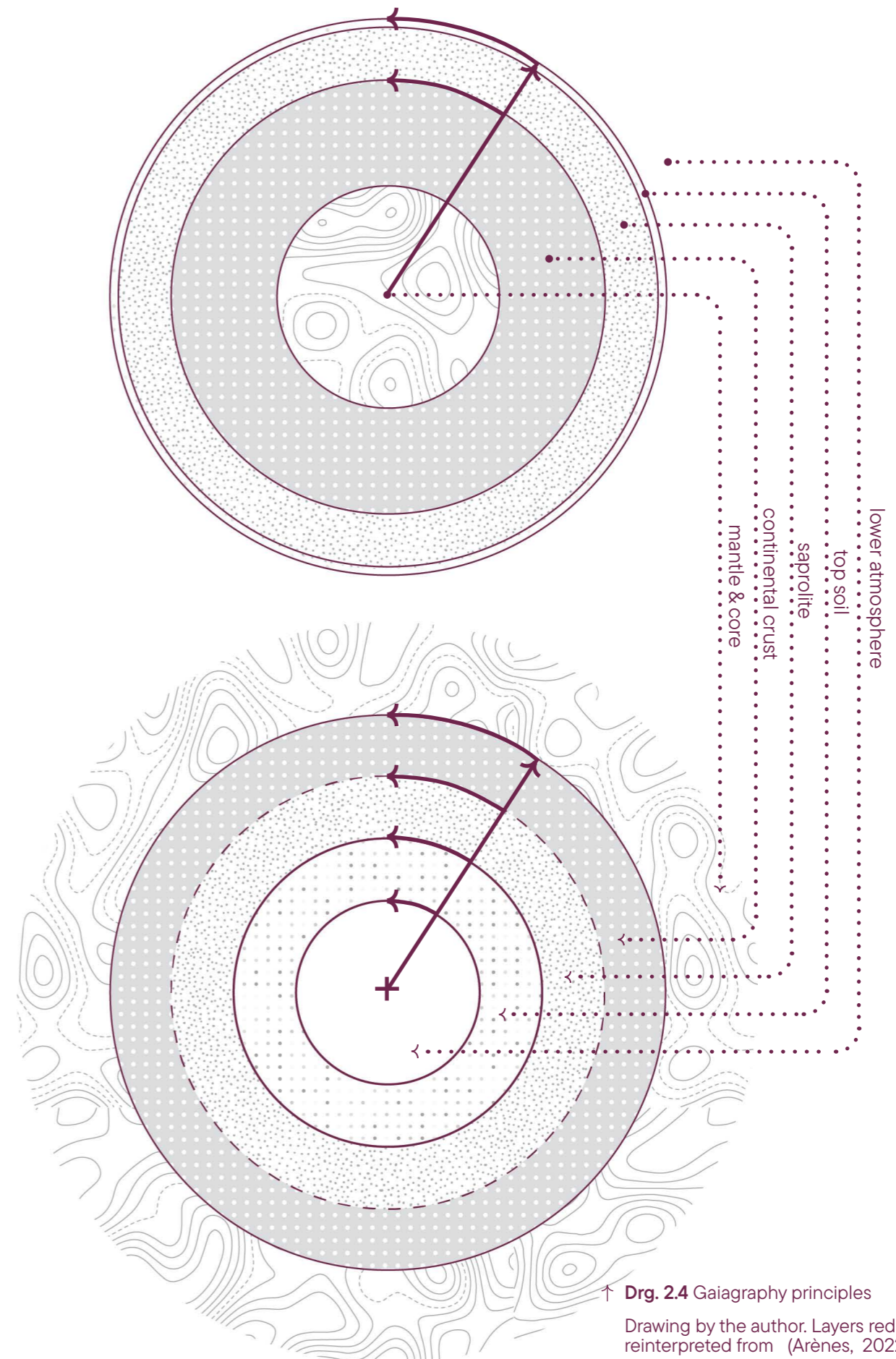


External Leak



Internal Cycle

↑ **Drq. 2.3** Gaiagraphy principles  
 Drawing by the author. Layers redrawn and reinterpreted from (Arènes, 2022)



↑ **Drq. 2.4** Gaiagraphy principles  
 Drawing by the author. Layers redrawn and reinterpreted from (Arènes, 2022)



Fig. 3.1 Dunes at Patara Beach ©Adobe Stock

## Context Analysis : *Patara Beach*

This chapter examines Patara Beach as a mosaic coastal landscape formed by the interaction of ecological systems, multispecies life cycles, and human interventions. Through a multi-scalar spatial analysis, it explores the marine and coastal dynamics of the area, the ecological role of *Caretta caretta*, and the spatial conflicts generated by tourism and developments. By combining ecological mapping with a species-centered perspective, the chapter situates Patara as a contested multispecies territory and sets the analytical groundwork for questioning conventional mapping representations.

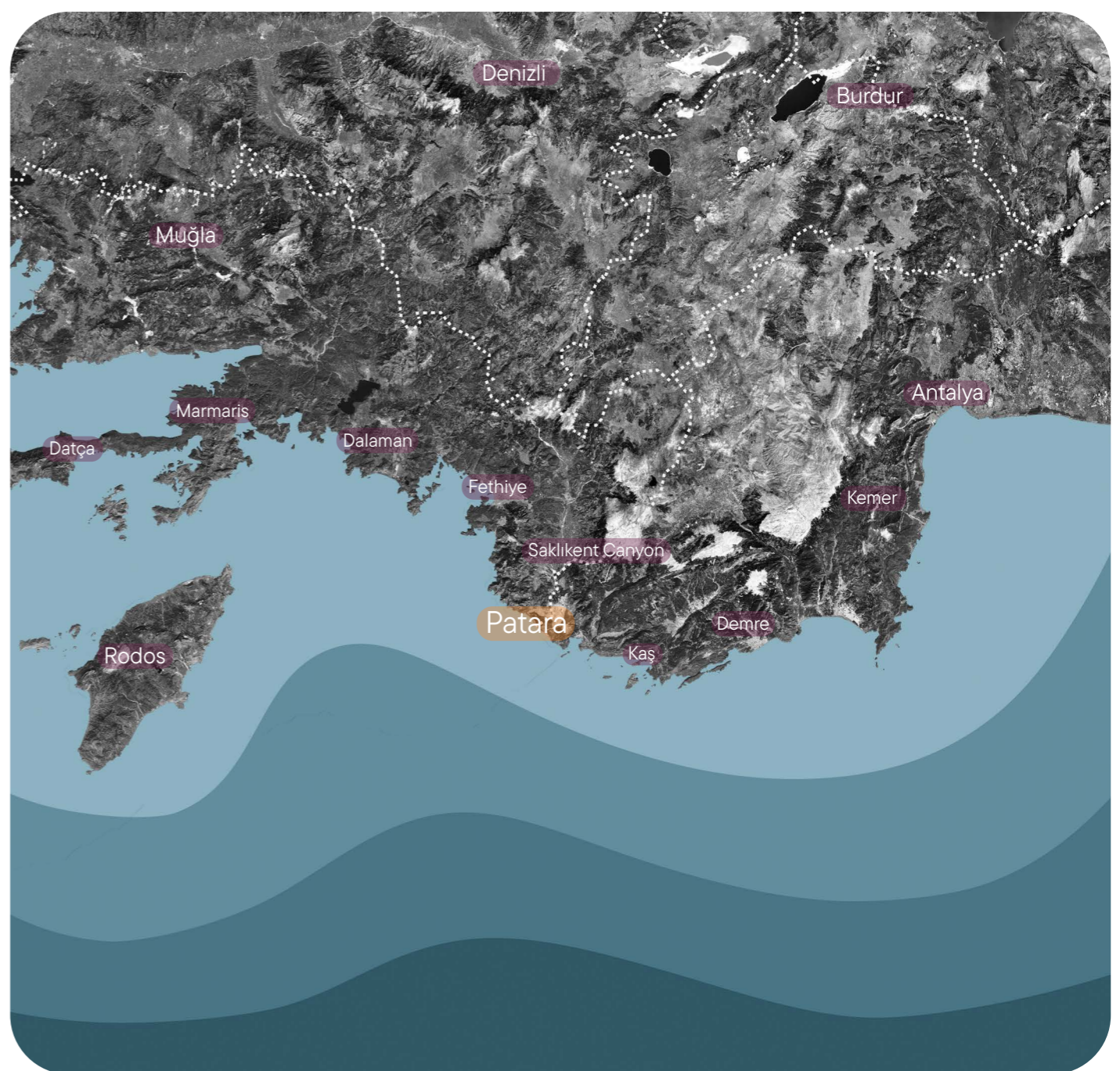
### 3.1 Regional and Coastal Context of Patara Beach

Patara Beach is located on the southwestern Mediterranean coast of Turkey, within the borders of Antalya and Muğla Provinces, where terrestrial, coastal, and marine systems intersect at multiple scales. Regionally (Drg. 3.1), Patara settles between mountainous hinterlands, river systems such as the Eşen and Dargaz Rivers, and the Mediterranean Sea, situating it with a dynamic ecological corridor formed by fluvial input, coastal currents, and aeolian processes. At the smaller scale (Drg. 3.2), the coastal landscape includes an extensive beach, active dune systems, wetlands, forested areas, and agricultural lands, all positioned within overlapping conservation plans, including a Special Environmental Protection Area and multiple archaeological zones (Tanaka, 2018; Erginal et al., 2013). This layered territorial condition discloses Patara not as an isolated natural site, but as a continuous coastal landscape where ecological processes and human interventions coexist and frequently conflict. The proximity of fragile dune systems and nesting zones to archaeological zones, agricultural plots, and touristic access routes depicts how ecological and cultural values are spatially tangled, shaping Patara into a paradigmatic example of a contested Mediterranean coastal landscape.

