UNDERSTANDING USER EXPERIENCE OF NATURE IN URBAN GREEN SPACES THROUGH BIOPHILIC DESIGN: THE CASE OF KARŞIYAKA

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by
Büşra ÜSTÜNDAĞ

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We approve the thesis of **Büşra ÜSTÜNDAĞ**

Examining Committee Members:

Prof. Dr. Koray VELİBEYOĞLU
Department of City and Regional Planning, İzmir Institute of Technology

Asst. Prof. Dr. Zeynep ELBURZ
Department of City and Regional Planning, İzmir Institute of Technology

Prof. Dr. Adnan KAPLAN
Department of Landscape Architecture, Ege University

19 July 2023

Prof. Dr. Koray VELİBEYOĞLU
Supervisor, Department of
City and Regional Planning,
İzmir Institute of Technology

Prof. Dr. Koray VELİBEYOĞLU
Head of the Department of
City and Regional Planning

Prof. Dr. Mehtap EANES
Dean of the Graduate School of
Engineering and Sciences

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ABSTRACT

UNDERSTANDING USER EXPERIENCE OF NATURE IN URBAN GREEN SPACES THROUGH BIOPHILIC DESIGN: THE CASE OF KARŞIYAKA

Increasing urbanization is reducing human interaction with the natural environment, creating negative consequences for both humans and nature. Since the majority of the human population lives in cities today, the nature experience mostly includes the urban nature experience. In this context, urban green spaces are among the main areas that allow people to interact with nature in their daily lives. Therefore, it is important to adopt design approaches that encourage people's nature experiences in the design of these areas. Biophilic design, which focuses on enhancing people's interactions with nature in the built environment, offers an opportunity in this context. This study focuses on understanding the user's experience of nature through biophilic design in the context of three neighborhood parks located in the Bostanlı neighborhood of Karşıyaka district of İzmir province.

In this study, nature experience is considered at two levels: the environmental level and the individual level. The spatial characteristics and nature experience potentials of three selected neighborhood parks were examined at the environmental level. To explore the individual level of nature experience, a nature experience workshop was conducted with seven participants residing in the Bostanlı neighborhood. For both levels, the experience-based framework of biophilic design was used as a theoretical framework. As a result of the analyses, it has been understood that the user's experience of nature in the use of urban green spaces in densely urbanized areas is affected by spatial characteristics as well as individual factors. Furthermore, the study findings indicate that the experience-based framework of biophilic design provides a useful framework for comprehending how users interact with nature in urban green spaces.

Keywords: *Biophilic design, nature experience, urban green space*

ÖZET

KENTSEL YEŞİL ALANLARDA BİYOFİLİK TASARIM ARACILIĞIYLA KULLANICI DOĞA DENEYİMİNİ ANLAMAK: KARŞIYAKA ÖRNEĞİ

Artan hızlı kentleşmenin etkisiyle insan ve doğa arasındaki etkileşim giderek azalmakta ve bu durum hem insanlar hem de doğa için olumsuz sonuçlar yaratmaktadır. Günümüzde insan nüfusunun büyük bir kısmı kentlerde yaşadığı için doğa deneyimi çoğunlukla kentsel doğa deneyimini kapsamaktadır. Bu kapsamda, kentsel yeşil alanlar insanların günlük yaşamlarında doğayla etkileşimde bulunmalarına olanak sağlayan başlıca alanlar arasında yer almaktadır. Dolayısıyla, bu alanların tasarımında insanların doğa deneyimlerini teşvik eden tasarım yaklaşımlarının benimsenmesi önem taşımaktadır. İnsanların yapılı çevrede doğayla etkileşimlerini geliştirmeye odaklanan biyofilik tasarım yaklaşımı kentlerde azalan doğa deneyiminin arttırılması için önemli bir fırsat sunmaktadır. Bu çalışma, İzmir ili Karşıyaka ilçesinin Bostanlı mahallesinde bulunan üç mahalle parkı kapsamında ve biyofilik tasarım çerçevesinde kullanıcı doğa deneyimini anlamaya odaklanmaktadır.

Çalışmada doğa deneyimi, çevresel seviye ve bireysel seviye olarak iki kapsamda ele alınmaktadır. Çevresel seviye kapsamında, seçilen üç mahalle parkının mekânsal karakteristikleri ve doğa deneyimi potansiyelleri incelenmiştir. Bireysel seviye için ise kullanıcıların seçilen parklardaki doğa deneyimlerinin anlaşılmasına yönelik Bostanlı mahallesinde yaşayan yedi katılımcının katılımıyla doğa deneyimi atölye çalışması gerçekleştirilmiştir. Belirtilen her iki seviye için de biyofilik tasarımın deneyime dayalı teorik çerçevesi kullanılmıştır. Çalışmadan elde edilen verilerin analizi sonucunda, kentleşmenin yoğun olduğu yerlerde kentsel yeşil alan kullanımında kullanıcı doğa deneyiminin bireysel faktörlerin yanı sıra mekânsal karakteristiklerden de etkilendiği anlaşılmıştır. Ayrıca, çalışma bulguları biyofilik tasarımın deneyime dayalı teorik çerçevesinin, kentsel yeşil alanlarda kullanıcıların doğa ile nasıl etkileşim kurduğunu anlamaya olanak sağladığını göstermektedir.

Anahtar kelimeler: *Biyofilik tasarım, doğa deneyimi, kentsel yeşil alan*

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UGS: Urban Green Spaces

CHAPTER 1

INTRODUCTION

1.1. Background of the Study

At the beginning of the long-standing human-nature relationship, humans had to interact with the natural world constantly due to their living conditions. However, this interaction has started to decrease gradually with the rapidly increasing urbanization. This diminishing interaction between humans and nature leads to the alienation of humans from nature, with negative consequences for both humans and nature. In other words, the loss of the experience of nature threatens the sustainability of common life for both humans and nature.

While early human interactions with nature included the experience of wild or pristine nature, this interaction mostly covers the urban nature experience today. In this context, urban green spaces (UGS) stand out as the main areas that allow nature experiences in cities. While UGS allow people to spend time in the natural environment, they also enable them to increase their connection with nature. Therefore, understanding the relationship between the use of UGS and the user's nature experience is important in terms of increasing the nature experience in these areas. In addition, it is essential to understand the influence of design approaches that encourage human interaction with nature on the user's experience of nature in these areas.

Biophilic design, which focuses on increasing people's interaction with nature in the built environment, is based on the biophilia hypothesis, which is defined as "the innate tendency to focus on life and lifelike processes" (Wilson 1984, 1). Although biophilia is defined as an inherent predisposition towards nature, it needs stimulation and development like other human predispositions (Kellert and Calabrese 2015). In this context, biophilic design offers a wide-ranging design framework for the stimulation and development of biophilia in the built environment. At this point, the experience-based framework of biophilic design—three experiences (direct experience of nature, indirect

experience of nature, and experience of space and place) —and the 25 attributes developed by Kellert (2018) offer an important opportunity to increase interaction with nature. While the direct experience of nature occurs through direct interaction with natural elements such as light, air, water, plants, and animals, the indirect experience of nature encourages people to interact indirectly with natural attributes such as colors, patterns, and textures (Kellert 2008; 2018). Lastly, the experience of space and place focuses on how site-specific attributes affect people's interaction with the place (Kellert 2018). Through these different interactions with nature, biophilic design allows people to derive positive benefits from their interactions, especially in terms of physical and mental health. More importantly, biophilic design promotes ecological and social harmony by facilitating communication and cooperation between humans and non-human beings (Kellert 2018).

The widespread use of the biophilic design approach in urban spaces, especially in UGS, provides an opportunity to increase people's interaction with nature in the built environment. However, despite this importance, a specific biophilic approach to UGS is rarely encountered in scientific studies (Tokhmehchian and Gharehbaglou 2019). There is also insufficient knowledge about how people's nature experiences relate to the design features of UGS. Therefore, there are still questions about to what extent the use of UGS affects the user's experience of nature. Consequently, understanding the extent to which the use of UGS affects the nature experience of the user in places where urbanization is intense is important in order to revive the nature experience that is declining in urban life. In this context, it is crucial to comprehend the interaction of the user with nature through their own expressions and concepts in terms of developing more sensitive and inclusive UGS (De Kleyn, Mumaw, and Corney 2019).

1.2. Aim of the Study

This study aims to understand the relationship between the use of UGS and the user's experience of nature in places where urbanization is intense by using the experience-based framework of biophilic design.
Accordingly, this study focuses on two research questions:

1) To what extent does the use of urban green space in places where urbanization is intense affect the user's experience of nature?
2) To what extent can the experience-based framework of biophilic design be effective in understanding the nature experience of the urban green space user in places where urbanization is intense?

Using the experience-based framework of biophilic design, this study aims to find answers to the aforementioned research questions as well as understand the nature experience potentials of the case study areas. Additionally, using the same framework, it aims to comprehend the park spatial characteristics that influence the user's experience of nature in these selected parks.

1.3. Methodology

As UGS is a broad concept, this study discusses the use of UGS in the context of neighborhood parks, where people can easily interact with nature in their daily lives. Therefore, the "nature experience" mentioned in the study refers to the urban nature experience. In this direction, three neighborhood parks—Adnan Saygun Park, Hıfzı Veldet Velidedeoğlu Park, and M. Senai Ertekin Park—located in the Bostanlı neighborhood of Karşıyaka district, which is one of the densely urbanized settlements in İzmir province, were selected as case study areas.

For this study, a case study approach was used, as qualitative research methods enable the understanding and exploration of people's emotions, perceptions, attitudes, and experiences (Kumar 2011). In the study, the nature experience is considered from two perspectives: the environmental level and the individual level. In this direction, the case

study was structured around two main parts: an examination of the spatial characteristics and nature experience potentials of the selected neighborhood parks and an understanding of the users' nature experiences in these parks.

In the first part, the spatial characteristics and nature experience potentials of the selected neighborhood parks were analyzed through site analysis and field observations. As the analysis framework for the nature experience potentials of the neighborhood parks in this step, the experience-based framework of biophilic design was used. In the second part, a nature experience workshop was carried out in the selected neighborhood parks to understand the users' nature experiences and the needs and motivations behind these experiences. Using Kellert's (2018) experience-based framework, the nature experience workshop was constructed in three steps. The workshop's general operation was provided by the nature experience activity cards and user observation reports that were prepared for this study. Besides, in order to gain a better understanding of the users' nature experience, an empathy map, one of the User Experience (UX) methods, was adapted for this study. The user empathy maps prepared as a result of this adaptation were used to understand the views of the participants on their nature experiences in the parks after the workshop activities were completed. Although there is no common agreement regarding the number of workshop participants, 6–12 people are recommended as a manageable group size (Brown 2022). In this direction, the nature experience workshop was held with the participation of seven participants living in the Bostanlı neighborhood.

In the analysis phase of the data obtained, thematic analysis, which provides a detailed description and a flexible approach in the analysis process of the data (Braun and Clarke 2006), was used. In this direction, using the MAXQDA software, Braun and Clarke's (2006) thematic analysis framework, which consists of six steps, was followed: familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. After thematic analysis, themes were extracted from the data set to figure out to what extent the nature experience potentials of the neighborhood parks affect the user's nature experience and to what extent these relate to the experience-based framework of biophilic design.

1.4. Structure of the Study

This study consists of six chapters. Chapter 1 includes background information, the aim of the study, and methodology. In Chapter 2, the changing definitions of nature and the developmental process of the relationship between the city and nature are examined. In addition, this chapter explains the concept of urban nature, which enables thinking about the city and nature together. Chapter 3 covers the declining experience of nature together with the factors that are effective in this situation and provides a general framework for the scope of the experience of nature. The chapter also examines urban green spaces, which play an important role in the experience of nature in cities, and the relationship between these spaces and the experience of nature. Chapter 4 includes the biophilia hypothesis on which biophilic design is based, the experience-based framework of biophilic design, and the various advantages it offers by promoting and enriching human-nature interaction. In Chapter 5, the general characteristics of the case study areas, the methodology adopted for this study, the data collection and analysis, the research findings, and the discussion are presented. Finally, Chapter 6 presents the study's conclusion.

CHAPTER 2

DEFINING NATURE

2.1. Definition of Nature

Defining "nature" is a major challenge for many disciplines, and there is no common definition for this concept (Lamb 1996). According to Williams (1976), "nature" is seen as one of the most complex words in the language. In view of the Western cultural and historical context, Nielsen (2004) examines nature with four distinctions. In this classification, "nature" means: (i) the physical whole, everything that makes up the world; (ii) anything that is not created by humans; (iii) the core of a thing or living thing; and (iv) what makes this world different from others (Nielsen 2004). Furthermore, while some definitions of nature in the literature refer to non-human elements like plants, animals, and physical processes, others also include human-made natural environments (Fretwell and Greig 2019). Depending on what nature includes, Kowarik's (2013) "Four Natures Approach" provides an overview of nature's scope. According to this approach, nature of the first kind includes wild or pristine landscapes that are untouched by humans; nature of the second kind consists of agricultural areas that are cultivated; nature of the third kind covers a variety of UGS, such as private gardens as well as parks and landscape parks; and nature of the fourth kind allows nature to develop spontaneously in cities and includes urban wilderness (Kowarik 2013). These classifications for the concept of nature give an idea of nature's definition and scope. However, in order to understand the concept clearly, it is necessary to look at its historical development. In other words, the uncertainty in the nature definition stems from the fact that the concept has a long historical background that has been affected by humans.

The idea that nature is an independent phenomenon, which was emphasized in the above-mentioned definitions, also subtly stresses a separation between nature and everything else created by human intervention, such as culture and history (Soper 1995). This understanding that nature and society are ontologically distinct from one another is

closely related to other Enlightenment and modernist dichotomies (e.g., nature/culture, human/non-human, subject/object, etc.) (Dyer 2008). Many situations, such as starting with the Enlightenment movement and moving on with the acceleration of developments in science and technology in the 19th century, were effective in deepening this understanding (Yaylı 2015). In addition to these, urbanization is also one of the main factors that have affected the alienation of humans from nature (Franklin 1999). As the rate of urbanization has gradually increased, human life has evolved in built environments away from nature. Thus, this alienation, which is based on the fact that humans see themselves as separate from nature, has become a fundamental part of social consciousness in Western culture (Srinivasan 2014).

The importance of nature, which referred to the essence of life at the beginning of the historical process, has changed over time with the changing conditions of human life. During this process, nature gradually moved away from the center of human life. However, humans dependence on nature from the beginning of history demonstrates that it is not possible to think of human life separately from nature. The main reason for this is that the intertwined relationship with nature affects the cognitive and emotional aspects of humans, and humanity has also occurred and developed over this period of time (Gullone 2000). Therefore, it is difficult to define nature without taking into consideration humans and their actions (Nielsen 2004). As Capra (1975, 69) states, "we can never speak about nature without, at the same time, speaking about ourselves."

2.2. City and Nature

Cities generally have been perceived as human inventions that exist in opposition to and apart from nature (Soens et al. 2019). However, the process of city emergence and development reflects an intertwined relationship with nature. Therefore, contrary to the city-nature dualism, it is hard to understand how these two concepts have changed over time without looking at how they relate to each other (Mumford 1956).

People lived in communities in temporary campsites and small villages for a long time during the period when cities were not yet developed (Smith 2002). In this period, some communities tried to survive by choosing natural areas such as caves and carved rock walls as their living spaces (Mumford 1956). These communities, which saw nature

as life itself, also saw themselves as a part of nature. However, communities' relationships with nature have been profoundly impacted by the changes in their social and cultural structures over time (Smith 2002).

Despite the increasing population with the emergence of the first cities in ancient Mesopotamia, the symbiotic relationship between the village and nature at the beginning did not change to a great extent (Mumford 1956). The cities of this period represented a more complex structure because of their size and the different units they contained, such as social, economic, and administrative, and because of these features, they were separated from the villages. Since agricultural lands were important in this period, cities were established in relatively small areas in order not to restrict them (Smith 2002). In addition, as the cities of this period represented a harmonious relationship with nature, the communities living in this period were in direct contact with nature (Taghvaee, Kamyar, and Moradi 2017). However, the cities that started to develop over time and the increasing population brought this relationship between the city and nature to a critical point. While the desire for city growth has put significant pressure on the use of natural resources, it has also deteriorated the city-nature symbiotic relationship (Mumford 1956).

Cities underwent significant change in the middle of the 18th century as a result of the effects of the industrial revolution. In this process, while old cities were expanded and new ones were established, the transition from agricultural civilization to urban civilization started with the effect of increasing technical development and population density (Mumford 1956). Furthermore, with the effects of industrialization and changing production practices, an understanding that prioritizes economic structure and growth has become widespread in cities. This understanding has significantly affected not only the new economic restructuring but also the ecological restructuring (Steinberg 1986). In this period, while growth was considered the basic condition of progress, the dominance of nature was also considered a prerequisite for urban development (Kaika 2005).