### 3.2 Marine and Coastal Systems of Patara Beach

The marine and coastal systems of Patara (Drg. 3.3) perform as a single, interconnected ecological sequence formed by sediment transport, dune migration, hydrological flows, and prevailing wind and wave regimes. Longshore currents redistribute sediment along the coastline, while aeolian processes transport sand inland, maintaining active dune systems that are vital for beach stability and nesting habitat formation. These geomorphological processes are strictly linked to inland river systems and seasonal weather changes, causing the coastline to be highly sensitive to both natural variation and human intervention (Erginal et al., 2013; Bird, 2008). In this system, ecological resilience rests on the uninterrupted movement of sand, water, and species. Disruptions to sediment flow, vegetation, or hydrology, whether via afforestation, infrastructure, or altered land use, can destabilize dune systems and decrease the suitability of nesting habitats. Mapping these dynamics discloses Patara as a living coastal organism rather than a static shoreline, foregrounding the material conditions that support multispecies coexistence.

### Regional Context of Patara



↑ Drg. 3.1 Territorial Scale of Patara

By author, from data published by Google Earth, (2021).  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat / Copernicus

### Coastal Landscape of Patara Beach



↑ **Drg. 3.2** Coastal Landscape of Patara  
 By author, adapted from OSM, (2025);  
 Patara Zoning Plan, (2022).

- Dune
- Beach zone
- Marshes
- Waterbodies
- Sclerophyllous vegetation
- Grassland
- Forest
- Absolute protection zone
- Anthropogenic inland pressures
- Tampon area
- Grassland
- Patara archaeological site

### 3.3 Interspecies Conflict Zones at Patara Beach

Human interventions at Patara intersect directly with fragile ecological zones, creating spatial conflicts that immensely affect non-human life. Seasonal tourism boosts foot traffic, artificial lighting, noise, and temporary infrastructures close to the nesting beach during the same months when *Caretta caretta* nests and incubates their eggs. Artificial lighting from camping areas and over the dunes disrupts nesting behavior and disorients hatchlings, while beach compaction and vehicles access damage nesting substrate and dune morphology (Witherington and Marting, 2000; Attum and Nagy, 2024).

These conflict zones (Drg. 3.4) are not coincidental but spatially produced through planning decisions that prioritize accessibility, visibility, and economic use over ecological patterns. Despite formal protection statuses, enforcement remains unequal, allowing anthropogenic pressures to overlap with critical zones. Mapping these zones spatializes interspecies injustice, making visible how human-centered landscape mindsets materialize as ecological harm.

### 3.4 *Caretta caretta* as a Spatial & Temporal Actor

Reframing *Caretta caretta* as a spatial and temporal actor (Drg. 3.5) changes the analytical perspective from anthropogenic usage of space to species-specific spatial organization. Nesting distance from the shoreline, dune elevation, sand moisture, and seasonal pattern structure how the beach is used by sea turtles in all. These biological parameters create a spatial logic that alters fundamentally from human zoning or infrastructure planning.

When it is mapped, the *Caretta caretta*'s lifecycle reorganizes the coastline into temporal bands such as nesting, incubation, and hatching, enclosing how space is activated differently all over the year. This perspective questions anthropocentric spatial hierarchies by positioning the turtle's physiological needs and temporal patterns as legitimate organizers of the landscape rather than external restraints.

# Marine & Coastal Ecosystems of Patara Beach

S: 1/15.000 0 0.75 1.5 km



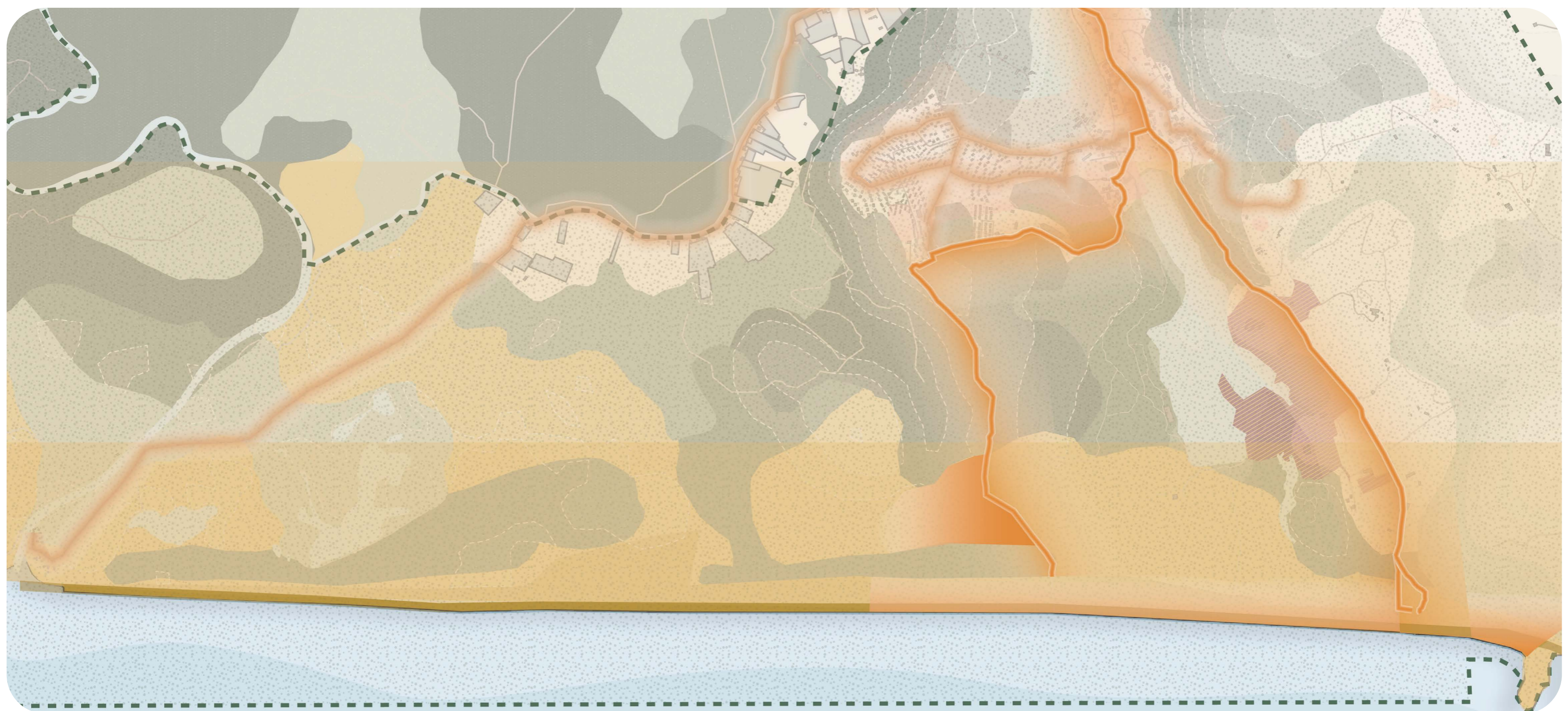
- Waterbodies
- Sclerophyl Vegetation
- Forest
- Marshes
- Grassland
- Agricultural Land
- Buildings
- Dunes
- Beach Zone
- Greenhouses
- Topography Lines
- Main Roads
- Dirt Road
- Footway
- Prevailing Wind Direction
- Longshore Sediment Transport (Marine-driven)
- Aeolian Sand Transport (Wind-driven)
- Sediment Erosion Zone
- Sediment Accumulation Zone



↑ **Drp. 3.3** Marine and Coastal Ecosystem of Patara Beach

By author, adapted from OSM, 2025, COGOW, (2026). Sediment movement patterns are derived from coastal geomorphological studies of Patara Beach and Mediterranean coastal systems (Erginal et al., 2013; Hesp, 2002; Bird, 2008).