The effect of urbanization has reached a different dimension with industrialization (Soens et al. 2019). The connection between urbanization and the transformation of the natural environment has been established with the inclusion of the natural environment in the domain of urbanization (Benton-Short and Short 2008). In addition to the adverse effects of industrialization on the environment, a tremendous breakdown was seen in the city-nature relationship. During this period, focusing on industrial development encouraged the growth of urbanism, which was based on the excessive consumption of natural resources (Taghvaee, Kamyar, and Moradi 2017). However, this understanding

led to various environmental and social problems. In response to the problems caused by industrialization, new city movements that tried to integrate nature into cities emerged.

In early industrial cities, the emergence of problems such as air pollution, sanitation, and hygiene had a negative impact on living conditions. This situation facilitated the development of the park movement, which emerged at the beginning of the 19th century with the goal of addressing the unhealthy living conditions caused by the industrial revolution in the city. Through this movement, public parks used for recreation became widespread in the city. For instance, Central Park, designed by Frederick Law Olmsted and Calvert Vaux in 1858, was the most well-known example of the park movement in America. In this plan, the design concept aimed to keep people away from the noise of the city and the complexity of everyday life with the planting done in and around the park (Taylor 1999).

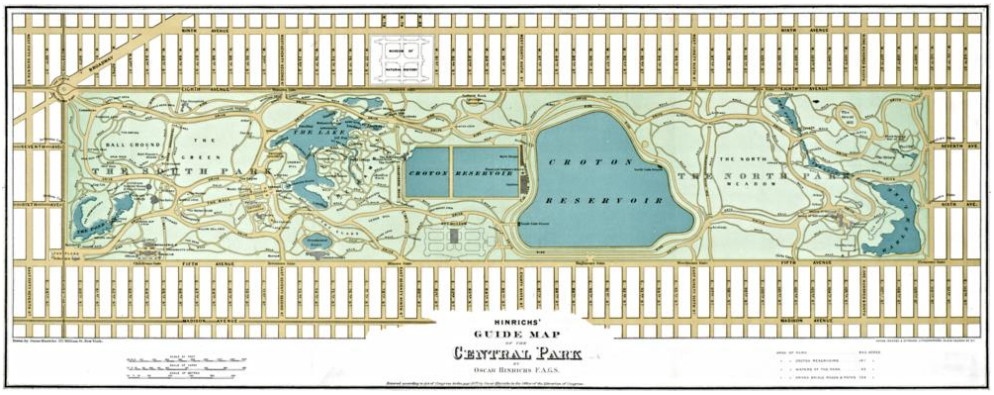

Figure 2. 1. A map of Central Park
(Source: Url 1)

The City Beautiful Movement, which is another important city movement emerging towards the end of the 19th century, made spatial interventions to increase the quality of life, which had decreased with the effect of industrialization in cities. The City Beautiful Movement claimed that the spatial solutions applied in the city with an understanding of beauty and aesthetics increase the quality of life and the loyalty of the citizens to the city. In this direction, various physical interventions of varying scales occurred in public spaces. These interventions included practices aimed at increasing the

beautiful and aesthetic aspects of the city, such as squares, monuments, fountains, parks, and tree plantings (Freestone 2019).

A more holistic solution to the problems caused by industrialization on a city scale was presented by Ebezener Howard in his book Garden Cities of To-Morrow (1902) with the concept of the garden city. The central claim of Howard's (1902) concept was that the best aspects of rural and urban life could be combined into a single whole. The garden city ideal divided the city, where six boulevards extend radially from a single center, into six equal housing units, and it also included squares, open spaces, and green areas. This concept's construction of city life in harmony with nature was seen as an important step in an environmentally friendly planning approach (Gatarić et al. 2019).

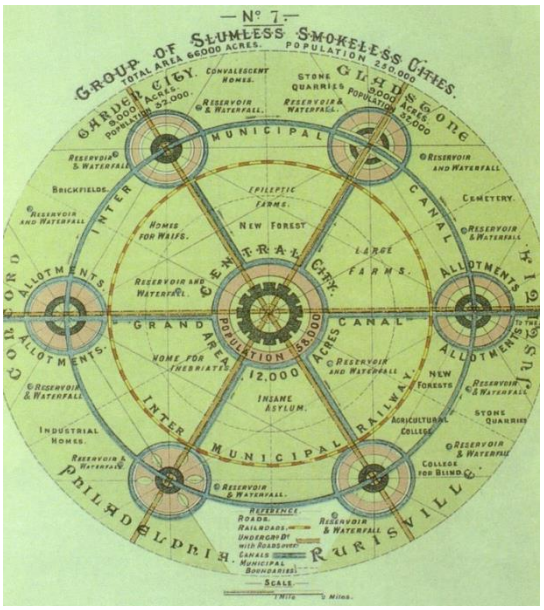

Figure 2. 2. Concept of the "Garden City" by Ebenezer Howard
(Source: Url 2)

In the 20th century, Le Corbusier and Frank Lloyd Wright, prominent names of modernism, emphasized the need for nature for a healthy lifestyle in modern cities (Kaika 2005). Ville Radieuse (the Radiant City), which Le Corbusier designed in the 1920s, is an example of this emphasis. Corbusier's unbuilt plan aimed to improve the quality of life by separating the empty spaces left by vertical architecture into UGS and common open spaces (Singh, Singh, and Avishek 2020). Besides, these green spaces were also seen as

places where sunbathing would be possible despite the presence of high-rise buildings (Erol and Özcan 2021). Another well-known example of how natural areas and city life can coexist is Broadacre City, which Frank Lloyd Wright designed in the 1930s. In the Broadacre City Plan, it is noteworthy that there are different types of green areas and that these areas are spread over a wide area together with residential areas, roads, and other functions. In this plan, Wright created a low-density suburban environment where green spaces are integrated into the built environment (Kaika 2005). In addition to these, Ian McHarg's "Design with Nature" (1969) book played a leading role in the development of environmental approaches that support the development of cities in harmony with nature.

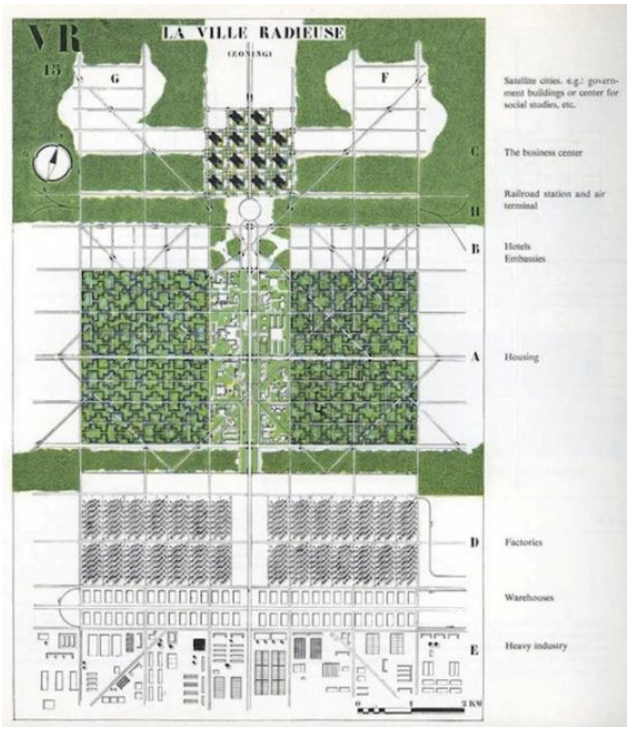

Figure 2. 3. Ville Radieuse (the Radiant City), Le Corbusier
(Source: Url 3)

Figure 2. 4. Broadacre City, Frank Lloyd Wright
(Source: Url 4)

Increasing environmental problems towards the end of the 20th century were considered to be inextricably linked to urban environments and social life (Kaika 2005). When environmental movements increased in the 1970s, the word "sustainability" was first used, and thereafter, interest in sustainable urban development developed throughout time (Yigitcanlar and Dizdaroglu 2015). The scope of sustainable and environmentally friendly urbanism approaches has become widespread thanks to technological advancements over time. Thus, various important urbanism approaches have emerged that seek to find a balance between the urban environment and the natural environment, such as green urbanism, biourbanism, biophilic cities, sustainable cities, eco-cities, and green cities (Tirla et al. 2014).

The relationship between nature and humans in 21st century cities has reached an extremely complex dimension (Culver 2014). In the Anthropocene era, which expresses the unprecedented impact of human intervention on the physical and natural environment, nature has begun to be seen not only as a materialistic resource but also as a source of increasing environmental crises (Kaika 2005). However, despite all these environmental problems, the ability of societies to transform the natural environment for their own benefit, with increasing technological innovations, places them in an advantageous position in this struggle against nature (Headrick 2020). Nevertheless, this so-called

advantageous position is not enough to reduce the vulnerability of 21st century cities to the environmental crises they are facing. Thus, this situation shows that the city not only represents a physical world but also has intertwined relationships with the natural world (Melosi 1993).

2.3. Urban Nature

Since the beginning of city formation, there has been a complex and intertwined relationship between the city and nature. However, despite this close relationship between them, the city/nature dichotomy, which is one of the common dualist ways of thinking, has existed for many years. While this understanding causes nature to be located in a place independent of humans, it also makes it difficult to think of nature in and together with the city. However, the fact that nature is an inclusive concept makes it possible to think of nature in the city together with the notion of "urban nature" (Kaplan 1983). Urban nature encompasses all natural elements found in urban spaces and provides habitat for many living species in the city. Furthermore, urban nature encompasses not only natural areas in the city that emerge as pristine or wilderness but also human-made natural areas. In other words, the term "urban nature" in the city has a wide scope, from pristine landscapes (e.g., fallow lands, wetlands, and forests) to UGS (e.g., parks, gardens, urban forests, etc.) (Breuste 2022).

While urban nature initially developed in areas such as private gardens, parks, or farmland, public space represented a "nature-free" space (Breuste 2022). However, this situation changed with the effects of the industrial revolution in the 19th century. The rapidly increasing population, combined with the effects of industrialization and the unhealthy conditions in the cities, caused the industrial cities to be defined as places away from nature and livability (Breuste 2022). After public green spaces were considered a part of the solution to the problems that arise in industrial cities, this situation began to change. Thus, the area of urban nature within the city started to expand. Additionally, urban movements, such as the Park Movement and the City Beautiful Movement, influenced the expansion of urban nature in the city.

The concept of urban nature has had an important place in the city, with different emphases throughout its development process. However, today's environmental crises

and increasing rapid urbanization pressure on natural areas in cities give more serious importance to this concept. The main reason for this is that urban nature is important not only in mitigating environmental crisis risks but also in increasing the diminishing experience of nature in the city (Kowarik 2018).

2.4. Summary

The complexity and comprehensiveness of the concept of nature make it difficult to come up with a common definition for it. Among the reasons for this ambiguity regarding the definition of nature is that the development of the concept has a long history. In this process, changes in environmental and social conditions have altered the significance and meaning of nature. Besides, throughout time, the development of cities and the socio-economic changes that affect the social structure in this process are also some of the important reasons that make this changing process dynamic. In addition, developments in cities have brought about discussions about not only the definition of nature but also about the city-nature relationship.

Discussions on the relationship between the city and nature have continued since the formation of cities. Although there was a harmonious relationship between the city and nature when cities were first established, this relationship has changed with the effects of changing conditions over time. However, the development of cities as physical settlements away from nature has caused serious problems in city life, such as air pollution, sanitation, and hygiene. After searching for solutions to these issues, urban planning approaches, including the park movement and the city beautiful movement, have emerged with the aim of harmoniously integrating the city and nature. Besides, the concept of urban nature played an important role in these approaches. Urban nature provides various social and environmental benefits for increasing the quality of life in cities. More importantly, it gives people a chance to get closer to nature and interact with it in the city.

CHAPTER 3

EXPERIENCE OF NATURE IN CITY

3.1. Extinction of Nature Experience

Rapidly increasing urbanization, changing production and consumption patterns, and technological advancements cause the experience of nature to decrease gradually (Clayton et al. 2016; Schweitzer, Glab, and Brymer 2018). This process is accelerated further by the fact that daily life habits in modern cities generally take place in built environments that do not provide adequate conditions for a nature experience. The threat of losing the experience of nature was defined by Pyle (1993) as the "extinction of experience" by emphasizing the decrease in direct interaction with nature. This loss of experience means that future generations may not have the same opportunities to interact with nature (Clayton et al. 2016). Therefore, this situation poses a common risk for both humans and nature by reducing the connection between humans and nature.

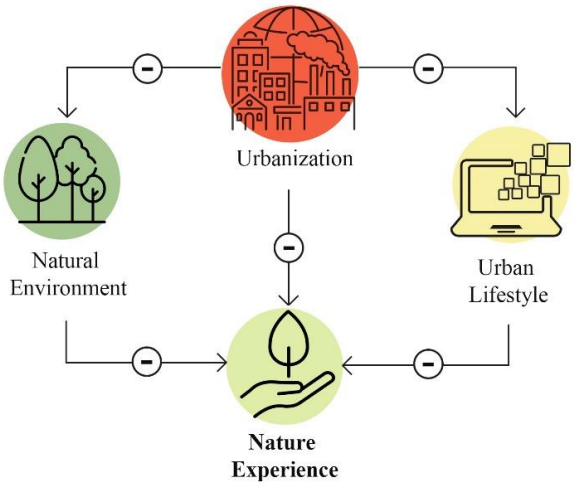

Figure 3. 1. The graphic summary of factors that negatively affect the nature experience (Source: Produced for this study)

The decrease in direct contact with nature and in time spent in nature is closely related to the decline in the nature experience (Gaston and Soga 2020). The nature experience mentioned includes not only the pristine or wild nature experience but also the urban nature experience (Soga and Gaston 2016). The reduction in the experience of nature has critical outcomes for both humans and nature. Many studies have shown that natural environments have a positive effect on people's mental and physical health (Bratman, Hamilton, and Daily 2012; Kaplan and Kaplan 1989; Shanahan et al. 2015; Ulrich 1993). Therefore, the decrease in nature experience causes negative effects (e.g., mental fatigue, negative emotions, stress, etc.) on human health. Additionally, this loss of experience makes people turn away from nature and lose interest in it (Gómez-Baggethun 2017). Accordingly, the emotional connection to nature is decreasing gradually (Soga and Gaston 2016). Besides, this alienation from nature is causing a decline in public support for nature conservation initiatives (Dean et al. 2019; Neuteleers and Deliège 2019; Gaston and Soga 2020). While this situation increases destructive interventions toward nature, such as habitat degradation and loss of biodiversity, it also makes cities vulnerable to environmental crises.

In recent years, there has been an increase in interest in studies to improve nature experiences in cities, especially as a result of the impact of growing environmental crises and the COVID-19 pandemic. Furthermore, the contribution of the experience of nature to the quality of urban life also encourages initiatives for the protection and development of natural areas (Oh et al. 2020). In addition, studies in this field support raising awareness efforts as well as developing management and planning strategies that aim to integrate social and ecological dimensions (Clayton et al. 2016).

3.2. Experience of Nature

Experience is defined by the Cambridge Dictionary as “(the process of getting) knowledge or skill from doing, seeing, or feeling things or something that happens to you that affects how you feel.” A wide range of values can influence experience, including those that are individual, cultural, social, and historical (Fox 2008). From this point of view, the experience of nature can be interpreted as the change that occurs at the individual level according to the personal meaning process as a result of the interaction

with nature. Furthermore, this definition may change depending on the characteristics of nature and the individual experiencing it (Clayton et al. 2016).

Since the evolutionary process, humans have interacted with the natural environment in a variety of ways. In the literature, there are theoretical studies to understand these interactions of humans with the natural environment. These studies can be examined within the scope of environmental preference theories and psycho-evolutionary theories. In this context, environmental preference theories basically refer to people's past experiences in the evolution process. These theories mainly state that humans prefer natural environments as they have an inherent tendency towards nature (Wilson 1984) and that humans have a predisposition towards environments with similar characteristics (e.g., large trees, water sources, etc.) because savanna environments provided the necessary environmental conditions for humans during evolution (Orians 1980). On the other hand, psycho-evolutionary theories focus on cognitive processes that affect people's environmental preferences. These theories state that unthreatened natural environments have a high restoration potential, which helps to regenerate and repair the decrease in attention capacity resulting from mental fatigue (Kaplan and Kaplan 1989) and that natural environments help people reduce negative emotions such as stress (Ulrich 1983). Briefly, these theories, which provide an understanding of the theoretical framework of nature experience, state that natural environments are effective in influencing people's environmental preferences and that interaction with these environments positively affects people's cognitive and emotional responses.

The nature experience can take place in many different places. The opportunity to experience nature can be found in pristine or wild natural areas, UGS, and even more examples like street trees. However, nature experiences today encompass largely urban nature experiences alongside wilderness or pristine nature experiences (Clayton and Opotow 2003). The characteristics of the natural environment being experienced can influence the nature experience, but the characteristics of the individual experiencing nature also play a crucial role. In this context, the experience of nature can be examined within the scope of objective nature and subjective nature experience. Accordingly, the concept of an objective nature is related to the characteristics of nature, such as vegetation, biodiversity, and aesthetic quality, while the subjective nature experience is influenced by a variety of individual characteristics, including demographic and socio-cultural factors (Hoyle 2020).