# Interspecies Conflict Zones at Patara Beach



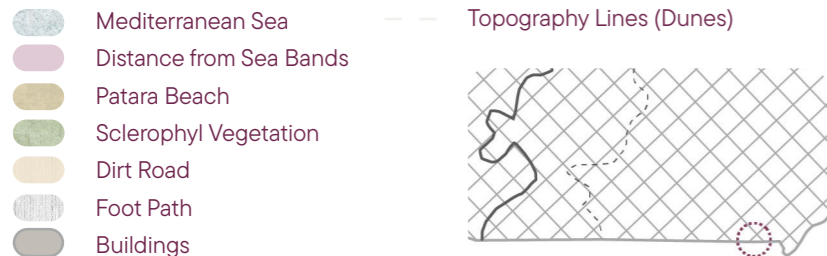
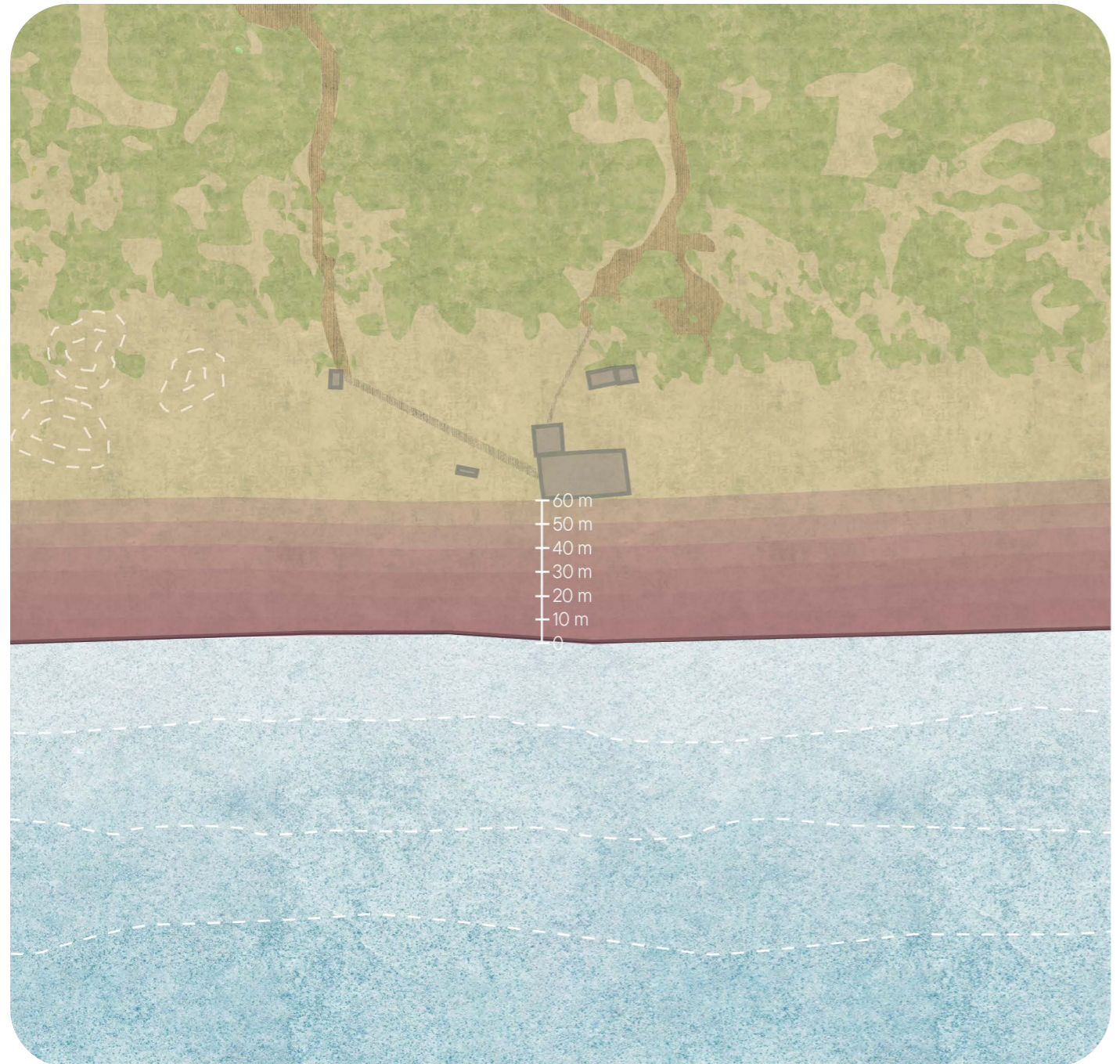
- |                       |                  |                          |   |
|-----------------------|------------------|--------------------------|---|
| Waterbodies           | Dunes            | Archaeological Area      | <b>Artificial Light as Ecological Disturbance</b> |
| Sclerophyl Vegetation | Beach Zone       | Natural Protection Area  | Highest Density Light Pollution                   |
| Forest                | Greenhouses      | High Visitor Density     | Moderate Density Light Pollution                  |
| Marshes               | Topography Lines | Moderate Visitor Density | Lowest Density Light Pollution                    |
| Grassland             | Main Roads       |                          |   |
| Agricultural Land     | Dirt Road        |                          |   |
| Buildings             | Footway          |                          |   |



↑ **Drg. 3.4** Interspecies Conflict Zones at Patara Beach

Human activity intensity and light pollution are represented qualitatively based on field observation, and spatial indicators such as access paths, roads, and built structures (Author's observation, 2025; OSM, 2025; COGOW, 2026; Patara Zoning Map, 2022).

### Caretta caretta as a Spatial & Temporal Actor



↑ **Drg. 3.5** *Caretta caretta* as Spatial and Temporal Actor  
 Drawing by the author. Layers redrawn and reinterpreted from Airbus (2026).

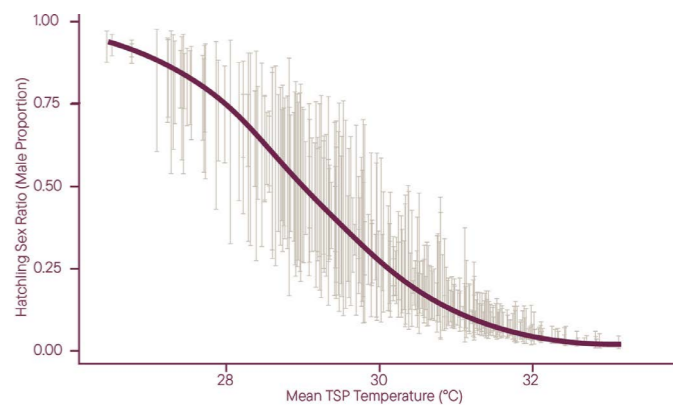
### 3.5 *Caretta caretta* in the Mediterranean

*Caretta caretta* is a long-lived marine reptile recognized as *vulnerable* on the IUCN Red List, with the Mediterranean subpopulation classified as genetically distinct and of high conservation status (IUCN, 2020). *Caretta caretta* take up large marine territories throughout the Mediterranean basin, distributed across Greece, Turkey, Cyprus, Libya, and Italy (Drg. 3.7, 3.9). Satellite tracking and tagging studies reveal that the sea turtles nesting on Turkish beaches, including Patara, travel hundreds to thousands of kilometers between feeding and nesting sites (Drg. 3.8), often crossing national borders and connecting Patara to more extensive Mediterranean and Atlantic marine systems (NOAA Fisheries, 2025).

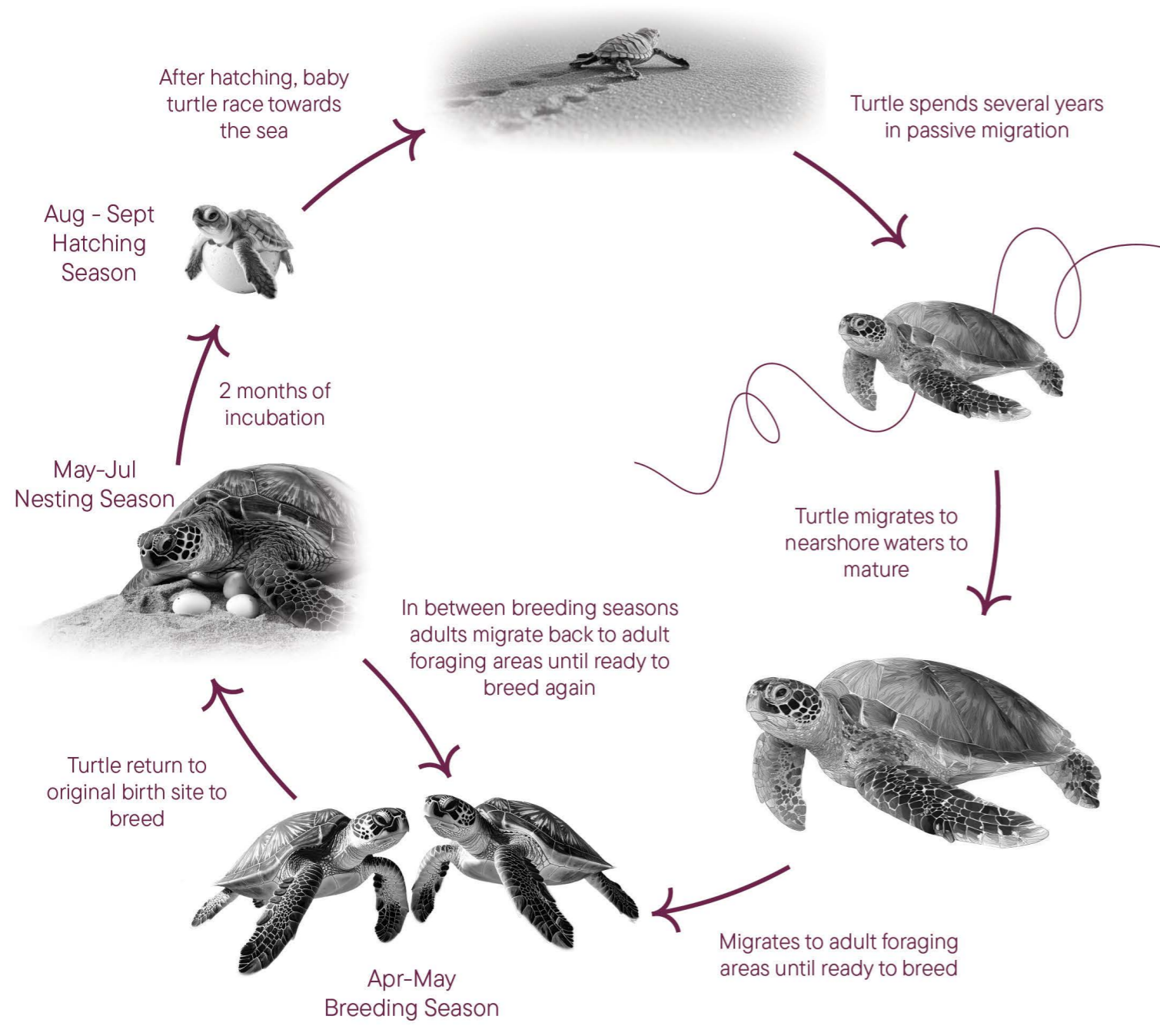
Nesting commonly appears between May and July (Drg 3.6), when females arrive at night to lay eggs in sandy beaches above the high-tide line. Incubation lasts roughly 50-60 days, after which hatchlings come up and direct themselves toward the sea. A critical biological characteristic of *Caretta caretta* is temperature-dependent sex determination: cooler sand temperatures typically generate male hatchlings, while warmer sands generate females (Graph 3.1). Increasing sand temperatures related to climate change have been shown to distort sex ratios and raise embryonic death, presenting long-term risks to

population viability (Hawkes et al., 2009).