Nature interaction is required for the nature experience (Gaston and Soga 2020). In the nature experience, direct interaction with nature (e.g., bird song, the smell of flowers, etc.) or indirect interaction with nature (e.g., nature images and videos) can be effective (Hartig et al. 2014). On the other hand, Keniger and her colleagues used a triadic framework to explain how people interact with nature: indirect, incidental, and intentional interaction. (i) Indirect interaction describes a person's experience of nature when they are not physically present in it (e.g., watching a nature photograph or observing nature from a window); (ii) Incidental interaction is the experience of encountering a natural element during an activity that takes place physically (e.g., a tree or animal encountered while walking); and (iii) Intentional interaction includes the interaction that occurs as a result of a direct experience with nature (e.g., farming and camping) (Keniger et al. 2013).

Kellert (2002) also defined a triple framework for the experience of nature—direct, indirect, and vicarious or symbolic. (i) Direct experience includes physical and organic interactions with non-human beings (e.g., seeing animals, hearing water sounds) in natural environments without human intervention; (ii) Indirect experience covers physical interaction with nature and non-human beings in areas created by human intervention (e.g., botanic garden, zoo, aquarium); and (iii) Vicarious or symbolic experience takes place through associations with the natural world (e.g., nature photos and videos) without physical contact with the natural world (Kellert 2002). Consequently, these studies of the nature experience provide a general perspective on how nature experiences can take place in both the natural environment and the built environment.

In addition to these, the experience of nature has a number of significant benefits (Table 3.1).

Table 3. 1. The benefits of nature experience

Benefits	**Reference**
Life satisfaction	*Biedenweg, Scott, and Scott 2017; Chang et al. 2020*
Social interaction	*Goldy and Piff 2020; Hartig et al. 2014*
Well-being	*Fuller et al. 2007; Whitburn, Linklater, and Milfont 2018; Zamora et al. 2021*
Mental fatigue	*Berman, Jonides, and Kaplan 2008; Berto 2005; Kaplan and Kaplan 1989*

(cont. on the next page)

Table 3. 1. (cont.)

Stress	*Chang and Chen 2005; Hunter, Gillespie, and Chen 2019; Ulrich et al. 1991*
Environmental attitudes and pro-environmental behavior	*Miller 2005; Whitburn, Linklater, and Milfont 2018; Colléony, White, and Shwartz 2019; Richardson et al. 2020*

The nature experience encompasses not only benefits for humans but also benefits for nature. For example, the relationship between nature experience and pro-environmental behaviors (Soga and Gaston 2016) also supports the development of conservation approaches towards nature, such as the protection of natural areas and biodiversity (Rosa and Collado 2019). In other words, the feeling of closeness to nature that occurs as a result of nature experience is interpreted as an effective situation in the development of the nature protection instinct (Kellert 1993).

3.3. Urban Green Spaces

Today, the majority of the human population lives in cities and spends a large amount of their time in built environments. In their daily lives, people engage with nature in a variety of ways, either directly or indirectly (Cox et al. 2017). UGS are among the main spaces that allow for a nature experience in cities. UGS can be defined as urban areas partially or completely covered with vegetation (e.g., grass, trees, etc.) (De Haas, Hassink, and Stuiver 2021). UGS include both public and private green spaces, offering users either direct or indirect use of these spaces (Rodenburg, van Leeuwen, and Nijkamp 2002). Moreover, UGS vary according to characteristics, such as size, function, and location, and this creates a rich diversity. This diversity covers a number of green spaces, such as urban parks, community gardens, grasslands, and residential gardens.

UGS differ from each other according to many features, such as their functions, uses, and sizes. Moreover, UGS vary according to their location and the socio-economic, social, and cultural values of the country where they are located. Therefore, the classification of these areas also varies from country to country (Huang et al. 2017; Nor

and Abdullah 2019). Due to these differences, there is no widely accepted classification study to categorize UGS. However, there are various studies on the classification of UGS in the literature. These classifications can vary depending on several factors, such as their size, usage function, spatial characteristics, and property status (Byrne and Sipe 2010; Bilgili and Gökyer 2012).

Gül and Küçük (2001) categorized UGS into three categories based on their use or property situation: public, semi-private, and private spaces. Public green spaces are green areas open to everyone, such as city and neighborhood parks, urban forests, sports fields, and botanical gardens. Semi-private green spaces include green spaces that are not open to all users of society, such as schools and military areas, and are generally open to employees of institutions and organizations. Lastly, private green spaces are those that cover privately owned areas such as residential gardens and are used only by their owners (Gül and Küçük 2001).

According to Gül et al. (2020), UGS can be classified according to their use and can be divided into active green spaces and passive green spaces. Accordingly, active green spaces are used for recreational activities and include green areas such as city parks, neighborhood parks, sports fields, and playgrounds, which are open to the direct and active use of the public for various purposes. Passive green spaces, on the other hand, include public or privately owned areas that are publicly available to everyone but whose use is limited or not open to the public. For instance, cemeteries, state forests, and wooded areas can be evaluated within passive green spaces (Gül et al. 2020).

Based on their uses and functions, UGS can also be classified into four types: urban level green spaces, district level green spaces, neighborhood level green spaces, and residential level green spaces (Yıldızcı 1982 as cited in Önder and Polat 2012). Accordingly, residential level-green spaces, which constitute the smallest unit of green areas, include residential gardens, roofs, terraces, and balcony gardens. Neighborhood-level green spaces cover a maximum area of 15 hectares and include sports fields and playgrounds, as well as public housing gardens. District-level green spaces comprise an area of at least 15 hectares and include sports fields, playgrounds, and schoolyards. Lastly, the urban level-green spaces, serving the whole city, cover an area of at least 135 hectares. City parks, sports complexes, recreational areas, zoos, botanical gardens, and urban forests are examples of urban level-green spaces (Yıldızcı 1982 as cited in Önder and Polat 2012).

UGS provide a range of ecosystem services as well as important social, environmental, and economic benefits (Table 3.2).

Table 3. 2. The benefits of urban green spaces

Benefits		**Reference**
Social benefits	Physical activities	*Bedimo-Rung, Mowen, and Cohen 2005*
	Leisure and recreational activities	*Žlender and Gemin 2020*
	Social communication and interaction	*Maas et al. 2009; Zhou and Rana 2012; Sangwan et al. 2022*
	Well-being	*Bertram and Rehdanz 2015; Lee, Jordan, and Horsley 2015; Dushkova et al. 2021*
Environmental benefits	Air quality	*Rakhshandehroo et al. 2017*
	Noise reduction	*Dushkova et al. 2021*
	Carbon sequestration	*Hostetler and Escobedo 2010*
	Biodiversity	*Threlfall et al. 2017*
	Cooling effect	*Xiao et al. 2018*
Economic benefits	Environmental financial management	*Zhang et al. 2012*
	Financial management of the natural resource usage	*Van Zoest and Hopman 2014*
	Management of the community's annual health costs	*Terrapin Bright Green 2012*

Consequently, all these benefits of UGS also show that these spaces have significant importance for healthy and livable cities (Dizdaroglu 2021). Therefore, today

many urbanism approaches support living in harmony with nature, and they emphasize the value of UGS. Besides, considering UGS as an important complement to sustainable development strengthens this emphasis (Haq 2011).

3.4. The Relationship Between Nature Experience and Urban Green Spaces

While the human population living in cities is significantly increasing, it also causes increased concerns about human life moving away from nature (Shanahan et al. 2015). The concept of "urban nature" plays an important role in encouraging the experience of nature in cities, where access to nature is more limited than in rural areas. Therefore, it is critical to conduct research on how to develop the nature experience potential of urban natural areas.

UGS are the important areas where people encounter nature in cities. In other words, UGS are one of the main areas that allow people to interact with nature in their daily lives and benefit from the physical and psychological advantages of this interaction (Fuller et al. 2007). As stated before, although there is no common classification study for UGS, various green areas such as urban parks, urban forests, and urban gardens are included in this scope. Among these, parks especially have an encouraging role in interacting with nature in urban life (Razak, Othman, and Nazir 2016; Song, Richards, and Tan 2020; Yilmaz and Isinkaralar 2021). One of the factors that diminishes the experience of nature in urban life is that people cannot easily interact with nature. Therefore, the availability of green spaces, such as neighborhood parks, that people can easily reach in their daily lives is important for interaction with nature (Soga and Gaston 2016). In other words, it is important to keep and improve the places close to people's homes where they can interact with nature (Shanahan et al. 2017).

As stated before, different types of interaction, such as direct, indirect, incidental, and intentional, are effective in the nature experience (Kellert 2002; Keniger et al. 2013). Besides, various individual and environmental factors influence these interactions. Individual factors such as gender, age, socioeconomic status, family values, and nature orientation influence the nature experience (Oh et al. 2021; Soga et al. 2018). In addition

to these, time spent in nature, nature exposure, types of environment, sensory interaction (e.g., visual, auditory, etc.), and frequency of visits also affect nature interaction and nature experience (Bratman, Hamilton, and Daily 2012; Frumkin et al. 2017). When the nature experience in the UGS is evaluated in terms of environmental factors, the spatial characteristics of the UGS influence the individual's nature experience. As UGS is a comprehensive term, this situation also differentiates the quantitative and qualitative values of green spaces from each other. Therefore, while this situation influences the user's experience of green space, it also affects the user's nature experience, either directly or indirectly. In this context, users' experiences in the UGS are influenced by a variety of spatial characteristics, including the UGS' size, accessibility, function, design, maintenance, management, vegetation, open green space, and a water feature (Dempsey 2012; Zhang and Zhou 2018).

The use of some natural elements in UGS affects the attraction of the space and also the frequency of visitation. For instance, increasing the number of trees and using natural elements such as the water element and bright flowers can play a role in enhancing the aesthetic experience of green space (Wang et al. 2019). Besides, these natural features not only provide an aesthetic experience but also enable people to connect with nature. In the study by Maurer and her colleagues, trees were cited by visitors as an important park element that contributed to connectedness to nature (Maurer et al. 2021). In another study, participants stated that environments with sufficient trees and green spaces positively affect park visits, and natural features provide an opportunity to connect with nature (Rivera et al. 2021). The study by Wilkie and Stavridou (2013) also demonstrates that the use of natural elements, such as water sources, by creating favorable conditions and the natural scenes that result play a role in encouraging nature experiences. In summary, how people interact with nature is affected by several individual and spatial factors in UGS. Therefore, it is important to investigate such differences and develop local practices that encourage users' nature experiences in these spaces (Oh et al. 2021).

3.5. Summary

Humans have interacted with nature for a long time. This interaction can also be seen as a prerequisite for the nature experience. In this regard, the nature experience can

be interpreted as an individual change that occurs as a result of interaction with nature. However, rapidly increasing urbanization and changing daily life habits cause this experience to decrease gradually. Today, the fact that life activities are concentrated in cities causes the experience of nature to take place in urban nature rather than rural or wild nature. In this context, UGS are among the main areas that allow people to experience nature in urban life. Although there is no commonly accepted classification of UGS, there are studies in the literature based on various criteria such as size, use, function, and property status. In the scope of this study, Yıldızcı's (1982) classification study of UGS based on their functions was adopted. Accordingly, the use of UGS was examined within the scope of neighborhood parks, which provide people with easy interaction with nature in their daily lives.

Since the nature experience occurs between the person experiencing nature and the nature experienced, it is influenced by the factors that affect both the individual and the natural environment. In this regard, various individual factors such as age, gender, socioeconomic status, family values, and nature orientation influence the nature experience. Besides, when this experience is evaluated in UGS, various criteria such as accessibility, size, vegetation, natural elements, function, and management affect the user's nature experience directly or indirectly. In summary, nature experience is affected by various individual and spatial factors. Therefore, it is important to consider both individual and spatial characteristics when establishing a relationship between UGS and the user's experience of nature.

CHAPTER 4

RECONNECTING WITH NATURE: BIOPHILIC DESIGN

4.1. Biophilia Hypothesis

Humans and nature have a long-standing relationship that has developed over time. In the literature, this type of relationship is discussed from different perspectives, especially in the fields of psychology, sociology, and biology. From a psychological perspective, humans' closeness to nature was coined by German psychologist Eric Fromm with the concept of "biophilia," which is derived from the Greek words "bio" (life) and "philia" (love) and defined as "the passionate love of life and of all that is alive." (Fromm 1973, 365). According to Fromm (1964), biophilia, beyond representing a single feature, includes a holistic orientation that manifests itself in the emotions, thoughts, and experiences that make up human existence and is common to all living things.

The emergence of the concept of biophilia has initiated an important process of questioning to understand the human relationship with nature. Besides, the definition of the concept of biophilia in a period when people's destructive attitudes towards nature intensified was seen as an important opportunity for the development of this concept to improve people's attitudes towards nature and to establish a new relationship that has an ethical responsibility (Gunderson 2014). However, there are some prerequisites for the development of biophilia, and environments that provide adequate environmental and social conditions have a priority among these (Fromm 1964).

Although biophilia was first introduced by Fromm, the concept was developed as the biophilia hypothesis and became widespread after being defined as "the innate tendency to focus on life and lifelike processes" by American biologist E. O. Wilson (Wilson 1984, 1). From the perspective of biology, Wilson (1993) considers the concept of biophilia "not a single instinct but a complex of learning rules" within the framework of adaptive behaviors that emerged in the evolutionary process and developed in this process. Furthermore, Wilson (1993) defines the development of biophilia in this process

as a biocultural evolution that takes place under the influence of culture. In simple terms, the biophilia hypothesis focuses on understanding the motivation of humans to relate to nature by considering this evolution (Lumber, Richardson, and Sheffield 2017).

Throughout the development process of humanity, humans have interacted with nature in various ways, including physical, perceptual, and cognitive (Soga and Gaston 2015). These various types of interactions between human life and nature have had a significant impact on human emotional and cognitive development (Gullone 2000). This emotional aspect of this relationship is rooted in the concept of biophilia, and the biophilia hypothesis states that human life is somehow dependent on nature. Furthermore, this dependency considers nature not only as a material resource but also as a source of emotional, cognitive, aesthetic, and even spiritual development (Kellert 1993).

Table 4. 1. The nine values of biophilia
(Source: Adapted from Kellert 1993)

Utilitarian: Considering nature as a physical resource
Naturalistic: The feelings of satisfaction, fascination, and curiosity towards nature
Ecologistic-Scientific: Examination and research of nature
Aesthetic: The feeling of appreciation for the beauty of nature
Symbolic: Nature as a symbolic resource for the development of language and communication
Humanistic: Emotional attachment to nature
Moralistic: Ethical responsibility and respect for nature
Dominionistic: The desire to dominate and control nature
Negativistic: Feelings of fear, reluctance, and antipathy towards nature

Kellert (1993) defined nine biophilia values (Table 4.1) that describe humans' different relationships with nature as utilitarian, naturalistic, ecologistic-scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, and negativistic valuations. Furthermore, these values are defined as learning rules, and they evaluate humans' relationship with nature in terms of physical, emotional, and intellectual expression (Gullone 2000).

4.2. Biophilic Design

Biophilic design is based on the biophilia hypothesis, defined as an inherent tendency towards nature. However, biophilia indicates a "weak" biological tendency and requires stimulation to become stronger (Kellert 2008, 4). Therefore, just like other human tendencies, the biophilic tendency must constantly evolve in order to be continuous and effective (Kellert and Calabrese 2015). Nevertheless, the insufficiency of natural stimuli in the built environment does not support the development of humans' biophilic tendencies (Barbiero 2011; Kellert 2018).

The biophilic design approach was introduced by social ecology professor Stephen Kellert (2008) as a new framework to address the built environment's deficiencies in providing an experience of nature. The main purpose of this design approach is to encourage human interaction with nature by integrating natural elements into the built environment (Kellert 2008). Biophilic design differs from other sustainable and low-environmental impact design approaches. While these approaches generally focus on mitigating the negative environmental impacts of built environment interventions, biophilic design focuses on improving the physical and mental health of humans by increasing their interaction with nature in the built environment (Kellert 2018).

Kellert (2008) defined the dimensions, elements, and attributes of biophilic design, introducing two dimensions, six elements, and over 70 biophilic design attributes within this context. This framework, which is considered the basis of biophilic design, provides designers with a wide range of options to integrate natural elements suitable for different built environments (Kellert 2018). Later, Kellert and Calabrese (2015) defined the three experiences and 24 attributes for the practice of biophilic design, and this experience-based framework was updated by Kellert (2018). Additionally, numerous studies (Table 4.2) have since updated the biophilic design framework (e.g., Browning and Ryan 2020).

Table 4. 2. Theoretical frameworks of biophilic design
(Source: Adapted from Kellert 2008; 2018; Browning and Ryan 2020)

2 Dimensions, 6 Elements and 72 Attributes of Biophilic Design (Kellert 2008)					
I. Organic or Naturalistic				**II. Place-based or Vernacular**	
1. Environmental features	**2. Natural shapes and forms**	**3. Natural patterns and processes**	**4. Light and space**	**5. Place-based relationships**	**6. Evolved human-nature relationships**
- Color - Water - Air - Sunlight - Plants - Animals - Natural materials - Views and vistas - Facade greening - Geology and landscape - Habitats and ecosystems - Fire	- Botanical motifs - Tree and columnar supports - Animal (mainly vertebrate) motifs - Shells and spirals - Egg, oval, and tubular forms - Arches, vaults, domes - Shapes resisting straight lines and right angles - Simulation of natural features - Biomorphy - Geomorphology - Biomimicry	- Sensory variability - Information richness - Age, change, and the patina of time - Growth and efflorescence - Central focal point - Patterned wholes - Bounded spaces - Transitional spaces - Linked series and chains - Integration of parts to wholes - Complementary contrasts - Dynamic balance and tension - Fractals - Hierarchically organized ratios and scales	- Natural light - Filtered and diffused light - Light and shadow - Reflected light - Light pools - Warm light - Light as shape and form - Spaciousness - Spatial variability - Space as shape and form - Spatial harmony - Inside-outside spaces	- Geographic connection to place - Historic connection to place - Ecological connection to place - Cultural connection to place - Indigenous materials - Landscape orientation - Landscape features that define building form - Landscape ecology - Integration of culture and ecology - Spirit of place - Avoiding placelessness	- Prospect and refuge - Order and complexity - Curiosity and enticement - Change and metamorphosis - Security and protection - Mastery and control - Affection and attachment - Exploration and discovery - Information and cognition - Fear and awe - Reverence and spirituality
3 Experiences and 25 Attributes of Biophilic Design (Kellert 2018)					
1. Direct Experience of Nature		**2. Indirect Experience of Nature**		**3. Experience of Space and Place**	
- Light - Air - Water - Plants - Animals - Landscapes - Weather - Views - Fire		- Images - Materials - Texture - Color - Shapes and forms - Information richness - Change, age and the patina of time - Natural geometries - Simulated natural light and air - Biomimicry		- Prospect and refuge - Organized complexity - Mobility - Transitional spaces - Place - Integrating parts to create wholes	
3 Categories and 15 Patterns of Biophilic Design (Browning and Ryan 2020)					
1. Nature in the Space		**2. Natural Analogues**		**3. Nature of the Space**	
- Visual Connection with Nature - Non-Visual Connection with Nature - Non-Rhythmic Sensory Stimuli - Thermal & Airflow Variability - Presence of Water - Dynamic & Diffuse Light - Connection with Natural Systems		- Biomorphic Forms & Patterns - Material Connection with Nature - Complexity & Order		- Prospect - Refuge - Mystery - Risk/Peril - Awe	

The identification of a wide range of natural elements related to biophilic design provides an opportunity to consider access to nature in a broader context. Beatley's (2016) definition of the biophilic city, which is based on the understanding that nature exists at all scales, supports this. In addition, Beatley's (2011) study by evaluating biophilic design within the scope of urban planning and design (Figure 4.1) provides a general view toward integrating nature into the built environment with different scales and tools. From this point of view, biophilic design can be considered alongside planning and design decisions at various scales, including city and regional, neighborhood, and street (Öztürk 2021). In addition, the fact that biophilic design can be applied not only to new areas but also to existing areas (Hady 2021) makes it possible to extend the practice of biophilic

design. Therefore, biophilic design provides an important opportunity to consider access to nature within the city more holistically.

Figure 4. 1. The scales and elements of biophilic design
(Source: Adapted from Beatley 2011)

Numerous benefits arise from turning cities into environments where people can coexist harmoniously with nature. Biophilic design plays an important role in this, focusing on providing these benefits for both people and nature. According to Kellert

(2018), the success of biophilic design depends on it equally benefiting humans and nature. Therefore, biophilic design can contribute to fostering the human-nature connection to benefit both humans and nature (Andreucci et al. 2021).

4.3. Experiences and Attributes of Biophilic Design

As this study focuses on the nature experience, biophilic design is examined within the context of Kellert's (2018) experience-based framework, which consists of three experiences—direct experience of nature, indirect experience of nature, and experience of space and place—and 25 attributes.

Direct Experience of Nature	Indirect Experience of Nature	Experience of Space and Place
- Light - Air - Water - Plants - Animals - Landscapes - Weather - Views - Fire	- Images - Materials - Texture - Color - Shapes and forms - Information richness - Change, age and the patina of time - Natural geometries - Simulated natural light and air - Biomimicry	- Prospect and refuge - Organized complexity - Mobility - Transitional spaces - Place - Integrating parts to create wholes

Figure 4. 2. Experiences and attributes of biophilic design
(Source: Adapted from Kellert 2018)

4.3.1. Direct Experience of Nature

The experience of nature takes place in many different ways. The most widely known of these is the direct experience of nature. Direct experience of nature occurs through direct interaction with natural elements including light, air, water, plants, animals, and fire (Kellert and Calabrese 2015; Kellert 2018). Moreover, the direct experience of nature, which is one of the basic components of biophilic design, enables

direct contact with nature through the senses, allowing biophilic effects to be felt intensely (Beatley 2016).

4.3.1.1. Light

The use of natural light, which is seen as a fundamental element in shaping space, significantly affects the interaction between people and the environment (Ozorhon and Uraz 2014). The natural light experience allows people to interact with the environment and orient themselves in different ways, such as biologically (e.g., circadian rhythm) and physically (e.g., movement and direction finding), according to these interactions (Kellert 2018). Furthermore, experiencing natural light contributes to humans' mental health, well-being, and productivity (Kellert and Calabrese 2015).

Figure 4. 3. Merzig Park, Germany
(Source: Url 5)

The use of artificial light mimicking natural light in urban spaces can also play an effective role in stimulating biophilia. Additionally, lighting in UGS can help support biodiversity and encourage space utilization (Hiort-Lorenzen et al. 2018).

4.3.1.2. Air

Natural ventilation is one of the features that affect the use of the built environment. Changes in environmental factors like airflow, temperature, and humidity in the space can affect natural ventilation (Kellert and Calabrese 2015). Design elements such as site design, site location, and building form are also effective in these changes (Yang and Clements-Croome 2013). Furthermore, air movements also play a decisive role in natural ventilation, and senses such as feeling and smell can help people experience these movements (Kellert 2018).

Figure 4. 4. Urban Park Micro Renovation, China
(Source: Url 6)

4.3.1.3. Water

The interaction with water, which is the main source of life, has positive effects for people. These include reducing stress, increasing performance, productivity, and creativity (Kellert 2018). Additionally, the water element contributes aesthetically to the space, attracting attention and increasing the value of the space (Langie, Rybak-Niedziółka, and Hubačíková 2022). Interaction with water in urban life can be provided by natural water resources such as the sea, streams, and wetlands (Kellert and Calabrese

2015). In addition to natural water sources, this interaction can be realized with various artificial water elements such as fountains and pools (Langie, Rybak-Niedziółka, and Hubačíková 2022).

Figure 4. 5. Greenacre Park, New York
(Source: Url 7)

4.3.1.4. Plants

Humans need contact with plants and other natural elements (Alexander, Ishikawa, and Silverstein 1977). Plants enhance the aesthetic value of the space by creating a visual effect with their colors, forms, and textures (Hansen and Alvarez 2010). Moreover, plants are frequently preferred in design decisions because they have a wide range of uses and provide direct contact between humans and nature (Kellert 2018). In this context, it is critical to consider the locality, diversity, and density of plants when using them (Kellert and Calabrese 2015).

Figure 4. 6. High Line, New York
(Source: Url 8)

4.3.1.5. Animals

In modern cities, it is necessary to increase the areas that provide human-animal interaction. At this point, connecting areas of different scales, such as greenways, green spaces, and green streets, can be used to create a space for both domestic and wild animals (Alexander, Ishikawa, and Silverstein 1977). In addition to these, people's encounters with animals in the city can be ensured by various design strategies such as green roofs, planting, and birdhouses (Kellert and Calabrese 2015). However, design strategies involving animals need to be ethically appropriate, and environmental criteria such as vegetation, soil, and water use must be taken into account (Kellert 2018).

Figure 4. 7. Insect Hotel, Helsinki
(Source: Url 9)

4.3.1.6. Landscapes

Since the landscape features of some environments are similar to the environmental features that play a role in the evolution process, the preferability of these environments is higher than that of other environments (Orians and Heerwagen 1992). In these preferences, characteristics such as an open landscape, plant species, prospect, and refuge are effective (Appleton 1975; Heerwagen and Orians 1993). In addition, environments that have holistic ecosystem functions also positively affect landscape preferences (Kellert 2018; Kellert and Calabrese 2015). In order to provide these effects, designed natural spaces (e.g., wetlands and microforests) can be integrated into the built environment to encourage direct human interaction with nature and active engagement with it (Kellert and Calabrese 2015).

Figure 4. 8. Tianjin Qiaoyuan Park, China
(Source: Url 10)

4.3.1.7. Weather

The changes in weather conditions significantly affect the interaction of people with the space. Factors such as air flow, temperature, and humidity are effective in creating these changes (Kellert 2018; Kellert and Calabrese 2015). Besides, these changes play a role in the formation of the weather experience in the environment. Through the use of design implementation such as rainfall collectors, weather awareness can be increased (Kellert 2018). In addition, in the design strategies, factors such as building heights, tree coverage ratios, and ground pavement materials should also be considered that affect the weather in urban areas (Ma et al. 2020).

Figure 4. 9. The Supertrees, Singapore
(Source: Url 11)

4.3.1.8. Views

Landscapes that provide a view opportunity (e.g., coast, mountaintop) have a positive impact on people's environmental preferences. Especially when these landscapes are compatible with the human scale (for example, not too big or too high), they encourage nature experiences (Kellert 2008). In order for this experience to be realized effectively, design implementations such as terraces and changing elevations can be used in design decisions.

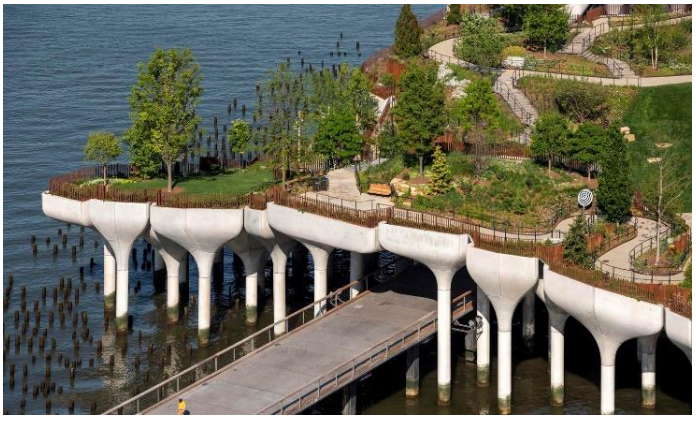

Figure 4. 10. Little Island Park, New York
(Source: Url 12)

4.3.1.9. Fire

Fire is a natural element that has played an important role in the evolution of humanity. Fire or symbolic impressions reminiscent of fire provide positive effects on people, such as satisfaction and relaxation (Kellert 2018). While the use of fire in the built environment is provided with the help of tools such as fireplaces, a symbolic impression of fire can also be created with materials that have light, color, and heat conductivity (Kellert and Calabrese 2015).

Figure 4. 11. Columnless Canopy, Iran
(Source: Url 13)

4.3.2. Indirect Experience of Nature

Indirect nature experiences encourage interaction with nature. Although direct experience is seen as one of the most effective ways of experiencing nature, indirect nature experience is as effective as direct experience and has positive psychological effects on people (Jeon, Yeon, and Shin 2018). In the indirect experience of nature, attributes such as colors, patterns, and textures encourage indirect interaction with nature (Kellert 2008; 2018). Additionally, this symbolic use of nature fosters the development of biophilic design and human creativity (Kellert 2018).

4.3.2.1. Images

Natural images, which allow people to interact with nature indirectly, have positive effects on people, such as an increase in attention capacity and stress reduction (Ulrich 1983; Kahn et al. 2008). The image and representation of nature can be created with the help of different tools, such as paintings, sculptures, and murals (Kellert and Calabrese 2015). Besides, images from the natural world (e.g., flora, fauna, etc.) can be used with these tools. However, these representations must be repeated regularly in order to have a positive effect on people (Kellert and Calabrese 2015).

Figure 4. 12. Orange Park Mural, Florida
(Source: Url 14)

4.3.2.2. Materials

Natural materials are effective in providing an indirect experience of nature as they are visually and tactilely stimulating (Kellert and Calabrese 2015). The organic reactions of natural materials to environmental conditions over time, such as aging, color change, and form change, make them more preferable than artificial materials (Kellert 2008). The fact that human receptors can easily distinguish between natural and artificial materials directs people's material preferences toward natural materials (Browning, Ryan,

and Clancy 2014). In order to provide this effect, different types of natural materials (e.g., wood, stone, soil, etc.) can be used in various design implementations (Kellert and Calabrese 2015).

Figure 4. 13. Semt Piyalepaşa Biophilic Outdoor Space, Istanbul
(Source: Url 15)

4.3.2.3. Texture

The texture is the roughness felt when touching an object, and this roughness varies depending on the characteristic features of the object (Güngör 2005). The textures in nature vary (e.g., soft, hard, etc.), and the use of these textures affects people's landscape preferences. Environments with natural textures (e.g., tree bark, rock surface) without any human intervention are more preferable than environments with artificial textures (e.g., concrete and steel surfaces) (Kellert 2018). Furthermore, natural textures can be integrated into the built environment along with ground pavements, walls, and plants (Alexander, Ishikawa, and Silverstein 1977; Kellert 2018).

Figure 4. 14. Park Erratica, New York
(Source: Url 16)

4.3.2.4. Color

In the evolutionary process, colors have facilitated human life by helping people find vital resources such as food and water and improving their sense of direction (Kellert 2008). The use of color in design strategies can help create an indirect experience of nature. The preference and amount of color used in a design vary according to its intended use (Browning, Ryan, and Clancy 2014). In the use of colors, especially bright colors should be used carefully, and also colors that evoke nature, such as flower, soil, and stone tones, as well as sunset and rainbow colors, should be preferred (Kellert and Calabrese 2015). In addition, the use of green color, which evokes nature, has positive effects such as reducing stress and pain intensity (Takemura et al. 2021) and encouraging creativity (Lichtenfeld et al. 2012).

Figure 4. 15. Urban Bloom, Shanghai
(Source: Url 17)

4.3.2.5. Shapes and Forms

The use of natural shapes and forms in design strategies is frequently preferred to create an indirect experience of nature. Designing the space in harmony with natural shapes and forms increases the aesthetics and attractiveness of the space (Kellert 2008). Natural shapes and forms can be used in a variety of ways, such as the abstraction of animal figures, plant patterns, and plant forms (Kellert and Calabrese 2015). In addition, the use of shells of mollusks, beehives, and the shapes and forms of spider webs are also very common in the field of design (Kellert 2008).

Figure 4. 16. San Antonio Park, Texas
(Source: Url 18)

4.3.2.6. Information Richness

The natural world is home to a wide variety of species. The characteristics of these species enrich the unique knowledge capacity of the natural world. A further benefit of the natural world's diversity and richness is that it encourages people's curiosity and exploration of the natural world (Kellert 2005). Therefore, the information richness in the natural world increases the attractiveness of the environments, and the preferability of these environments is higher than others (Kellert and Calabrese 2015). The information richness of the natural world can be integrated into built environments in different ways, such as through the use of plants, patterns, textures, and forms (Kellert 2008).

Figure 4. 17. Xuhui Runway Park, Shanghai
(Source: Url 19)

4.3.2.7. Change, Age and the Patina of Time

In nature, there are changes and transformation processes that are in harmony with each other, such as growth, aging, and obsolescence. Nature's capacity and dynamic structure are reflected in these processes. People respond favorably to these reflections, which feed their admiration for nature (Kellert 2008). Through the use of design strategies incorporated into the built environment, these reflections can be used to increase awareness of the natural world. In this regard, the use of natural materials that change and wear out with the effect of external conditions over time or the use of aged colors can be preferred (Kellert and Calabrese 2015). In addition, plants that change color with the seasons can also be used for this purpose.

Figure 4. 18. Park Drai Eechelen, Luxembourg
(Source: Url 20)

4.3.2.8. Natural Geometries

In nature, there are many forms that exhibit a mathematical harmony that repeats itself in a specific rhythm and order. Fractals, the Golden Ratio, and the Fibonacci Sequence are the most prominent examples. Among these, in particular, fractal patterns are frequently preferred in landscape design, as the environments in which these patterns are seen positively influence landscape preferences (Hagerhall, Purcell, and Taylor 2004). Fractals can be integrated into the built environment in a variety of ways, such as through structure type, material selection, and facade design (Browning, Ryan, and Clancy 2014). In addition, vegetation, especially trees, can be included in this scope.

Figure 4. 19. Pomegranate Place, China
(Source: Url 21)

4.3.2.9. Simulated Natural Light and Air

Natural light and air are essential for human life. Moreover, natural light and air are the two main factors that come to the fore in shaping the space and the interaction of people with the space. Therefore, simulating these two factors is important for the indirect experience of nature. While simulating light can be achieved by artificial light that imitates the dynamics of natural light, simulating air can be achieved through qualities that affect natural ventilation, such as air flow, humidity, and temperature (Kellert and Calabrese 2015).