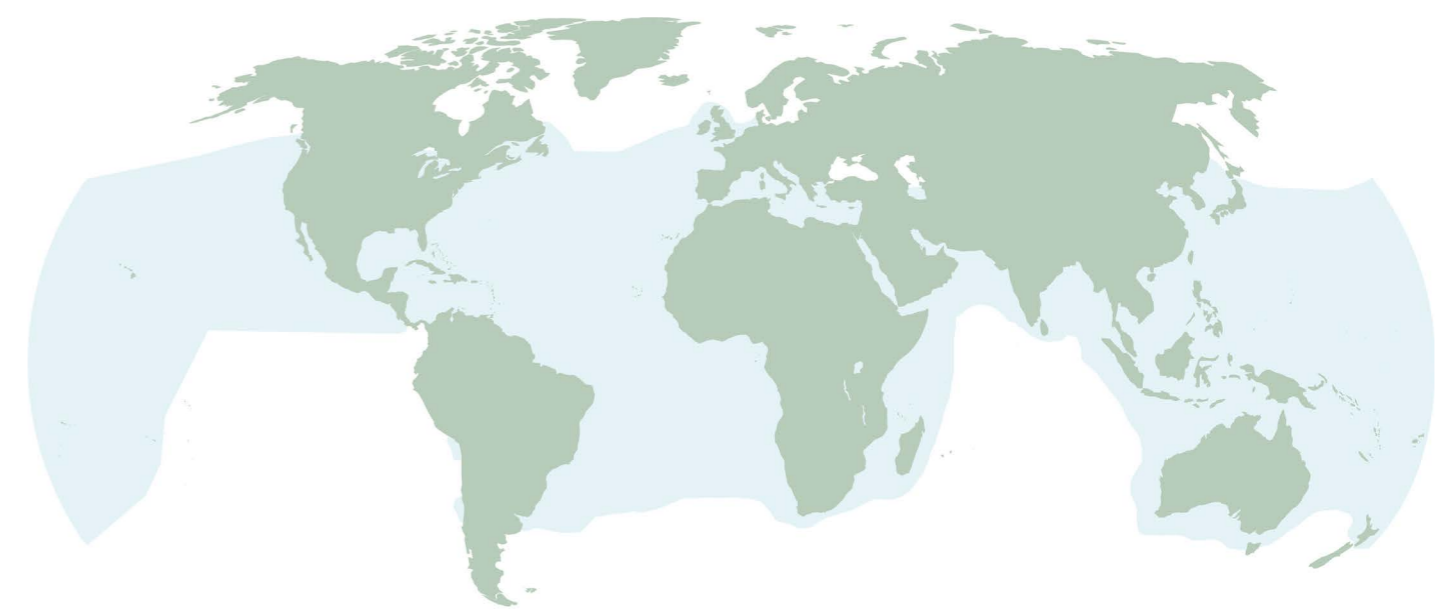
Major threats encountered by *Caretta caretta*s include habitat loss, light pollution, beach compaction, fisheries, coastal development, and climate-driven changes in nesting conditions (IUCN, 2020; NOAA Fisheries, 2025). These vulnerabilities make nesting beaches like Patara ecologically irreplaceable, as strong reproductive behavior means that the loss or degradation of a single site can have population-wide consequences.



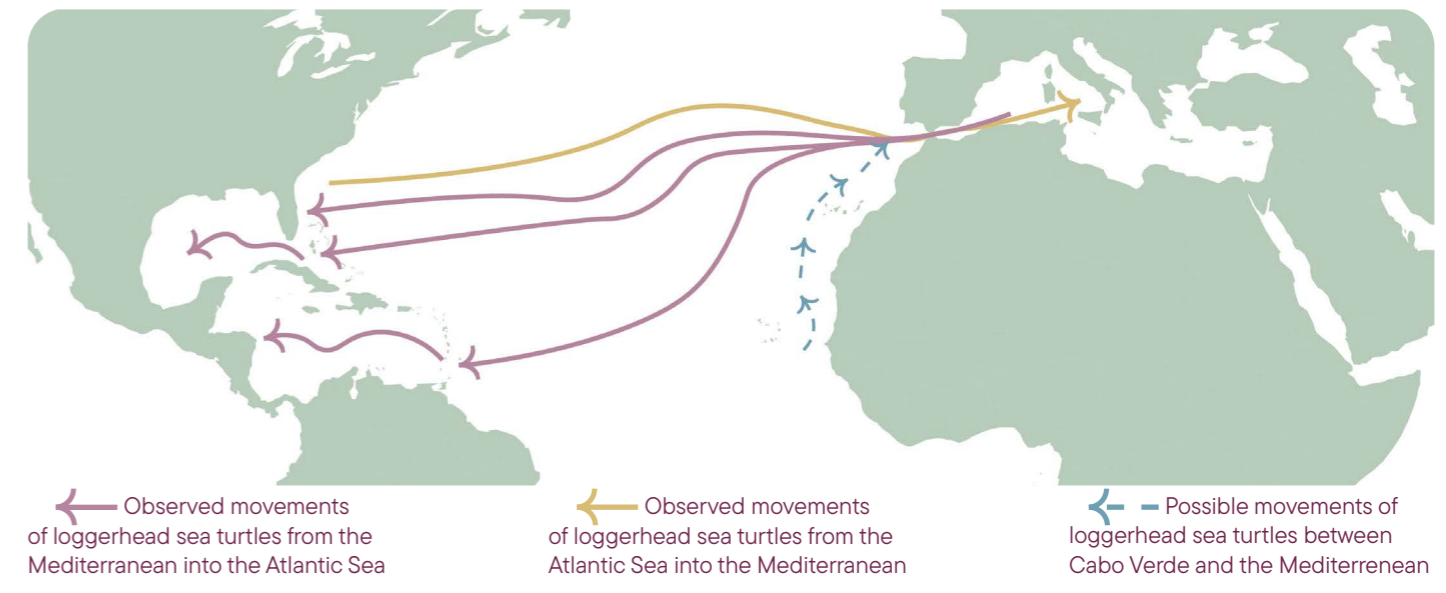
↑ **Graph 3.1** Male proportions of hatling *Caretta caretta* at Dalyan Beach (Kirkham et al., 2025)



↑ **Drp. 3.6** Lifecycle of Marine Turtles  
Redrawn by the author, based on the graphics by Susie Gibson for MRC.



↑ **Drp. 3.7** World map providing approximate representation of the loggerhead turtle's range  
Drawing by the author. Layers redrawn and reinterpreted from NOAA Fisheries (2025).



↑ **Drp. 3.8** Migration routes of sea turtle populations  
Drawing by the author. Layers redrawn and reinterpreted from IUCN (2022).

# Caretta caretta in the Mediterranean: A Scalar Context



- Caretta caretta summer grounds
- Main foraging areas of Caretta caretta
- Main neritic foraging & overwintering areas of Caretta caretta
- Stable nesting site of Caretta caretta
- Occasional nesting sites of Caretta caretta

↑ **Drq. 3.9** Marine Turtles in the Mediterranean  
 Drawing by the author. Layers redrawn and reinterpreted from IUCN (2020).

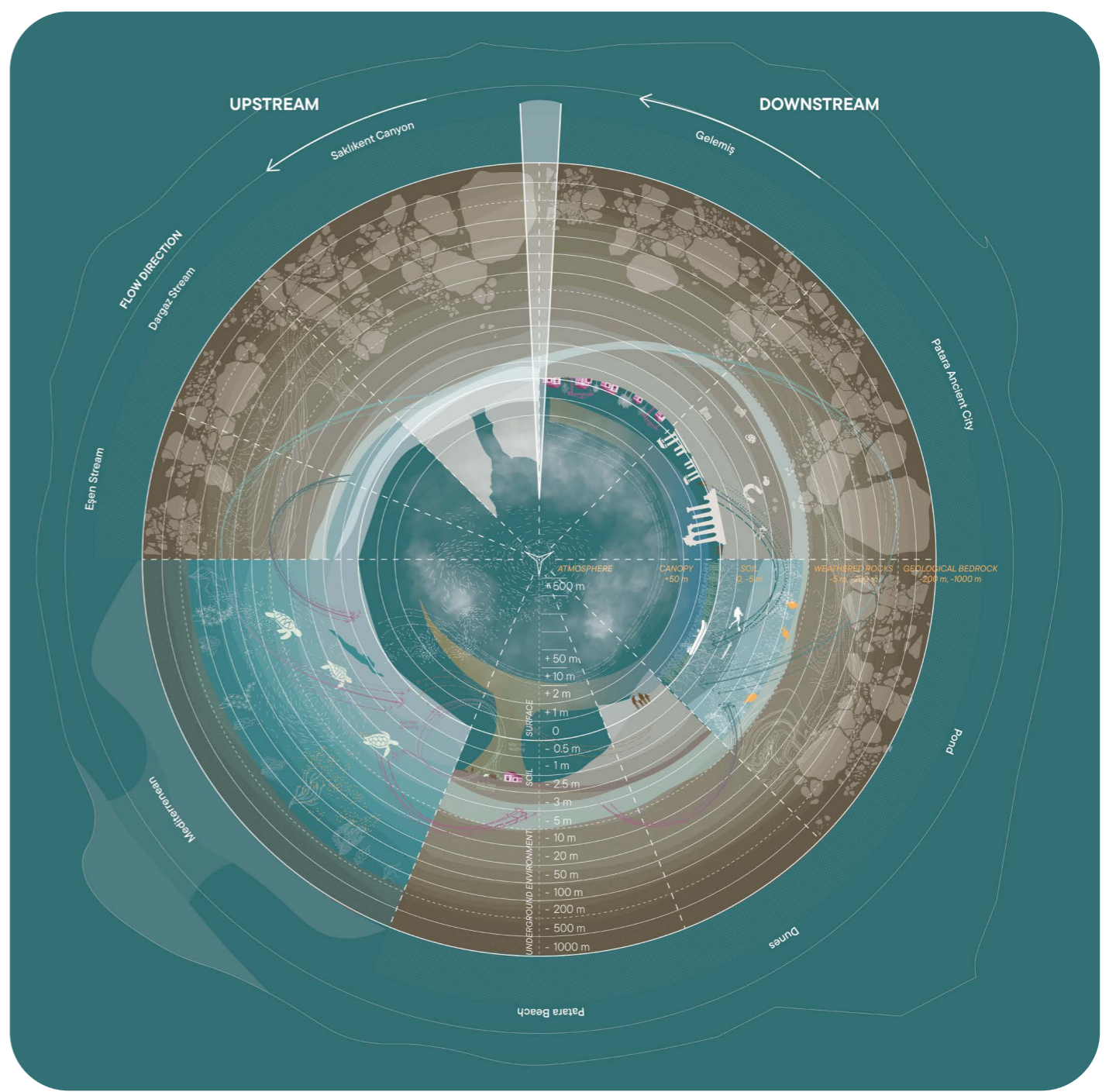
### 3.6 Limits of Conventional Mapping & the Need for Gaiagraphy

Conventional cartographic practices commonly fragment these dynamics into isolated layers such as land use, zoning, and infrastructure, prioritizing static, human-centered representations that conceal ecological interdependencies and multispecies temporalities. Such maps illustrate the landscape as a governable surface and diminish ambiguity, process, and non-human agency. Consequently, they reproduce human-centered speculations and systematically exclude interspecies justice from spatial decision-making.