Figure 4. 20. Madison Square Park, New York
(Source: Url 22)

4.3.2.10. Biomimicry

Nature is an inspiration source for many design fields. Biomimicry is one of the design approaches inspired by nature. In simple terms, biomimicry provides solutions by imitating systems, forms, and functions in nature (Kellert and Calabrese 2015). This approach, which arouses admiration for the richness of the solution capacity of natural systems, uses many functional features such as the durability of spider webs, hives, and shells in the design (Kellert 2008; Kellert and Calabrese 2015). Additionally, biomimicry is used in various design implementations, including structural design and material selection.

Figure 4. 21. Carbon-Fibre Pavilion Based on Beetle Shells, Germany
(Source: Url 23)

4.3.3. Experience of Space and Place

The experience of space and place is the last experience title in the experience-based framework of biophilic design. The attributes of this title highlight the effects of place-based elements and features on humans' interactions with space and their landscape preferences (Kellert 2018). In this context, experiences of space and place encompass the following attributes: prospect and refuge; organized complexity; mobility; transitional spaces; place; and integrating parts to create wholes.

4.3.3.1. Prospect and Refuge

Throughout evolution, humans have benefited from environments that provided both prospects (to see) and refuge (not to be seen) (Appleton 1975). Prospect provides a clear view for long distances to perceive both opportunities and risks, while the refuge provides a sheltered area for safety (Kellert 2018). These two complementary features of biophilic design can be used with design strategies such as changing elevations, tree canopies, and vista points (Appleton 1975).

Figure 4. 22. Paley Park, New York
(Source: Url 24)

4.3.3.2. Organized Complexity

While repetitive and overly organized environments produce a monotonous and boring effect, environments with a high degree of diversity and detail can produce complexity (Kellert 2008). Therefore, there needs to be a balance between complexity and monotony in the environment. The diversity and opportunities created in this context can play a role in increasing people's curiosity and interest in exploring the environment (Kellert and Calabrese 2015). In integrating this attribute into the built environment, the use of patterns (e.g., fractals) and materials that highlight hierarchy and repetition can be taken into account (Browning, Ryan, and Clancy 2014).

Figure 4. 23. Fengming Mountain Park, China
(Source: Url 25)

4.3.3.3. Mobility

The characteristics of the environment affect basic human orientations such as movement and wayfinding. The free movement of people in an environment positively affects people's comfort and well-being (Kellert and Calabrese 2015). In particular, pathways can be used to provide this mobility in the outdoor environment. Moreover, designing these pathways so that humans interact directly or indirectly with nature can play a significant role in enhancing the impact of biophilic design (Kellert 2018). In this context, green elements (e.g., trees, green walls, green roofs, etc.) used in the outdoor environment can create a natural stage effect and encourage people's mobility (Beatley 2016).

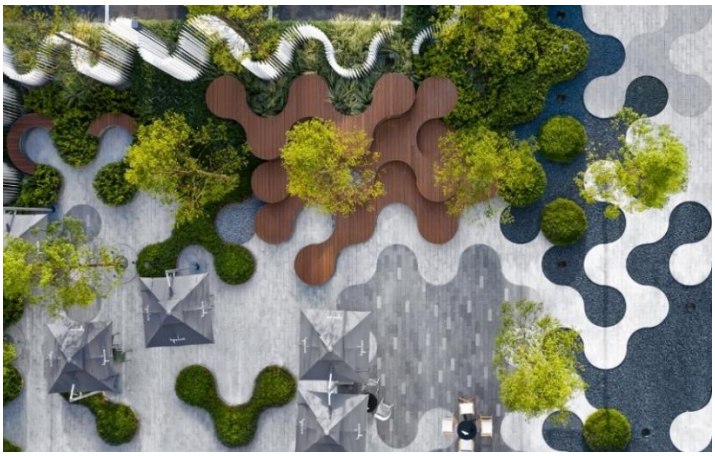

Figure 4. 24. Hyperlane Linear Sky Park, China
(Source: Url 26)

4.3.3.4. Transitional Spaces

The connections and transitions created between indoor and outdoor spaces provide the opportunity to move from one environment to another and contribute positively to people`s orientation and mobility (Kellert 2018). In this attribute, entrances and corridors that act as connectors between various spaces can be used to create these transitional environments (Kellert and Calabrese 2015). In addition, the creation of vertical natural transition zones (e.g., green roofs, vertical gardens, sky parks, etc.) at the urban scale can help achieve this effect (Beatley 2016).

Figure 4. 25. Forest Sports Park, China
(Source: Url 27)

4.3.3.5. Place

A sense of place can be achieved through the use of cultural and ecological connections (Kellert and Calabrese 2015). Biogeographical features like mountains, rivers, and seas can help create an ecological connection to the place (Kellert 2008). Moreover, features such as natural landscapes and local flora and fauna are effective in ensuring people's ecological commitment to the environment (Kellert and Calabrese 2015). Another important connection to a sense of place is the cultural connection. Cultural connections are strengthened by site-specific historical and heroic events (Kellert 2018). For the place attribute, integration of cultural and ecological connections is important. This integration supports long-term sustainable development for both nature and people (Kellert 2008).

Figure 4. 26. Saiki Peace Memorial Park, Japan
(Source: Url 28)

4.3.3.6. Integrating Parts to Create Wholes

Integration of parts to create wholes is an important attribute in the successful implementation of biophilic design (Kellert 2018). In the implementation of this attribute, it is necessary to provide connections between different usages and to support the formation of a connected ecological environment by integrating these usages into the whole (Kellert 2018; Kellert and Calabrese 2015). Thus, wholeness emerges when different uses come together. Thematic or functional focal points can be used in design strategies for the integration of parts into the whole (Kellert and Calabrese 2015).

Figure 4. 27. Bredäng Park, Sweden
(Source: Url 29)

4.4. The Benefits of Biophilic Design

Biophilic design, which is based on the idea of integrating natural elements into the built environment, has important social, environmental, and economic benefits. Biophilic design is often discussed in the context of restorative environmental design, which has a positive impact on people's physical and mental health. The integration of natural elements into the built environment generates biophilic stimuli that have a positive impact on people's health, performance, and well-being (Lerner and Stopka 2016). Additionally, studies on how biophilic design affects people have found various positive effects, such as improved health and well-being (Browning, Ryan, and Clancy 2014; Gillis and Gatersleben 2015; Zhong, Schröder, and Bekkering 2022); reduction of mental fatigue (Rosenbaum, Ramirez, and Camino 2018); reduction of stress and negative emotions (Hartig et al. 2003; Ulrich 2008); improved affective and cognitive functioning (Soderlund and Newman 2015; Ortegón-Cortázar and Royo-Vela 2019); increased productivity and performance (Topgül 2019); and reducing crime (Kuo and Sullivan 2001; Terrapin Bright Green 2012).

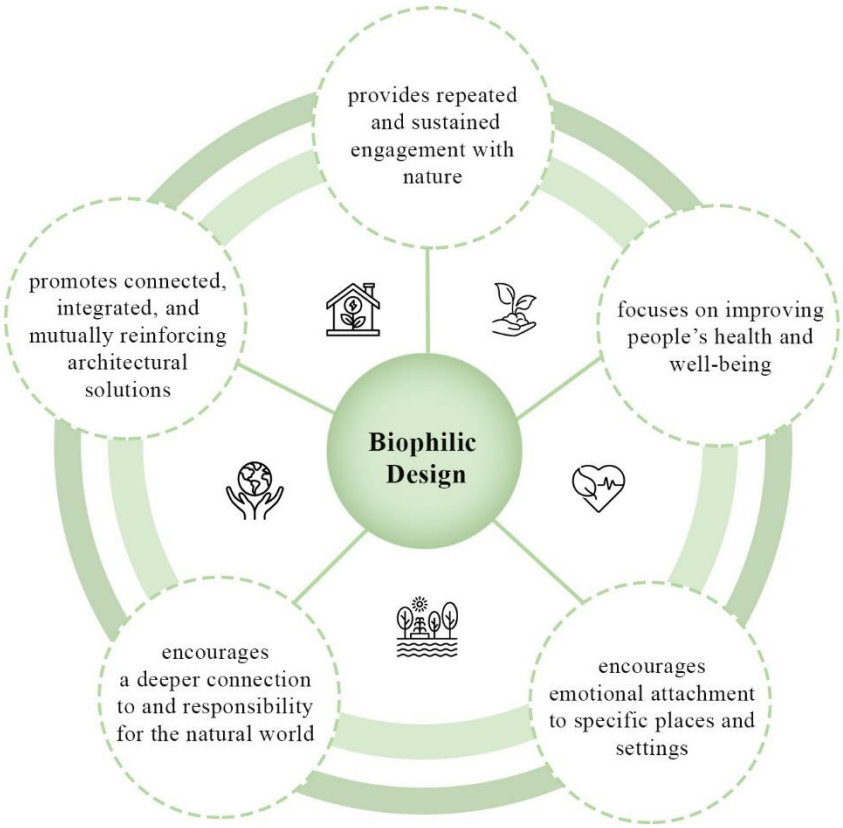

Figure 4. 28. Biophilic design benefits
(Source: Adapted from Kellert and Calabrese 2015)

Biophilic design allows people to get to know the natural world better, helping to strengthen their emotional bond with nature (Kellert 2018). The increase in people's connectedness to nature also helps to develop pro-environmental behaviors (Nisbet, Zelenski, and Murphy 2009). In addition, many design strategies used in biophilic design practices help prevent environmental crises and mitigate their effects. In this context, the design strategies (e.g., green walls, green roofs, natural material selection, etc.) used in practices provide important gains in issues closely related to climate change, such as energy conservation, water management, and urban heat island effect reduction (Obiozo 2012; Soderlund and Newman 2015).

The decrease in interaction with nature in modern urban life creates a threat in terms of social well-being while also causing significant economic losses. Biophilic design, which aims to increase this interaction, benefits society's health and well-being while also helping to reduce expenditures on these issues (Terrapin Bright Green 2012). In addition, as mentioned above, the role of biophilic design practices in reducing the

effects of environmental crises is also effective at preventing economic losses caused by these problems (Soderlund and Newman 2015).

Consequently, biophilic design, which has numerous positive effects, improves social, environmental, and economic conditions. More importantly, biophilic design fosters a sense of ecological and social cohesion by enhancing interactions between humans and non-human beings (Kellert 2018).

4.5. Summary

Biophilic design is based on the biophilia hypothesis, which emphasizes that humans have an inherent predisposition towards nature. However, this natural tendency needs stimulation in order to be improved. The gradual decrease in the areas where people encounter nature in urban spaces does not support the development of the biophilia tendency since it does not provide sufficient conditions for the realization of these arousals. At this point, the biophilic design defined by Kellert (2008) focuses on providing suitable conditions to support the development of biophilia by integrating natural elements into the built environment. In this context, biophilic design aims to strengthen humans interactions with nature by increasing the nature experience potential of the built environment.

There are different studies in the literature on the theoretical framework of biophilic design. However, as this thesis focuses on the experience of nature in UGS, Kellert's (2018) experience-based framework of biophilic design was used among them in both the theoretical framework and the methodology of the study. This framework provides a general overview for the implementation of biophilic design in the built environment, emphasizing the experience of nature. In this experience-based framework, there are three experiences: direct experience of nature, indirect experience of nature, and experience of space and place, and 25 attributes are defined in this context. The direct experience of nature provides direct contact with nature through the senses, such as seeing, hearing, and touching. Natural elements such as light, air, water, plants, animals, and fire, defined within the scope of this title, focus on increasing people's direct interaction with nature. The indirect experience of nature encourages people to interact indirectly with natural attributes such as colors, patterns, and textures. Lastly, the

experience of space and place focuses on how site-specific attributes affect people's interactions with the place. In this context, various attributes such as prospect and refuge, organized complexity, and mobility are defined. In summary, this experience-based framework offers an important opportunity to increase the experience of nature in the built environment. Therefore, it is important to examine this framework in terms of UGS that encourage nature experience in urban life to increase the diminishing nature experience in cities.

Biophilic design enables people to interact with nature in the built environment and benefit from this interaction. Among these benefits, making a positive contribution to the physical and mental health of people and supporting the development of biophilia come to the fore. In addition, the fact that biophilic design is not an approach that prioritizes only human benefit allows nature to be positively affected as well. Consequently, biophilic design offers a significant chance to foster a common understanding of ecological and social integrity in the built environment. Therefore, it is important to examine this approach in terms of UGS and the user experience of nature in order to achieve this integrity.

CHAPTER 5

THE CASE OF KARŞIYAKA

5.1. General Characteristics of Karşıyaka

Karşıyaka district of İzmir province is located on the northern shore of the İzmir Gulf (Figure 5.1). Karşıyaka is surrounded by Bayraklı district in the east, Çiğli district in the west, the İzmir Gulf in the south, and Yamanlar Mountain in the north. The settlement pattern of the district is concentrated in the region between the Gulf and Yamanlar Mountain. According to the Turkish Statistical Institute's 2022 census data, the total population of Karşıyaka, which has 27 neighborhoods, is 346,264.

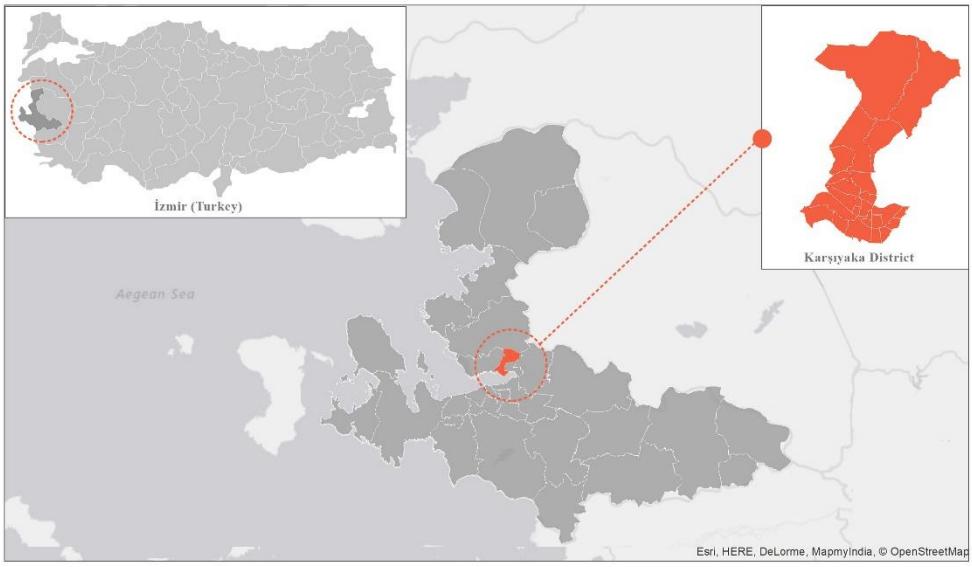

Figure 5. 1. The location of Karşıyaka district
(Source: Prepared by the author using Esri Online OpenStreetMap, 2023)

Karşıyaka district is accessible through major transportation routes, including the coastal boulevard. In addition, transportation to the district is provided by rail system vehicles such as İZBAN and trams, as well as by ferries. The variety of public transportation options for access to Karşıyaka revitalizes the daily use of the district (Özgen and Türkseven Doğrusoy 2020). Moreover, cultural and social activities in the district and commercial activities such as the use of cafes and restaurants also contribute to the daily activity of the district.

During the historical process, there have been significant spatial changes in Karşıyaka district. Karşıyaka, formerly known as Cordelieu (Cordelio), developed rapidly since the late 1860s and became known as a village that stands out with its vineyards, gardens, and olive trees (Berber and Serçe 2011). In the 1900s, there was a noticeable increase in the rate of construction in Karşıyaka (Özkan 2006). In this period, the settlement developed in the direction of Papa Scala, which is a village of Karşıyaka and is known as the Bostanlı neighborhood today (Berber and Serçe 2011). However, as this area was mostly a swamp area, swamp drying work was started and continued up until the 1940s in the settlements (Özkan 2006).

Figure 5. 2. Bostanlı (Papa Scala)-1957
(Source: Url 30)

Figure 5. 3. Bostanlı (Papa Scala)-Today
(Source: Url 31)

Karşıyaka became a district in the 1950s, and by the 1970s, it was known as a summer holiday destination and coastal settlement where people came from other districts to stay (Kıldiş 2006). In the 1970s, Karşıyaka underwent a transformation that was influenced by the urbanization policies implemented across the country (Sayar and Sormaykan Akdur 2009). Since the 1970s, due to intense migration, slum areas have emerged in the district, and the coastal settlement profile of the district has gradually transformed into a dense settlement pattern that has expanded towards the north (Zengin Çelik and Çilingir 2017). This situation resulted in a fragmented and distorted settlement pattern in the district, which was once notable for its green areas and gardens (Kıldiş 2006).

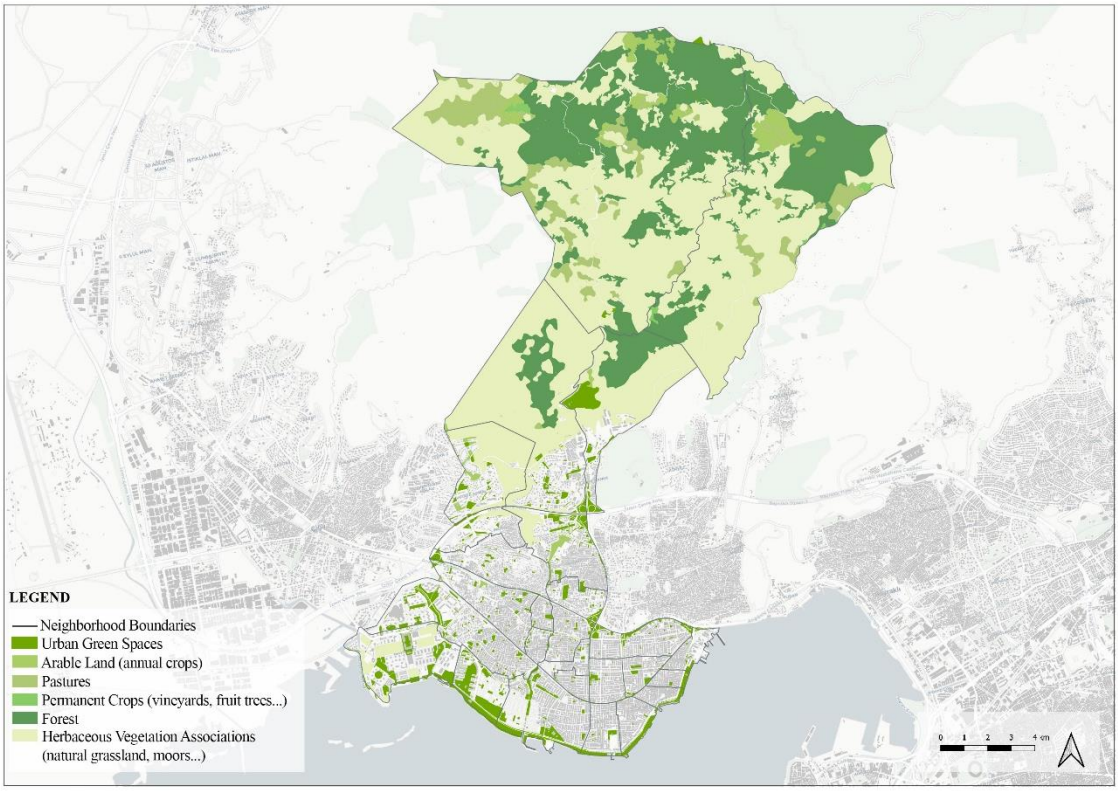

Figure 5. 4. Green spaces of Karşıyaka district
(Source: Prepared by the author using Urban Atlas 2018)

Considering the current situation of the green areas of the district, there are green areas that provide different ecological and socio-economic services at various scales (Figure 5.4). To the north of the district, green areas consisting of forests, arable land, pastures, permanent crop areas, and herbaceous vegetation associations are concentrated. In addition to these, UGS are concentrated in the area where the urban settlement is located.

5.2. Bostanlı Neighborhood and Case Study Areas

Bostanlı neighborhood is located in the southern part of Karşıyaka district. According to the Turkish Statistical Institute's 2022 census data, Bostanlı neighborhood, which is the second most populated neighborhood of Karşıyaka, has a population of 30,773. The proximity of the Bostanlı neighborhood to the coast makes it advantageous

in terms of both coastal use and the use of open and green spaces. The Bostanlı neighborhood is easily accessible via public transportation, including trams and ferries. Furthermore, this makes the neighborhood attractive to people living in other districts of Izmir who want to use the neighborhood's facilities in their daily lives. However, the fact that Bostanlı has become a center of attraction over the years has led to an increase in the pressure of construction in the neighborhood (Zengin Çelik and Çilingir 2017). Considering the urbanization process of the Bostanlı neighborhood as well as population density and location, the Bostanlı neighborhood was chosen in the Karşıyaka district within the scope of the study area. Additionally, as a result of quantitatively and qualitatively evaluating UGS in the neighborhood, three neighborhood parks—Adnan Saygun Park, Hıfzı Veli Velidedeoğlu Park, and M. Senai Ertekin Park—in the Bostanlı neighborhood were selected as the case study areas (Figure 5.5). In the selection of these neighborhood parks, the surroundings of the parks, their spatial characteristics, and the distances of the parks to each other were considered.

Figure 5. 5. The locations of the three selected neighborhood parks
(Source: Prepared by the author using QGIS 3.28.3)

These selected parks are representative of parks that were designed using a standard design approach and are similar in terms of spatial characteristics. However, in the selection of these parks, their differing spatial characteristics and surrounding features were considered. In this context, Adnan Saygun Park was selected based on its connection to public transportation, its distinctive features (e.g., a water pool and dog park), and the construction site in the immediate vicinity of the park. During the selection of Hıfzı Veldet Velidedeoğlu Park, the main factors taken into account were the park's size, the different types of plants in the park, and its nearness to a major road and the coast. Finally, in the selection of M. Senai Ertekin Park, the size of the park, plant diversity, and location of the park were taken into consideration as it is surrounded by residential areas.

5.3. Methodology

Since the scope of UGS is a broad concept, in this study, the use of UGS is discussed within the context of neighborhood parks, where people can easily interact with nature in their daily lives. Therefore, the “nature experience” mentioned in the study refers to the urban nature experience. As qualitative research methods allow for the understanding and exploration of people's emotions, perceptions, attitudes, and experiences (Kumar 2011), for this study, a qualitative research method was used through a case study approach. In this direction, three neighborhood parks located in the Bostanlı neighborhood of Karşıyaka district were selected as case study areas. The location of the neighborhood and the quantitative and qualitative values of the UGS in the neighborhood were considered in the selection of the Bostanlı neighborhood, which is the second neighborhood with the highest population in Karşıyaka district. In the selection of neighborhood parks as case study areas, the spatial characteristics and surroundings of the parks and their distance from each other were considered. Besides, three parks with different spatial characteristics and surroundings were chosen to provide a diverse and representative sample of UGS and to achieve a more comprehensive understanding of to what extent the use of UGS in places where urbanization is intense affects the user's experience of nature.

After conducting a literature review, two levels were identified for the nature experience: the environmental level, which covers the nature that is experienced, and the

individual level, which includes the subjective experience of nature by individuals. In this direction, the case study was structured around two main parts: an examination of the spatial characteristics and nature experience potentials of the selected neighborhood parks and an understanding of the users' nature experiences in these parks (Figure 5.6). In the first part, the spatial characteristics and nature experience potentials of the selected neighborhood parks were analyzed through site analysis and field observations. As the analysis framework for the nature experience potentials of the neighborhood parks in this step, Kellert's (2018) experience-based framework, which consists of three experiences and 25 attributes, was used. In the second part, a nature experience workshop was carried out in the selected neighborhood parks to understand the users' nature experiences and the needs and motivations behind these experiences. The general operation of this workshop was provided by the nature experience activity cards and user observation reports produced for this study. The content of these cards was determined within the scope of the experience-based framework of biophilic design, which was also used in the first part. Besides, in order to gain a better understanding of the users' nature experience, an empathy map, one of the User Experience (UX) methods, was adapted for this study. The user empathy maps prepared as a result of this adaptation were used to understand the views of the participants on their nature experiences in the parks after the workshop activities were completed. Although there is no common agreement regarding the number of workshop participants, 6–12 people are recommended as a manageable group size (Brown 2022). In this direction, the nature experience workshop was held with the participation of seven participants living in the Bostanlı neighborhood. In the nature experience workshop, the same activities were completed in the same order in the three selected parks.

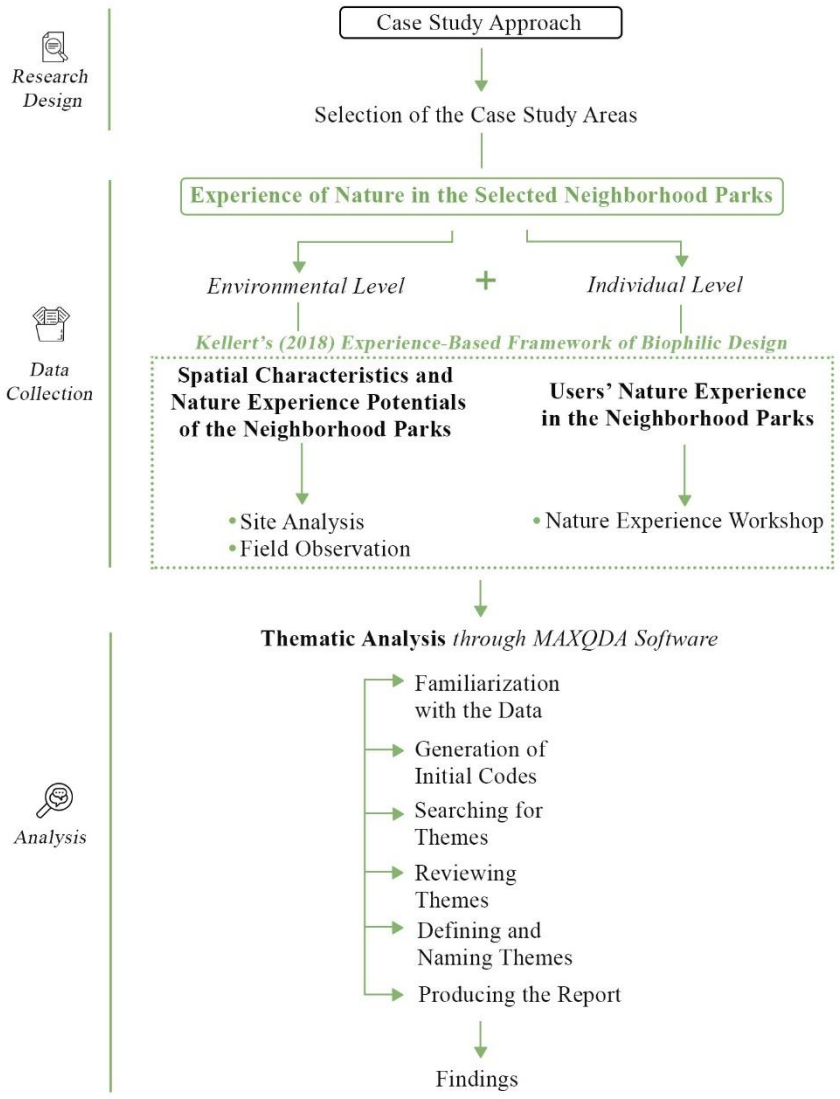

Figure 5. 6. Flow chart of the methodology
(Source: Prepared by the author)

In the analysis phase of the data obtained, thematic analysis, which provides a detailed description and a flexible approach in the analysis process of the data (Braun and Clarke 2006), was used. In this direction, using the MAXQDA software, Braun and Clarke's (2006) thematic analysis framework, which consists of six steps, was followed: familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. After the thematic analysis steps were completed, three themes were extracted from the data set within the

scope of the research questions: "The Meaning of Nature, The Sensory Experience of Nature, and The Role of the Neighborhood Park's Spatial Characteristics."

5.4. Spatial Characteristics and Nature Experience Potentials of the Selected Neighborhood Parks

The analysis of the selected neighborhood parks was conducted in two main parts: analyzing the spatial characteristics of the parks and their nature experience potentials.

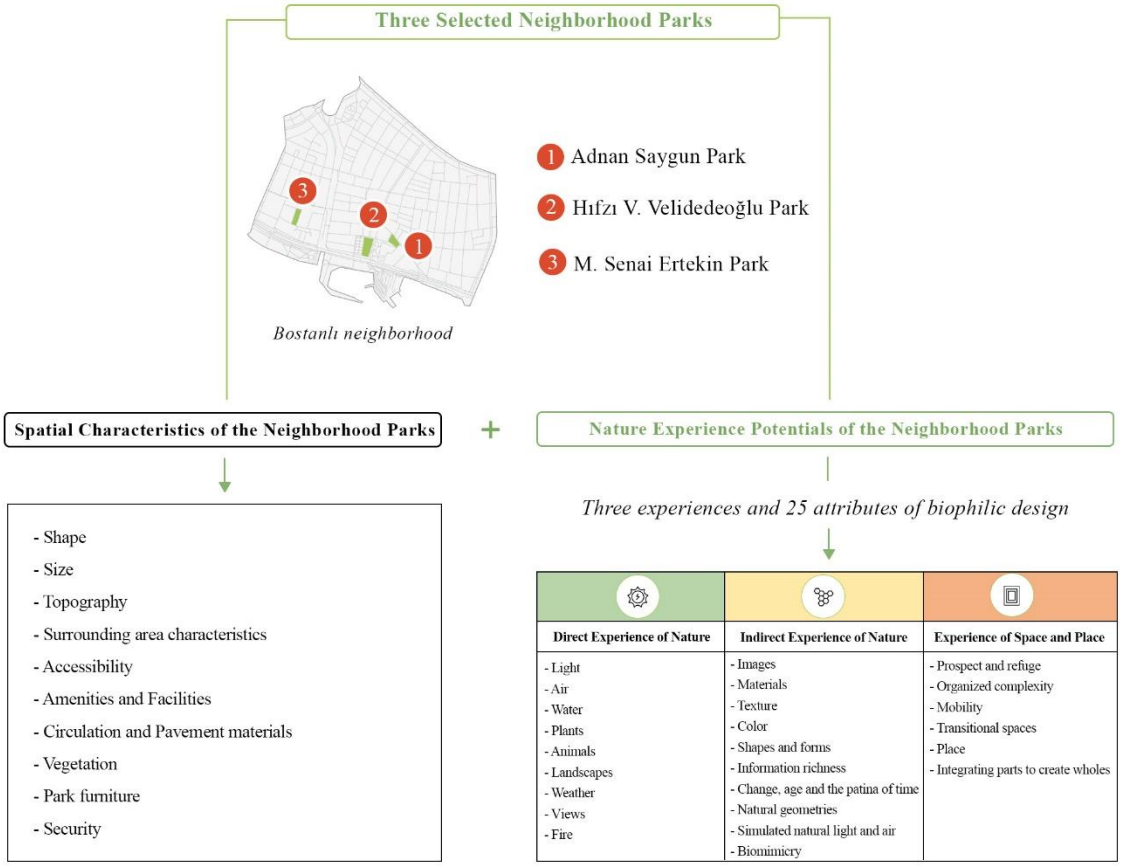

Figure 5. 7. Analysis framework for the selected neighborhood parks
(Source: Prepared by the author)

For the analysis of the spatial characteristics of the neighborhood parks, 11 sub-criteria were determined (Figure 5.7). Additionally, for the analysis of the nature-experience potentials of neighborhood parks, in each park, an average of 2–3 hours of field observation were conducted in one day. Kellert's (2018) experience-based framework of biophilic design was used as the analysis framework.

5.4.1. Adnan Saygun Park

The area of Adnan Saygun Park is 3,000 square meters and the park has an irregular shape. The park is located on flat terrain. In the close vicinity of the park, there are Güzel Sanatlar Park and Ufuk Sarıca Park.

Figure 5. 8. Surroundings of the Adnan Saygun Park
(Source: Prepared by the author)

The Güzel Sanatlar Park, which is approximately 20,000 square meters in size and has various amenities and facilities such as cafes, restaurants, and children's playgrounds, provides services at the district level. In this study, since the nature experience in UGS is examined through neighborhood parks, Güzel Sanatlar Park was not included within the scope of the case study areas. Additionally, Ufuk Sarıca Park, located in the southeast of the Adnan Saygun Park, was not selected considering that the landscape features of the Adnan Saygun Park (e.g., plant diversity, a water element, etc.) provide suitable conditions for understanding the user's nature experience compared to Ufuk Sarıca Park.

In addition to these parks, in the close vicinity of the Adnan Saygun Park, there are mixed-use buildings (commercial and residential). Generally, the ground floor of these buildings is used as a cafe or restaurant. Besides, the number of floors in these buildings varies between five and seven. In addition to these, there are ongoing construction sites, a mosque, an education unit, a square, a parking lot, and a cultural center used as an open-air theater in the immediate vicinity of the park. When Adnan Saygun Park is examined in terms of accessibility, there are main pedestrian axes connected to the coast around the park. Additionally, the park has an advantageous location in close proximity to the Bostanlı pier, tram stop, and nearby bus stops.

Figure 5. 9. Images from the surroundings of the Adnan Saygun Park
(Source: Prepared by the author)

Figure 5. 10. Adnan Saygun Park Plan
(Source: Prepared by the author)

Figure 5. 11. Amenities and facilities in the Adnan Saygun Park
(Source: Prepared by the author)

Adnan Saygun Park has a variety of amenities and facilities (Figure 5.11), including seating areas, a dog park, a pond, and sports equipment. When the park's circulation is examined, the park has four entrances, leading to different areas of the park. The entrance connected to Ceyhan Gür Street leads to the security unit and the dog park, while the two entrances connected to Cemal Gürsel Street lead to the pond and seating areas. Lastly, when entering the park from the entrance to the north of the Ufuk Sarıca Park, sports equipment is encountered.