Gaiagraphy (Drg. 3.10) is proposed as an alternative representational method able to address these limitations. Instead of organizing space around human function or property, Gaiagraphy prioritizes the Critical Zone, integrating vertical depth, temporal patterns, and multispecies relations into a single mapping narrative (Arènes et al., 2018; Latour, 2017). In the Patara context, Gaiagraphy allows the visualization of marine-coastal dynamics, turtle lifecycles, sediment dynamics, and conflict zones as interconnected phenomena. This method does not provide solutions but repositions mapping as a critical voice. One that discloses ecological entanglements before design or planning decisions are made, creating spaces for interspecies justice to be recognized within spatial practices.

The contextual analysis presented in Chapter 3 has disclosed Patara Beach as a multi-layered and contested coastal landscape, where ecological processes, multispecies lifecycles, and human activities intersect across spatial and temporal scales. Through the analysis of marine-coastal systems, interspecies conflict zones, and the spatial logic of *Caretta caretta*, it becomes evident that traditional cartographic practices are inadequate to represent these entanglements without diminishing them into static, anthropocentric abstractions. This analytical foundation establishes the requisition for an alternative representational method, one able to hold ecological depth, temporal patterns, and non-human agency within a single spatial narrative. Building upon these findings, Chapter 4 introduces the Gaiagraphy of Patara as the principal outcome of the thesis, positioning mapping not as an illustrative tool but as a critical voice that repositions spatial understanding and decision-making toward interspecies justice.

### Gaiagraphy of Patara: A More-Than-Human Cartography



↑ **Drg. 3.10** Gaiagraphy of Patara  
By author, adapted and reinterpreted from COGOW, 2026; Erginal et al., 2013; Hesp, 2002; Bird, 2008; Susie Gibson for MRC; Airbus, 2026. Light pollution are represented qualitatively based on field observation.

## Chapter 4.



Fig. 4.1 Dunes at Patara Beach ©Adobe Stock

# ***Gaiagraphy as a Critical Voice***

This chapter presents the Gaiagraphy of Patara as the central outcome of the study and positions mapping itself as a critical action. Instead of operating as an illustrative summary or representational complement to the previous analysis, the Gaiagraphy functions as a methodological attitude that intervenes in how landscapes are understood, narrated, and acted on. Building on the contextual and theoretical groundwork set up in the previous chapters, this section reexamines mapping as an active spatial claim that makes visible ecological dynamics, multispecies temporalities, and systematically produced conflicts before design or planning decisions are made. Thanks to this lens, mapping becomes a critical voice that questions human-centered spatial logic and opens space for interspecies justice to be recognized within landscape practice.

## 4.1 Why a Gaiagraphy of Patara?

This chapter indicates a shift from contextual analysis to the articulation of the thesis outcome. It does not present Gaiagraphy as a visual complement or representational ornament of the earlier research, but as an intentional methodological and epistemological position. The Gaiagraphy of Patara is imagined as an

*Gaiagraphy not as a visual complement or representational ornament of the earlier research, but as an intentional methodological and epistemological position.*

active spatial argument challenging how landscapes are traditionally known, represented, and governed. Thus, the maps produced in this chapter are not illustrations of preceding findings but the primary medium through which the thesis propels its questioning of anthropocentric spatial practices and explores alternatives built on interspecies justice.

The analysis developed in Chapter 3 displayed that Patara Beach is not merely a protected natural site or an archaeological landscape, but a contested coastal territory where ecological processes, multispecies lifecycles, and human governance intersect across unequal temporal and spatial scales. Conventional planning documents and cartographic representations have demonstrated deficiencies in engaging with this entanglement. By fragmenting the landscape into iso-

lated layers such as land use, zoning, or infrastructure, conventional maps lean on stabilizing what is in fact dynamic, camouflaging ecological interdependencies, and marginalizing non-human agency. In doing so, they inevitably frame spatial decision-making around human priorities, portraying multispecies relations as secondary or invisible.

Gaiagraphy is utilized in this thesis specifically to challenge these limitations. Instead of organizing space according to human mobility, ownership, or administrative boundaries, Gaiagraphy performs from the perspective of the Critical Zone, the thin, delicate layer where life, matter, and atmosphere interact. This repositioning allows spatial representation to draw away from an abstract, top-down approach and toward a settled, relational understanding of landscape. In the Patara context, this translates into mapping not simply where things are located, but how sand moves, how dunes migrate, how seasonal patterns structure space, and how the lifecycle of *Caretta caretta* reorganizes the shoreline through time.

The purpose of Gaiagraphy in this chapter presents three interconnected aims. First, it repositions spatial decision-making by exposing the presumptions planted within traditional mapping practices. By making apparent what is usually disregarded, such as

non-human temporalities, ecological thresholds, and material dependencies, Gaiagraphy examines the neutrality of maps and discloses their role in forming political and planning outcomes. Rather than resolving tensions through spatial solutions or masterplans, Gaiagraphy foregrounds overlaps, frictions, and incompatibilities between human activities and ecological processes. That is the reason conflict is perceived not as a design problem to be solved, but as a condition that must be recognized and negotiated ethically. Third, Gaiagraphy centralizes non-human agency by enabling species such as *Caretta caretta*, as well as geomorphological and climatic processes, to function as organizers of space and time. This shift questions anthropocentric hierarchies and reframes the landscape as a multispecies territory formed by allocated agency.

Principally, this method does not propose to replace scientific accuracy with speculation, nor to aestheticize ecological data. Instead, it operates at the intersection of empirical knowledge and critical interpretation. Scientific datasets related to marine systems, sediment dynamics, nesting behavior, and seasonal patterns are translated into cartographic representation that preserves entanglement without collapsing it into rigid categories. This translation rec-

*Mapping as a form of spatial interrogation that can intervene in how landscapes are perceived before decisions are made.*

ognizes that mapping is always an interpretive action and embraces this condition as an ethical responsibility rather than a methodological defect.

By employing Gaiagraphy as both method and outcome, this chapter positions mapping as a form of spatial interrogation that can intervene in how land-

scapes are perceived before decisions are made. The Gaiagraphy of Patara does not offer design solutions, conservation strategies, or planning suggestions. Alternatively, it acts as a critical voice that asserts slowing down spatial reasoning, expanding the field of visibility, and reevaluating whose lives and temporalities are allowed to be important in the production of space. Thus, it forms the ground for a reorientation of architectural and landscape practice toward interspecies justice, without closing the field through design resolutions too soon.

## 4.2 Translating Analysis into Cartographic Language

The shift from analysis to cartographic representation is not a neutral or automatic process. In this thesis, mapping is not studied as a final illustration of already-resolved findings, but as an active methodological step in which analytical know-how is translated, interpreted, and re-articulated through spatial form. The Gaiagraphy of Patara arises strictly at this threshold: where scientific data, ecological processes, and qualitative observations are transformed into a cartographic language that can hold multispecies relations, temporal depth, and spatial conflict within a sole representational area.

The data translated into the Gaiagraphy functions across multiple fields. Quantitative and scientific datasets involve marine-coastal systems, sediment migration, dune dynamics, hydrological flows, nesting zones, and vertical depth across the Critical Zone. These data are measured, sourced from ecological studies, geomorphological research, and environmental monitoring, and keep their empirical grounding within the map. Simultaneously, the Gaiagraphy merges temporal data such as seasonal nesting cycles, incubation periods, and sediment rhythms, which cannot be depicted through conventional linear timelines without losing their spatial effects. Rather,

***The multispecies spatial relations cannot be completely attained through numerical abstraction without recreating the anthropocentric simplifications.***

time is embedded as layered and periodic, revealing how ecological processes persist, overlap, and intervene with one another instead of progressing in a particular direction.

Besides measurable data, the mapping combines qualitative and interpretive information stemmed from field observation, spatial reading, and critical analysis. Human activities, intensity of usage, conflict zones, and interspecies friction are not mapped as rigid quantities but as gradients, thresholds, and spatial atmospheres. These aspects are interpreted instead of precisely measured, not on behalf of a lack of accuracy, but because their nature is relational, conditional, and situational. Thus, interpretation is not a methodological deficiency but an explicit ethical and epistemological position. It recognizes that multispecies spatial relations cannot be completely attained through numerical abstraction without recreating the same anthropocentric simplifications the study is attempting to critique.

Certain aspects within the Gaiagraphy are deliberately blurred, softened, or somewhat excluded. Blur-

ring is used where ecological boundaries are permeable instead of rigid, such as transitions between marine and coastal zones or between dune systems and nesting areas. Exclusion functions as a critical tool to withstand representational overload and to refrain from intensifying dominant human infrastructures as primary spatial organizers. Roads, buildings, and formal zoning are reduced or omitted not because they are unrelated, but because their visual dominance in conventional maps already shapes planning decisions. Their minimization allows non-human agencies such as sand, water, turtles, and seasonal patterns to appear as spatial actors rather than background conditions.

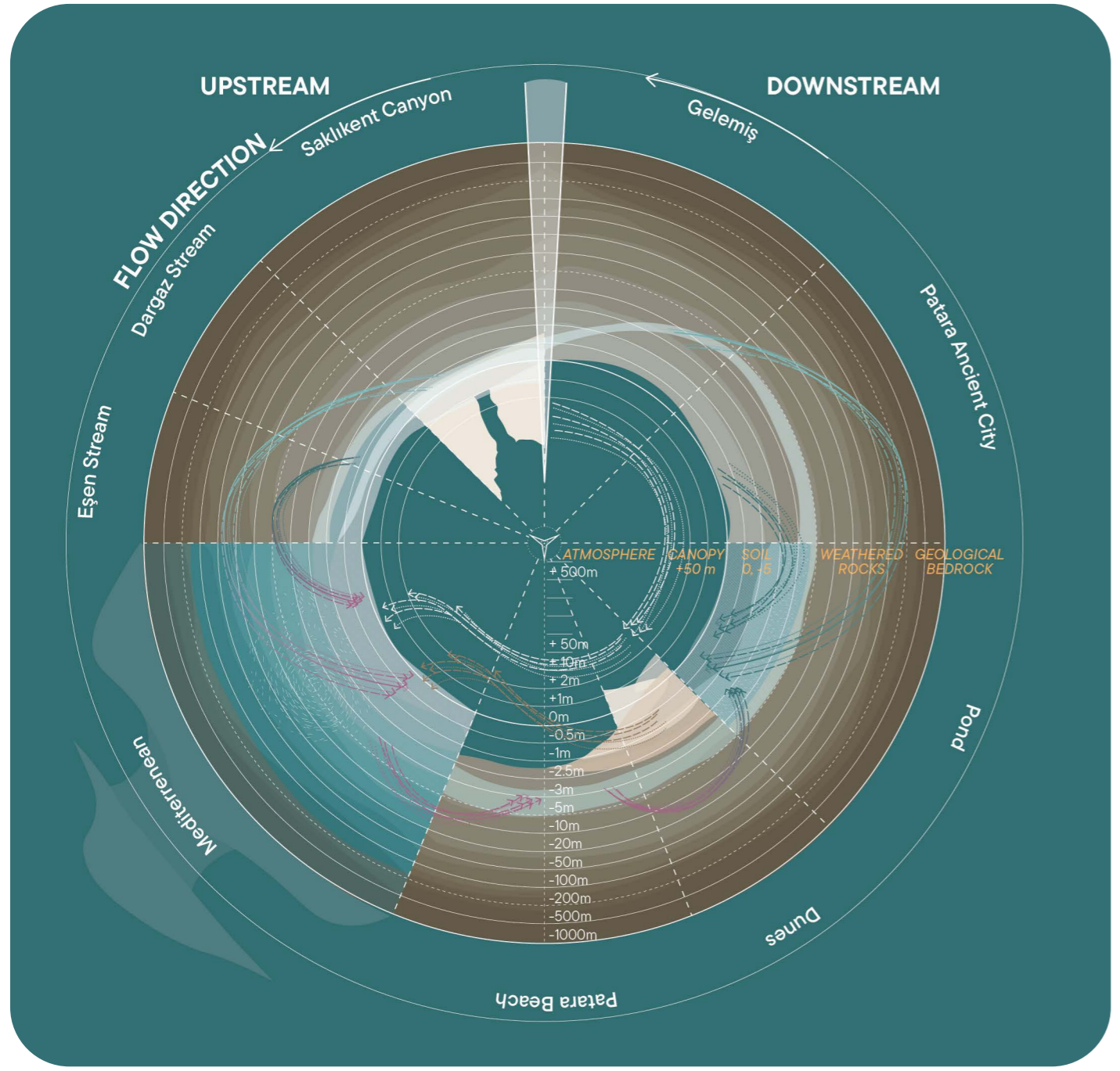
Time is also not represented as a linear order or a before-and-after condition. Rather, it is layered within the map through concentric structures, vertical sections, and overlapping temporal bands. This indicated the lived phenomenon of Patara's landscape, where nesting, tourism, erosion, and sediment migration emerge simultaneously and unequally. By rejecting linear temporality, the Gaiagraphy counteracts solution-oriented narratives and instead foregrounds continuous coexistence, vulnerability, and conflict.

Using these choices, the Gaiagraphy does not of-

fer objectivity and completeness. Instead, it positions itself as a situated, critical, and ethical representation that translates analysis into a spatial language lined up with interspecies justice. The mapping practice becomes a form of spatial debate: one that does not resolve conflicts but makes them visible before design or planning interventions take place. This translation process positions the Gaiagraphy of Patara not as an ornamental outcome, but as a methodological foundation for reconsidering how landscapes are read, valued, and governed in more-than-human terms.

***The mapping practice becomes a form of spatial debate: one that does not resolve conflicts but makes them visible before design or planning interventions take place.***

### 4.3 The Gaiagraphy Maps Marine-Coastal Ecosystem as a Living Continuum



- — Salt Water
- — Fresh Water w/ Little Oxygen (underground)
- — Fresh Water w/ Oxygen (surface, young)
- — Prevailing Wind Direction
- — Sediment Movement Direction

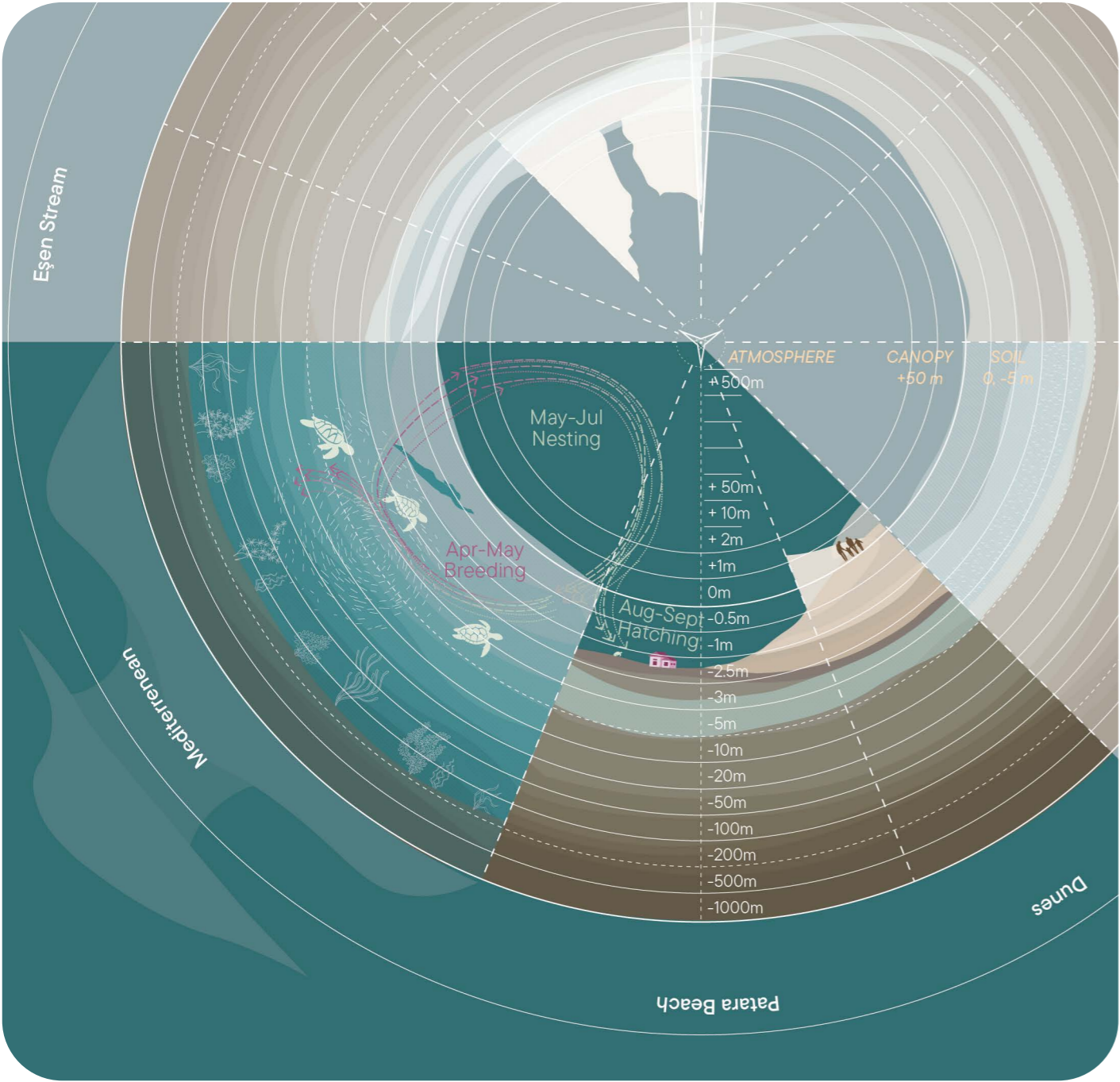
↑ **Drp. 4.1** Marine - Coastal Ecosystem as a Living Continuum

By author, adapted from COGOW, (2026). Sediment movement patterns are derived from coastal geomorphological studies of Patara Beach and Mediterranean coastal systems (Erginal et al., 2013; Hesp, 2002; Bird, 2008).

This map institutes Patara not as a confined site but as a continuous marine-coastal system formed by material flows instead of regulatory limits. By visualizing sediment transport, prevailing wind directions, freshwater inputs, and vertical depth across the Critical Zone, the map reframes the shoreline as an active ecological junction where land, sea, and atmosphere regularly interact. The circular structure refuses the linear coastline logic common to traditional mapping and rather stresses continuity, reciprocity, and movement. Thus, it foregrounds geomorphological processes such as sediment migration, dune formation, and hydrological exchange as spatial agents that ardently produce the beach and its ecological conditions over time.

Instead of considering these processes as background environmental data, the map positions them as foundational to any spatial understanding of Patara. This change is critical: it discloses that what comes out as a stable beach is, in fact, the temporary outcome of continuous material negotiations. By focalizing flows instead of parcels, the map questions directly zoning-based planning logics that presume rigidity and control. It establishes the epistemological ground for the maps that follow, arguing that space at Patara is not designed, owned, or stabilized first, but repeatedly made through ecological connections that precede and outpace human intervention.