Since the park is located on flat ground, this provides an advantage in terms of pedestrian circulation. Pedestrian circulation in the park is provided organic pathways. These pathways branch from around the pool to the rest of the park. Two types of materials (Figure 5.12) are used in pavement material, namely paving stones and rock pavement.

Figure 5. 12. Pavement materials in the Adnan Saygun Park
(Source: Prepared by the author)

When the vegetation of the park is examined, it is seen that there are trees, shrubs, flowers, and grass (Figure 5.13). There are mostly coniferous and narrow-leaved trees in the park. Among the trees in the park are Schinus areira, various pine tree species, a palm tree, and Prunus armeniaca. Besides trees, there are various types of flowers in the park. The flowers in the park are especially concentrated in the flower bed adjacent to the pond. Taraxacum erythrospermum, Taraxacum mongolicum, Rosa pouzinii, Lathyrus niger, and Euryops pectinatus are among the flowers found in the park. In addition to all these, there are also different types of shrubs and grass in the park.

Figure 5. 13. Vegetation in the Adnan Saygun Park
(Source: Prepared by the author)

In the park, seating units, trash bins, and park lambs are used as park furniture (Figure 5.14). There are ten metal benches in total as seating units in the park. The trash bins in the park are located close to the park entrances, and there are four trash bins in total. The lighting of the park is provided by triple LED lamps, and there are six park lamps in total. In addition to these, when the park is examined in terms of security, the park's security is provided by the security unit.

Figure 5. 14. Park furniture in the Adnan Saygun Park
(Source: Prepared by the author)

In addition to the spatial characteristics of the Adnan Saygun Park, the nature experience potential of the park was analyzed in order to understand the conditions that the park offers for the user's nature experience. In this direction, field observations were conducted using the experience-based framework of biophilic design as the analysis framework. In the analysis carried out on the nature experience potential of the park, first the direct experience of nature and then the indirect experience of nature and experiences of space and place were followed, respectively. Considering the definitions of the attributes defined under these titles within the scope of biophilic design (see 4.3. Experiences and Attributes of Biophilic Design), markings were made on the park map, photographs were taken, and observation notes were recorded. As a result of this process, the nature experience potential of the Adnan Saygun Park was analyzed within the scope of the experience-based framework of biophilic design.

The analysis of the nature experience potential of the park is described in Figure 5.15 and Table 5.1. In Figure 5.15, the attributes that can be displayed spatially on the park map are marked, and the information about the features that cannot be displayed spatially is presented in Table 5.1.

Table 5. 1. Experiences and attributes of biophilic design in the Adnan Saygun Park
(D: Direct Experience of Nature, I: Indirect Experience of Nature, E: Experience of Space and Place)

Experience	Attributes	Design Elements	
Direct Experience of Nature	D.1. Light	D.1.1.	Sunlight
	D.2. Air	D.2.1.	Pond
		D.2.2.	Vegetation
	D.3. Water	D.3.1.	Pond
	D.4. Plants	D.4.1.	Different types of plants (trees, flowers, shrubs, grass, etc.)
	D.5. Animals	D.5.1.	Dog park
	D.6. Landscapes	D.6.1.	Vegetation
		D.6.2.	Pond
	D.7. Weather	D.7.1.	Tree-shaded areas
	D.8. Views	-	There is no area or elevation in the park that provides views.
	D.9. Fire	-	There is no representation of fire in the park.
Indirect Experience of Nature	I.1. Images	I.1.1.	Plant species
		I.1.2.	Pond
	I.2. Materials	I.2.1.	Rock pavement
	I.3. Texture	I.3.1.	Coniferous and thin-leaved trees
		I.3.2.	Rock pavement
	I.4. Color	I.4.1.	Green benches
		I.4.2.	Soil-colored ground pavement
		I.4.3.	Plants with different shades of green
	I.5. Shapes and forms	I.5.1.	Plants with different leaf forms
		I.5.2.	Rock pavement
	I.6. Information richness	-	There is no informative description of the plant species or other natural elements in the park.
	I.7. Change, age and the patina of time	I.7.1.	Deciduous trees
	I.8. Natural geometries	I.8.1.	Fractal patterns on trees
		I.8.2.	Rock pavement
	I.9. Simulated natural light and air	I.9.1.	Vegetation
		I.9.2.	Pond
	I.10. Biomimicry	-	There is no representation of biomimicry in the park.
Experience of Space and Place	E.1. Prospect and Refuge	-	There is no representation of prospect and refuge in the park.
	E.2. Organized complexity	E.2.1.	Repeating stones in the ground pavement
	E.3. Mobility	E.3.1.	Pathways
	E.4. Transitional spaces	E.4.1.	Pathways branching around the pond

(cont. on the next page)

Table 5. 1. (cont.)

	E.5. Place	E.5.1.	Sculpture of Adnan Saygun, the classical music composer who gave the park its name
	E.6. Integrating parts to create wholes	-	There is no representation of integrating parts to create wholes in the park.

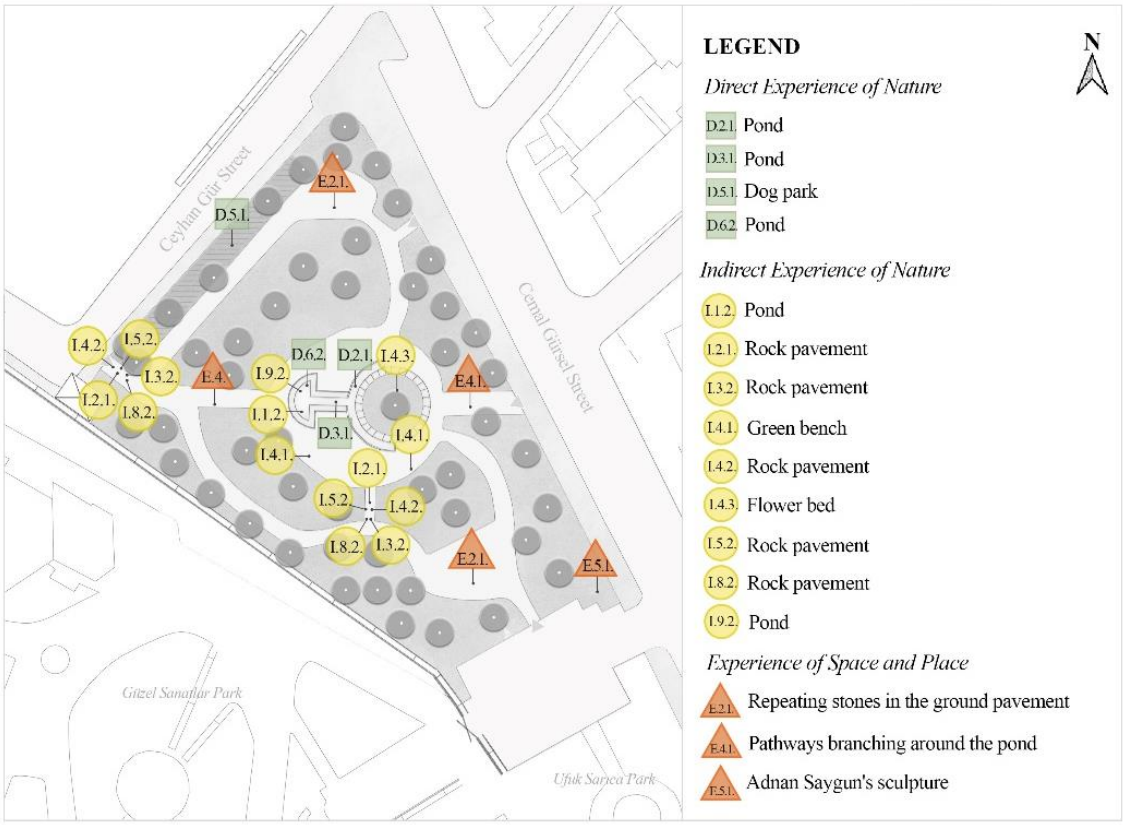

Figure 5. 15. Design elements found for the biophilic design attributes in the Adnan Saygun Park
(Source: Prepared by the author)

Examining Figure 5.15 and Table 5.1 reveals that the design elements corresponding to the attributes that allow the user to experience nature indirectly in the park are more diverse than the design elements corresponding to the attributes defined in the titles "direct experience of nature" and "experience of space and place." In this regard, the use of vegetation and ground pavement materials is particularly prominent. For direct interaction with nature, the design elements related to the attributes of the direct experience of nature are predominantly constituted by vegetation. Lastly, in the context

of the experience of space and place, pathways emerge as the most prominent design element in the park.

5.4.2. Hıfzı Veldet Velidedeoğlu Park

The area of the Hıfzı Veldet Velidedeoğlu Park is 6,500 square meters and the park has an irregular shape. The park is located on flat terrain. When the close surroundings of the park are examined, there is an open parking lot to the west of the park and the Güzel Sanatlar Park to the east. In addition, there are mixed-use buildings (residential and commercial) in the close vicinity of the park. Generally, the ground floor of these buildings is used as a cafe, restaurant, or market. The number of floors in these buildings varies between five and nine. In the surrounding area of the park, there is also an education unit and a construction site. In addition, in the south of the park, there are open green spaces and a public square.

Figure 5. 16. Surroundings of the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

Figure 5. 17. Images from the surroundings of the Hıfzı Veldet Velidedeoğlu Park (Source: Prepared by the author)

Hıfzı Veldet Velidedeoğlu Park is located close to the main road and coast. Since the park is located close to the coast, access to the park is also provided from the main pedestrian axis and bicycle road connected to the coast. In addition, there is the Bostanlı pier, a tram stop, and bus stops in the immediate vicinity of the park. Therefore, access to the park via various public transportation connections shows that the park is in an advantageous location in terms of accessibility.

Figure 5. 18. Hıfzı Veldet Velidedeoğlu Park Plan
(Source: Prepared by the author)

When the Hıfzı Veldet Velidedeoğlu Park is examined in terms of amenities and facilities (Figure 5.19), there are seating areas, a basketball court, an organic market, a playground, a sculpture, a monument, and a fountain. Besides, for animals, there are also a dog house and bird houses in the park. Additionally, when the circulation in the park is examined, there are 11 entrances that lead to different areas of the park. These park entrances direct the user to the seating areas, basketball court, organic market, and playground.

Figure 5. 19. Amenities and facilities in the Hıfzı Veldet Velidedeoğlu Park (Source: Prepared by the author)

Since the park is located on flat ground, this facilitates pedestrian circulation around and within the park. Pedestrian circulation in the park is provided through straight and organic pathways. Paving stone is used extensively in the ground pavement of these pathways (Figure 5.20).

Figure 5. 20. Pavement materials in the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

When the park's vegetation is examined, there are a variety of trees, flowers, shrubs, and grass. In the park, there are mostly coniferous and narrow-leaved trees (Figure 5.21). Acacia melanoxylon, Magnolia grandiflora, a palm tree, and various pine tree species are among the trees in the park.

Figure 5. 21. Trees in the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

In addition to the trees, there are also different types of flowers in the park. In these, there are Taraxacum erythrospermum, Taraxacum mongolicum, and Grevillea rosmarinifolia. Besides, there are mushrooms, different types of shrubs, and grass in the park (Figure 5.22).

Figure 5. 22. Vegetation of the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

In the park, there are seating units, trash bins, and two types of park lamps as park furniture (Figure 5.23). There are a total of 38 wooden benches as seating units in the park, and there are a total of 25 metal trash bins, which are usually located next to the benches and at the park entrances. In addition to these, two types of LED lamps, double and triple, are used in the lighting of the park, and there are 13 park lamps in total. Additionally, when the park is examined in terms of security, there is no security unit or security camera in the park.

Figure 5. 23. Park furniture in the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

In addition to all these, the nature experience potential of the Hıfzı Veldet Velidedeoğlu Park was analyzed according to the three experiences and 25 attributes of biophilic design by following the process specified in the Adnan Saygun Park. In this direction, the design elements in the park that correspond to the attributes defined in the experiences are shown in Table 5.2, and those that can be displayed spatially from these elements are shown in Figure 5.24.

Table 5. 2. Experiences and attributes of biophilic design in the Hıfzı Veldet Velidedeoğlu Park
(D: Direct Experience of Nature, I: Indirect Experience of Nature, E: Experience of Space and Place)

Experience	Attributes	Design Elements	
	D.1. Light	D.1.1.	Sunlight

(cont. on the next page)

Table 5. 2. (cont.)

	D.2. Air	D.2.1.	Vegetation
	D.3. Water	D.3.1.	Fountain
	D.4. Plants	D.4.1.	Different types of plants (trees, flowers, shrubs, grass, etc.)
	D.5. Animals	D.5.1.	Dog house
		D.5.2.	Bird house
	D.6. Landscapes	D.6.1.	Vegetation
	D.7. Weather	D.7.1.	Tree-shaded areas
	D.8. Views	-	There is no area or elevation in the park that provides views.
	D.9. Fire	-	There is no representation of fire in the park.
Indirect Experience of Nature	I.1. Images	I.1.1.	Plant species
		I.1.2.	Wave painting on the fountain wall
		I.1.3.	Tree, sun, and animal symbols on the playground
	I.2. Materials	I.2.1.	Wooden bench
		I.2.2.	Rock pavement
	I.3. Texture	I.3.1.	Coniferous and thin-leaved trees
		I.3.2.	Rock pavement
	I.4. Color	I.4.1.	Plants with different shades of green
		I.4.2.	Wooden bench
	I.5. Shapes and forms	I.5.1.	Plants with different leaf forms
		I.5.2.	Circular pathway paving
		I.5.3.	Circular plant beds
	I.6. Information richness	-	There is no informative description of the plant species or other natural elements in the park.
	I.7. Change, age and the patina of time	I.7.1.	Deciduous trees
	I.8. Natural geometries	I.8.1.	Fractal patterns on trees
	I.9. Simulated natural light and air	-	There is no representation of simulated natural light and air.
	I.10. Biomimicry	-	There is no representation of biomimicry in the park.
Experience of Space and Place	E.1. Prospect and Refuge	-	There is no representation of prospect and refuge in the park.
	E.2. Organized complexity	E.2.1.	Repeating stones in the ground pavement
	E.3. Mobility	E.3.1.	Pathways
	E.4. Transitional spaces	E.4.1.	Pathways branching around the monument
	E.5. Place	E.5.1.	Sculpture of Hıfzı Veldet Velidedeoğlu, the journalist who gave the park its name
	E.6. Integrating parts to create wholes	-	There is no representation of integrating parts to create wholes in the park.

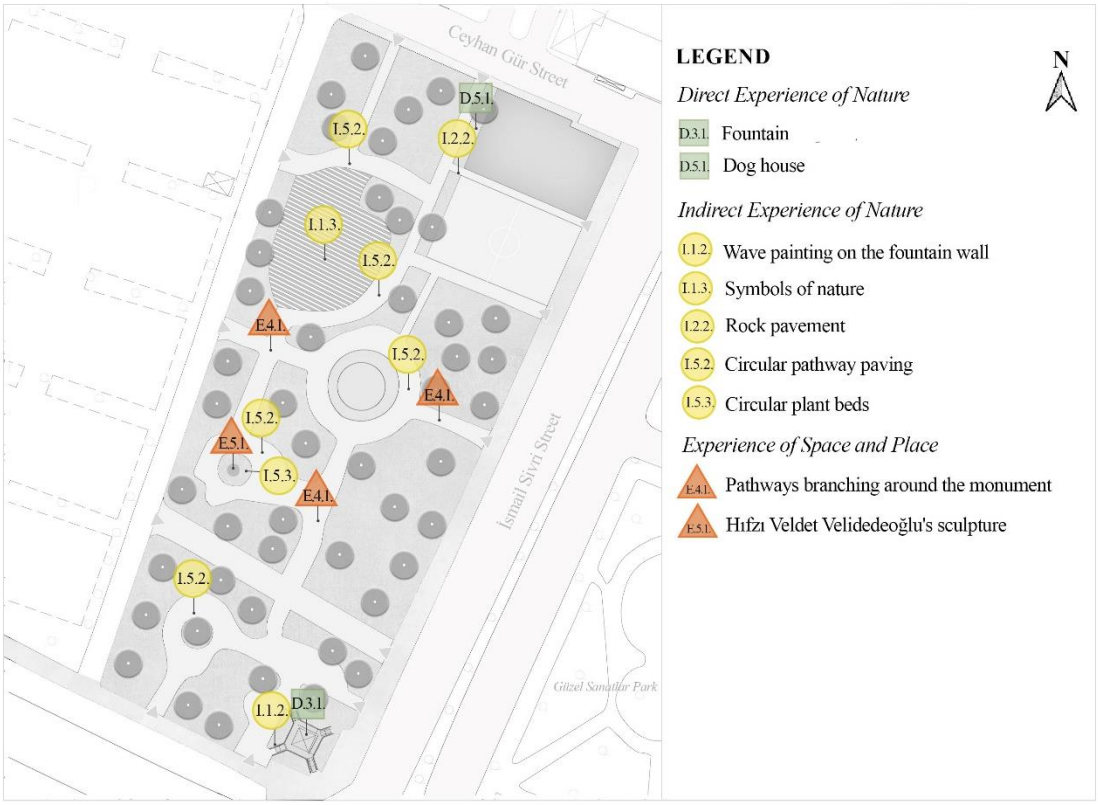

Figure 5. 24. Design elements found for the biophilic design attributes in the Hıfzı Veldet Velidedeoğlu Park
(Source: Prepared by the author)

When Table 5.2 and Figure 5.24 are examined, it is seen that the design elements corresponding to the attributes in the indirect experience of nature in the Hıfzı Veldet Velidedeoğlu Park are more diverse than the other two experience headings. The use of vegetation, ground pavement materials, and wooden benches are particularly prominent in this regard. Additionally, for the direct experience of nature, there are animal houses, such as dog and bird houses, alongside vegetation as prominent design elements. Lastly, in the context of the experience of space and place, pathways emerge as the most prominent design element.