### Caretta caretta Ecology & Temporal Rhythms



- Salt Water
- Nesting Movement
- Nesting Zone

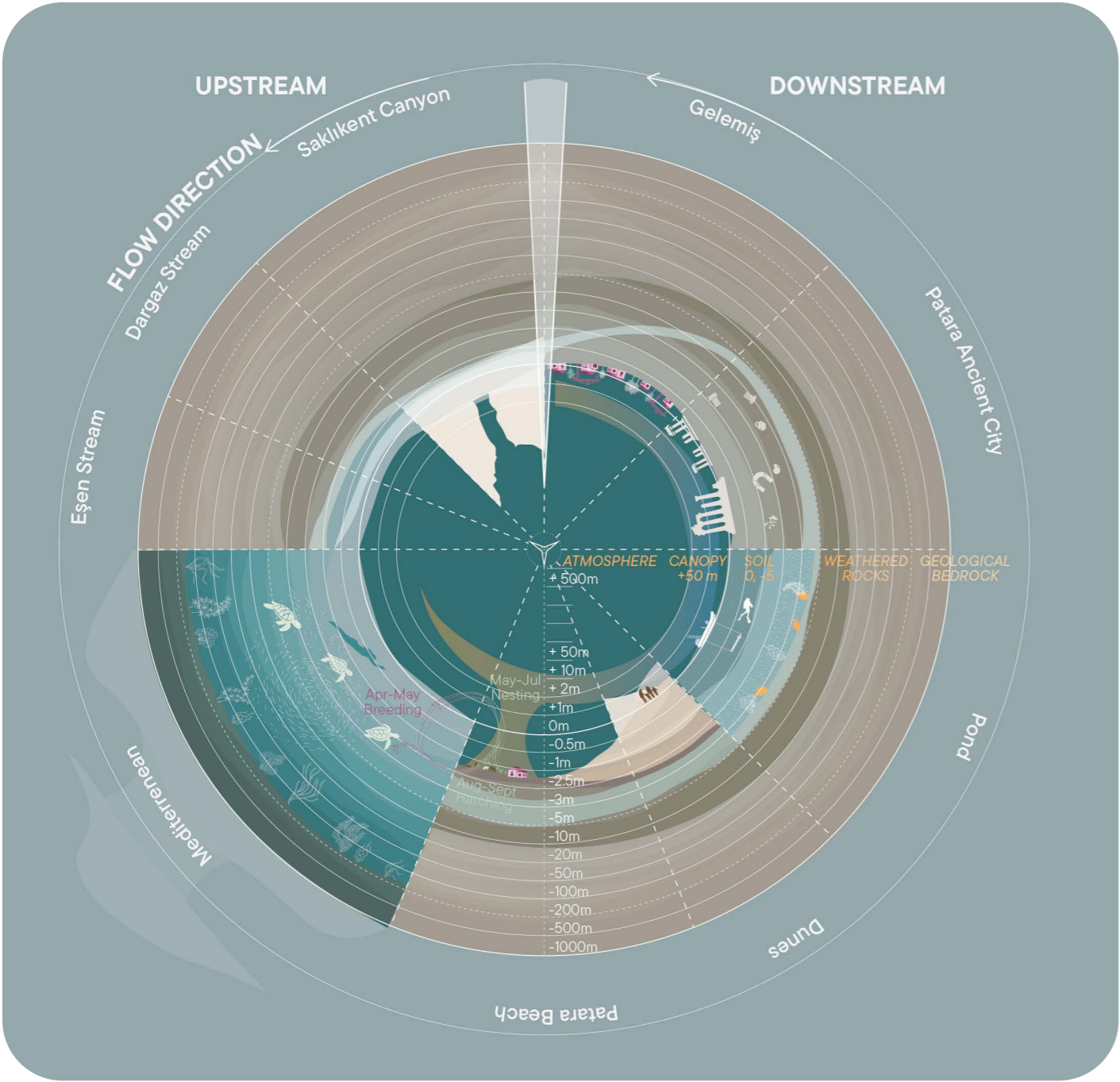
↑ **Drp. 4.2** Caretta caretta Ecology and Temporal Rhythms  
 By author, adapted and reinterpreted from the graphics by Susie Gibson for MRC and Airbus (2026).

Leaning on the systemic foundation of the previous map, this Gaiaography presents species-specific time as a spatial force. The lifecycle of *Caretta caretta*, which is nesting, incubation, and hatching, is mapped as a cyclical occupation of the coast, controlled by distance from the sea, sand depth, and seasonal patterns. Rather than positioning turtle nesting as a rigid conservation layer, the map demonstrates it as a temporal choreography that restructures the beach over the year. Time here is not linear or extrinsic to space; it is embedded within spatial bands that widen, contract, and overlap.

As a result, the map shakes anthropocentric temporalities that dominate coastal planning, such as tourism seasons or rigid land-use calendars. The

*Caretta caretta*'s biological patterns disclose a different organization of space: the beach is a nesting ground by turns, an incubation zone, and a hatching corridor. This temporal understanding of the landscape exposes how traditional cartography fails not because it lacks data, but because it prioritizes human time over ecological time. Therefore, the map becomes an argument for identifying non-human temporalities as valid spatial agencies instead of conducting seasonal constraints.

### Spatial Conflict as a Produced Condition



- — Salt Water
- - Nesting Movement
- Nesting Zone
- Light Pollution

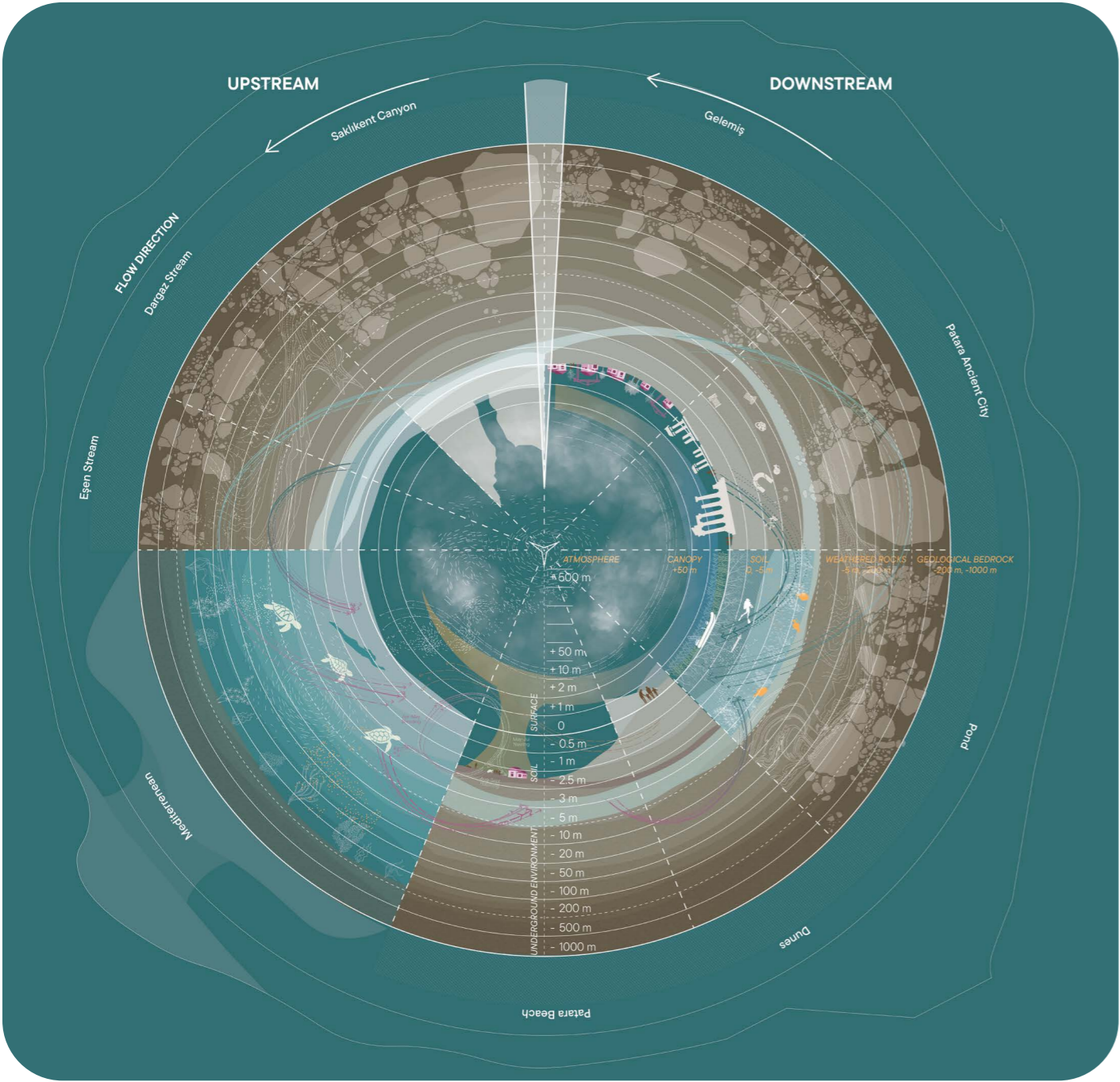
↑ **Drp. 4.3** Spatial Conflicts as a Produced Condition  
 By author, adapted and reinterpreted from the graphics by Susie Gibson for MRC and Airbus (2026). Light pollution are represented qualitatively based on field observation.

This map seals a definite conceptual shift by completely decentering the human as the elementary spatial reference. By linking turtle-centered spatial logic with carefully introduced human pressures, most particularly light pollution, the map illustrates that conflict at Patara is not coincidental but generated. Hatchling movement paths, nesting zones, and ecological thresholds are displayed first, setting up a species-centered spatial structure. Only after this structure is made legible are human conflicts introduced, disclosing points of friction where incompatible temporalities and spatial logics crash.

The restriction applied in this map is intentional. Roads, buildings, and infrastructure are not completely depicted; rather, conflict is illustrated via qualita-

tive gradients and atmospheric effects. This decision withstands the dominance of human artifacts typical of planning maps and prevents them from becoming the main narrative. Conflict here is not enclosed as a design issue to be resolved but as proof of a misalignment between human spatial practices and environmental life cycles. The map's aim is diagnostic and ethical: it makes clear the structural conditions that generate interspecies injustice without solving them too soon.

### Gaiagraphy of Patara: A Situated Critical Zone



- Salt Water
- Fresh Water w/ Little Oxygen (underground)
- Fresh Water w/ Oxygen (surface, young)
- Prevailing Wind Direction
- Sediment Movement Direction
- Nesting Movement
- Nesting Zone
- Light Pollution

↑ **Drg. 4.4** Gaiagraphy of Patara: A Situated Critical Zone  
 By author, adapted and reinterpreted from COGOW, 2026; Erginal et al., 2013; Hesp, 2002; Bird, 2008; Susie Gibson for MRC ;Airbus, 2026. Light pollution are represented qualitatively based on field observation.

The final integrated Gaiagraphy synthesizes the earlier maps into a compact but selective spatial narrative. It does not pursue to incorporate all data into a comprehensive analysis; rather, it deliberately layers only those elements crucial to sustain ecological depth, temporal multiplicity, and multispecies agency. Marine-coastal dynamics, turtle life cycles, sand movement, freshwater systems, and qualitative human pressures coexist within a lone graphic field, building a map that needs slow reading and interpretive action instead of immediate clarity.

This final map operates as the critical voice of the thesis. It does not provide solutions, masterplans, or strategic proposals. Its effectiveness lies strictly in withholding resolution. By preserving tension, over-

lap, and ambiguity, the Gaiagraphy opposes the closure typical of design outcomes and rather repositions mapping as an ethical and political act. It argues that before intervention, regulation, or design, there must be recognition of non-human agency, unequal temporalities, and the delicate negotiations that maintain life in the Critical Zone. In this way, the Gaiagraphy of Patara is not an endpoint, but a proposal to reconsider how spatial decision-making starts.



Fig. 5.1 Dunes at Patara Beach ©Adobe Stock

## Reflections & Discussions

This final chapter brings together the critical insights of the thesis by revisiting its central argument that interspecies injustice at Patara is not only produced via physical interventions but also through representational habits that decide how the landscape becomes legible in the first place. Instead of completing a design proposal, this chapter reflects on what the Gaiagraphy of Patara discloses about competing spatial logics, the political role of cartography, and the methodological implications of treating mapping as a critical stance. It discusses how the thesis repositioned *Caretta caretta*, sediment flows, and seasonal patterns as spatial organizers and reflects on the risks, limits, and future potential of Gaiagraphy as both a representational protocol and an ethical attitude within landscape practice.

## 5.1 Reflections

Studying Patara as a case study made clear that the core issue is not only between protection and development, or between tourism and ecology, but between competing spatial logics. Traditional cartography treats *Caretta caretta* as a conservation layer that is placed “on top” of a coastline defined by humans. However, once the sea turtle is approached as a spatial and temporal actor, the shoreline restructures: distances from the sea, dune morphology, moisture gradients, nocturnal movement, and seasonal patterns become primary, not secondary. This change did more than include ecological information; it shifted what the landscape *is* in graphical terms. A key reflection of this thesis is that interspecies justice begins with this kind of representational rearrangement, moving from humans as the reference point to a more-than-human geometry of the coast.

*Interspecies justice begins with this kind of representational rearrangement, moving from human as the reference point to a more-than-human geometry.*

A second reflection involves the role of “slowness” in the outcome. The final integrated Gaiagraphy rejects instant clarity. It requires slow reading, and it does not resolve tensions into a clear message. This can be misread as an aesthetic preference to the

casual eye. As a matter of fact, it is a political position: rejecting the idea that fast legibility is always a virtue, particularly when rapid legibility often depends on flattening processes into categories that suit human governance. The thesis thus treats opacity, layering, and careful omission as forms of care, which are methods that protect ecological entanglement from being degraded into managerial simplifications.

This also brought on a more personal methodological awareness: the mapmaker is never outside of the map. Decisions about what to obscure, what to omit, and what to foreground are not technical afterthoughts; they are where the thesis’ ethics become visible. Preferring not to let roads, buildings, and administrative boundaries dominate the graphical hierarchy is not dismissal of their existence; it is a refusal of their representational superiority. In traditional planning documents, these aspects often become the “truth” of the area, while non-human life becomes annotation. This study reverses that hierarchy, not to romanticize nature, but to disclose the political work that cartography already does.

Simultaneously, the thesis disclosed its own risks. On the one hand, the risk is aesthetic absorption: the possibility that Gaiagraphy is received as a beautiful visual artifact instead of a critical instrument. This is

the reason textual framing is not complementary; it is part of the method. On the other hand, the risk is over-asserting. Mapping can reposition visibility, but it does not automatically alter governance, enforcement, or economic pressures. The thesis thus stays with a cautious conclusion: representation cannot replace planning, but it can disrupt the defaults of planning by changing what becomes legible and debatable before intervention occurs.

*Representation cannot replace planning, but it can disrupt the defaults of planning by changing what becomes legible and debatable before intervention occurs.*

Ultimately, the study recommends a future direction that remains persistent with the thesis scope: developing Gaiagraphy as a repeatable protocol instead of a one-off style. The advantage of this approach is not only that it generates alternative images, but that it generates a disciplined practice of translation, determining measured from interpreted relations, treating time as layered instead of linear, and making representational choices responsible. If expanded, this could include systemic observation method to enhance qualitative layers, or comparative application to another nesting coast to test which aspects

are site-specific and which are methodological. But still without expansion, the thesis finishes with a clear position: at Patara, the primary intervention proposed is not a design strategy, but a critical re-thinking, an alternative way of seeing that repositions spatial decision-making toward interspecies justice.

## 5.2 Discussions

This thesis was formed to test a specific claim: that cartographic representation is not a neutral outcome of spatial analysis, but one of the main systems through which landscapes are made manageable and thus one of the places where anthropocentric bias becomes operational. Throughout the theoretical framework, anthropocentrism was framed as more than an ethical position; it was treated as a representational system grounded in abstraction, stabilization, and control. Within this system, maps frequently privilege fixed surfaces, administrative boundaries, and human schedules, while ecological processes and non-human temporalities are lowered to “layers” that seem optional or secondary.

The contextual analysis of Patara indicated that such graphical habits are especially inadequate in coastal territories. Patara is not a stable coastline but

a living marine-coastal continuum: sediment transport, dune migration, wind dynamics, fluvial input, and seasonal patterns co-produce the beach as an ever-adjusting interface. In this sense, the thesis claims that the “site” cannot be understood as a container for human activity plus ecological pressures. It is an assembly of interacting processes that forego and overrun human governance. That is the reason the thesis outcome had to be representational: if the problem starts with how the landscape becomes legible, then the outcome must intervene at that level instead of jumping toward design resolutions too soon.

The main contribution of Chapter 4 is methodological: the Gaiagraphy maps are positioned not as illustrations of earlier findings, but as the underlying argument of the thesis, which is a critical voice that repositions what counts as spatial knowledge. Instead of seeking comprehensive coverage, the mapping sequence builds a legible attitude. First, the marine-coastal ecosystem map positions Patara as a system formed by material flows instead of zoning logic. This is not merely “ecological mapping”; it challenges the default planning presumption that land parcels, access, and fixed coastlines are the basic units of logic. Second, the *Caretta caretta* temporal mapping presents

***Gaiagraphy is operative because it shifts the conditions under which spatial decisions become considerable.***

non-human time as a spatial organizer, demonstrating that the beach is not activated by a single human calendar but by multiple and uneven rhythms: nesting, incubation, and hatching rearrange coastal space periodically. Third, when species-centered space is parallel with carefully mapped human pressures, the thesis makes its sharpest point: conflict at Patara is systematically produced by unlike temporalities and representational priorities, not an unlucky coincidence. By sequencing the maps like this: ecological continuum → species time → produced conflict, the thesis refrains from the common weakness of “overlay conflict maps” that demonstrate everything at once but conceal causality.

This method also explains what the thesis means by being “operative” without becoming a design proposal. The maps do not assert to solve Patara’s conflicts through planning strategies. Rather, they argue something both sharper and more justifiable: Gaiagraphy is operative because it shifts the conditions under which spatial decisions become considerable. By

foregrounding critical-zone relations such as sand, wind, hydrology, seasonal patterns, and non-human agency, the maps decision-making frameworks that treat these dynamics as background or exceptions. Alias, the thesis does not provide a masterplan; it imposes any future masterplan to confront what it usually renders invisible.

A possible critique is that interpretive mapping weakens scientific rigor. This thesis discusses that by making a clear methodological division between measured and interpreted components. Where empirical datasets exist, they fix the maps. Where phenomena are relational, situational, or inadequately documented, the thesis uses gradients, thresholds, omission, and blurring as explicit graphical choices. Interpretation is not presented as a compromise; it is presented as methodological frankness. All mapping interprets. Conventional maps merely hide interpretation behind standardized visual authority. By making interpretation visible, the thesis makes the map responsible.

In conclusion, the study must also be read through its intentional limits. It is site-specific, and its transferability requires adaptation instead of replication. It does not claim ecological monitoring, simulations, or enforcement capacity. It rejects aestheticizing “complexity” for its own sake; rather, it uses density and

***“Who is allowed to organize space and time?”***

layered time to withstand the expectation that landscapes must be simplified to be actionable. Thus, the thesis positions interspecies justice as a spatial question, “Who is allowed to organize space and time?” and argues that representation is one of the first places where that question is settled.

## Chapter 6.



Fig. 6.1 Dunes at Patara Beach ©Adobe Stock

# Acknowledgements

I would like to express my sincere gratitude to the people who supported and accompanied me throughout this year. This thesis would not have been possible without their guidance, encouragement, and trust.

First and foremost, I would like to thank my supervisor, Pedro Nuno Campos da Costa, for his continuous dedication and intellectual guidance. Over the course of this year, he pushed me to question deeper, think sharper, and reach beyond what I thought I was capable of. His unique perspective on architecture and his ability to stimulate new ways of thinking significantly expanded my creativity and helped me discover the potential of my own critical voice.

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