5.4.3. M. Senai Ertekin Park

The area of the M. Senai Ertekin Park is 2,500 square meters and the park has an rectangular shape. The park is located on flat terrain. When the immediate surroundings of the park are examined, there are mostly residential uses. The number of floors in these buildings varies between two and four. In addition to residential uses, there are mixed-use buildings in the immediate vicinity of the park, the ground floor of which is used for commercial uses such as cafes and restaurants. In addition to these, there is a football field, a playground, a public institution, a parking lot, and a hotel for commercial use around the park. In the south part of the park, there are open green spaces.

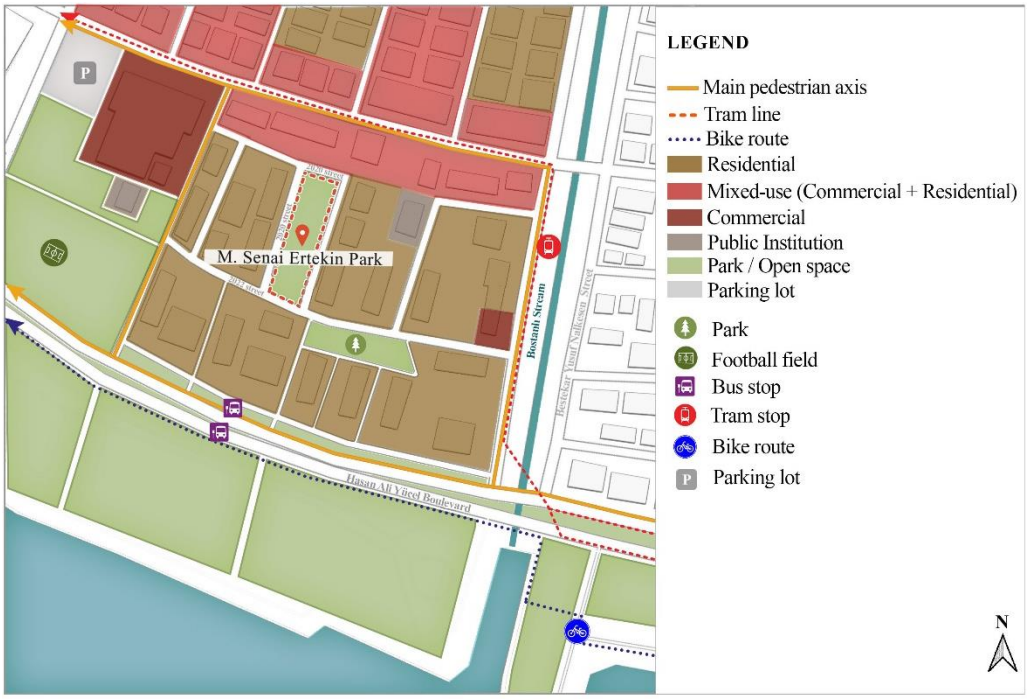

Figure 5. 25. Surroundings of the M. Senai Ertekin Park
(Source: Prepared by the author)

When the park is examined in terms of accessibility, access is mainly provided via the main pedestrian axis, which connects the park to the surrounding neighborhood.

In addition, the park is located near several public transportation options, including a tram stop and bus stops in the immediate vicinity.

Figure 5. 26. Images from the surroundings of the M. Senai Ertekin Park
(Source: Prepared by the author)

Figure 5. 27. M. Senai Ertekin Park Plan
(Source: Prepared by the author)

When the park is examined in terms of amenities and facilities (Figure 5.28), it is seen that there is no diversity in this regard. In this context, there are seating units and a bird sculpture inscribed with the poem of M. Senai Ertekin, who gave the park its name and is known for his love of nature in the park. Additionally, for animals, there is also a cat house in the park. The park has seven entrances in total, and these entrances usually direct the user to the seating areas in the park.

Figure 5. 28. Amenities and facilities in the M. Senai Ertekin Park
(Source: Prepared by the author)

The fact that the park is on flat ground facilitates pedestrian circulation in and around the park. Pedestrian circulation in the park is provided through straight, organic-shaped pathways branching around the circular plant beds in the park. Paving stone is used extensively in the ground pavement of these pathways (Figure 5.29).

Figure 5. 29. Pavement materials in the M. Senai Ertekin Park
(Source: Prepared by the author)

When the park is examined in terms of vegetation, it is observed that there are a variety of trees in the park (Figure 5.30). There are generally coniferous and thin-leaved trees in the park. These include pine tree species, palm trees, olive trees, Cupressus sempervirens, and Schinus molle trees.

Figure 5. 30. Trees in the M. Senai Ertekin Park
(Source: Prepared by the author)

There are also range of flowers in the park, including daisies, Scorpion grasses, and Taraxacum erythrospermum. In addition to these, there are different types of shrubs and grass in the park (Figure 5.31).

Figure 5. 31. Vegetation in the M. Senai Ertekin Park
(Source: Prepared by the author)

In the park, there are seating units, trash bins, and parking lamps as park furniture (Figure 5.32). Metal benches of two colors, red and green, are used as the seating units in the park, and there are eight benches in total. There are a total of three metal trash bins located near the benches in the park. Besides, one of them is used for plastic recycling. In addition to these, the parking lamps provide lighting for the park, and there are three parking lamps in total. Lastly, when the park is examined in terms of security, there is no security unit or security camera in the park.

Figure 5. 32. Park furniture in the M. Senai Ertekin Park
(Source: Prepared by the author)

In addition to all these, the nature experience potential analysis of the park was carried out using the same process used in the other two selected parks nature experience potential analyses. In this analysis made within the scope of the experiences and attributes of biophilic design, all the design elements in the park that correspond to the attributes are shown in Table 5.3, and those that can be spatially displayed are shown in Figure 5.33.

Table 5. 3. Experiences and attributes of biophilic design in the M. Senai Ertekin Park
(D: Direct Experience of Nature, I: Indirect Experience of Nature, E: Experience of Space and Place)

Experience	Attributes	Design Elements	
	D.1. Light	D.1.1.	Sunlight
	D.2. Air	D.2.1.	Vegetation

(cont. on the next page)

Table 5. 3. (cont.)

	D.3. Water	-	There is no representation of water in the park.
	D.4. Plants	D.4.1.	Different types of plants (trees, flowers, shrubs, grass, etc.)
	D.5. Animals	D.5.1.	Cat house
	D.6. Landscapes	D.6.1.	Vegetation
	D.7. Weather	D.7.1.	Tree-shaded areas
	D.8. Views	-	There is no area or elevation in the park that provides views.
	D.9. Fire	-	There is no representation of fire in the park.
Indirect Experience of Nature	I.1. Images	I.1.1.	Plant species
		I.1.2.	Bird sculpture
	I.2. Materials	I.2.1.	Wooden cat house
	I.3. Texture	I.3.1.	Coniferous and thin-leaved trees
		I.3.2.	Bird sculpture
	I.4. Color	I.4.1.	Plants with different shades of green
		I.4.2.	Green bench
	I.5. Shapes and forms	I.5.1.	Plants with different leaf forms
		I.5.2.	Circular plant beds
	I.6. Information richness	-	There is no informative description of the plant species or other natural elements in the park.
	I.7. Change, age and the patina of time	I.7.1.	Deciduous trees
	I.8. Natural geometries	I.8.1.	Fractal patterns on trees
	I.9. Simulated natural light and air	-	There is no representation of simulated natural light and air.
	I.10. Biomimicry	-	There is no representation of biomimicry in the park.
Experience of Space and Place	E.1. Prospect and Refuge	-	There is no representation of prospect and refuge in the park.
	E.2. Organized complexity	-	There is no representation of organized complexity in the park.
	E.3. Mobility	E.3.1.	Pathways
	E.4. Transitional spaces	E.4.1.	Pathways branching around the circular plant beds
	E.5. Place	E.5.1.	Bird sculpture inscribed with the poem of M. Senai Ertekin, who gave the park its name and is known for his love of nature
	E.6. Integrating parts to create wholes	-	There is no representation of integrating parts to create wholes in the park.

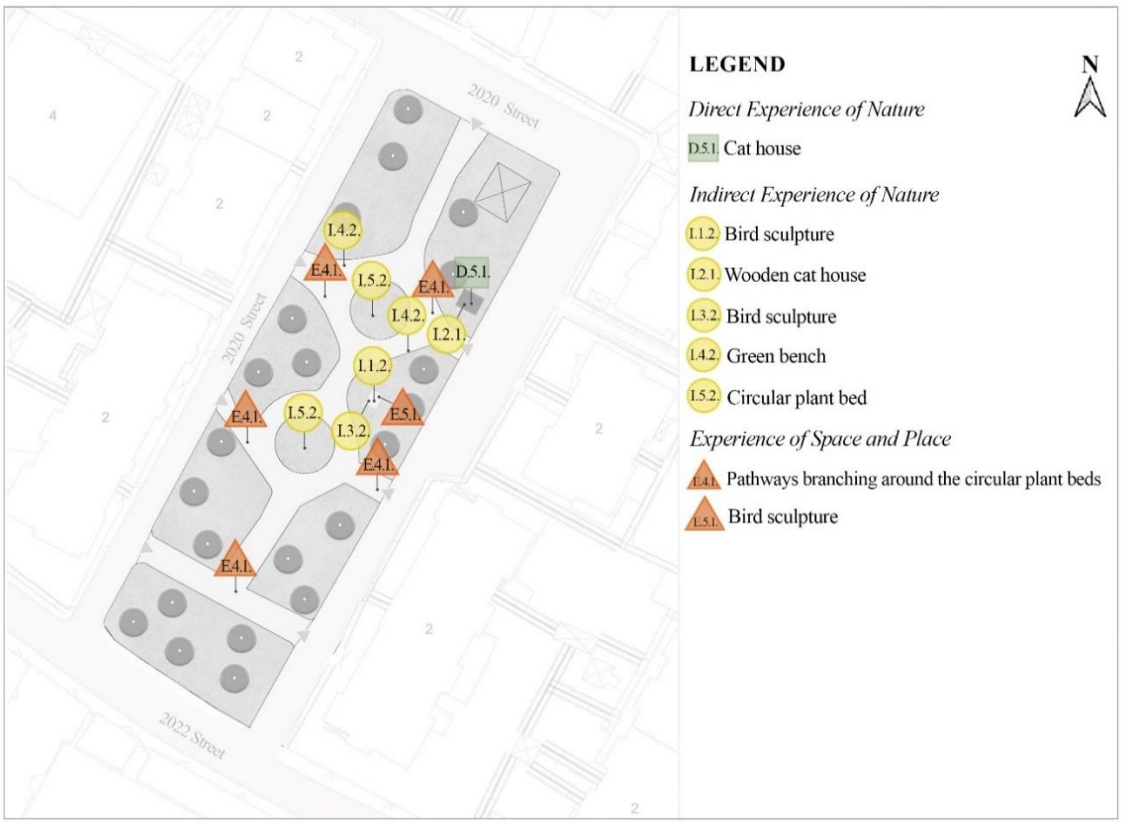

Figure 5. 33. Design elements found for the biophilic design attributes in the M. Senai Ertekin Park
(Source: Prepared by the author)

Table 5.3 and Figure 5.33 reveal that the design elements corresponding to the attributes in the indirect experience of nature in the M. Senai Ertekin Park are more diverse than the other two experience headings. Vegetation emerges as the key factor behind this diversity. Similarly, the design elements related to the attributes of the direct experience of nature are predominantly constituted by vegetation. In contrast, when examining the design elements related to the experience of space and place in the park, pathways come to the fore as the most prominent design element.

When the results of the analysis of the nature experience potentials of the three selected parks are compared, it is understood that although the parks have relatively different spatial characteristics and surrounding features, they are similar to each other in terms of the variety and quantity of design elements they offer to users for nature experience. In this context, common elements included vegetation for the direct

experience of nature, vegetation and ground pavement materials for the indirect experience of nature, and pathways for the experience of space and place in the parks.

5.5. Users' Nature Experience in the Selected Neighborhood Parks

Since this study aims to understand to what extent the use of UGS affects the user's experience of nature in places where urbanization is intense, the spatial characteristics and the nature experience potentials of the three selected neighborhood parks were analyzed in the previous section. This section explains the nature experience workshop that was held in these parks to understand the user's nature experience.

Workshops allow participants to express their thoughts on a particular topic in different ways and give the researcher detailed information about the topic (Storvang, Mortensen, and Clarke 2018). In this context, the workshop method was used to understand the user's nature experience in the three selected neighborhood parks. Although there is no consensus on the number of workshop participants, 6–12 participants are recommended as the optimal group size (Brown 2022). Considering this group size, the number of participants in the nature experience workshop was determined to be 6–12 participants. In this direction, for the nature experience workshop material content, nature experience activity cards and user observation reports were prepared within the scope of the three experiences and 25 attributes of the experience-based framework of biophilic design. In addition, a user empathy map, one of the user experience (UX) methods, was adapted to the study to understand the individual nature motivations of the participants and their individual nature experiences after the workshop. In the three selected neighborhood parks, first the nature experience activities were carried out, and then user empathy maps were completed by participants using the self-report technique.

This section explains the nature experience workshop, the analysis of the collected data, the findings, and the discussion.

5.5.1. The Nature Experience Workshop Materials

The nature experience workshop materials include mainly nature experience activity cards, user observation reports, and user empathy maps. The nature experience cards and the user observation reports were prepared in three sections within the scope of the experience-based framework of biophilic design: direct experience of nature, indirect experience of nature, and experience of space and place. In addition, the attributes used in the nature experience cards in this context are shown in Figure 5.34.

		
Direct Experience of Nature	**Indirect Experience of Nature**	**Experience of Space and Place**
- Light - Air - Water - Plants - Animals - Landscapes - Weather - Views - Fire	- Images - Materials - Texture - Color - Shapes and forms - Information richness - Change, age and the patina of time - Natural geometries - Simulated natural light and air - Biomimicry	- Prospect and refuge - Organized complexity - Mobility - Transitional spaces - Place - Integrating parts to create wholes

Figure 5. 34. Selected attributes of biophilic design for the workshop materials (Source: Prepared by the author)

Figure 5. 35. The nature experience cards prepared for the nature experience workshop (Source: Prepared by the author)

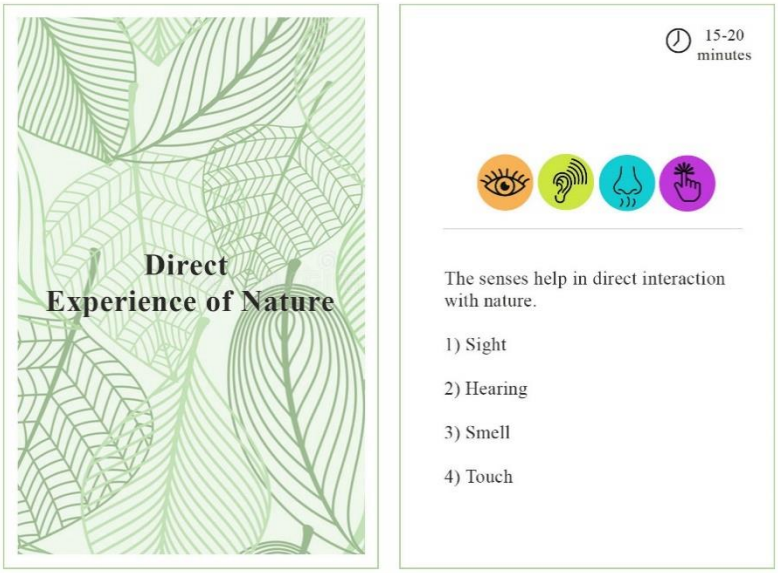

Figure 5. 36. The information card for the direct experience of nature (Source: Prepared by the author)

In the direct experience of nature part of the workshop, five nature experience cards were prepared, one with an explanation (Figure 5.36) and four with activity instructions (Figure 5.37). Since the senses play an effective role in the direct experience of nature, these cards were prepared within the scope of the four senses: sight, hearing, smell, and touch. As there is no natural element for the sense of taste in the selected parks, taste was not included in this scope. In the section on direct experience of nature, some attributes of biophilic design defined within the scope of direct experience of nature and indirect experience of nature were evaluated together. In the selection of these attributes, the nature experience potentials of the parks selected and the availability of suitable conditions for the participant to experience these attributes were considered. In this context, the selected attributes are water, plants, animals, and landscapes from the direct experience of nature and images, materials, color, and texture from the indirect experience of nature.

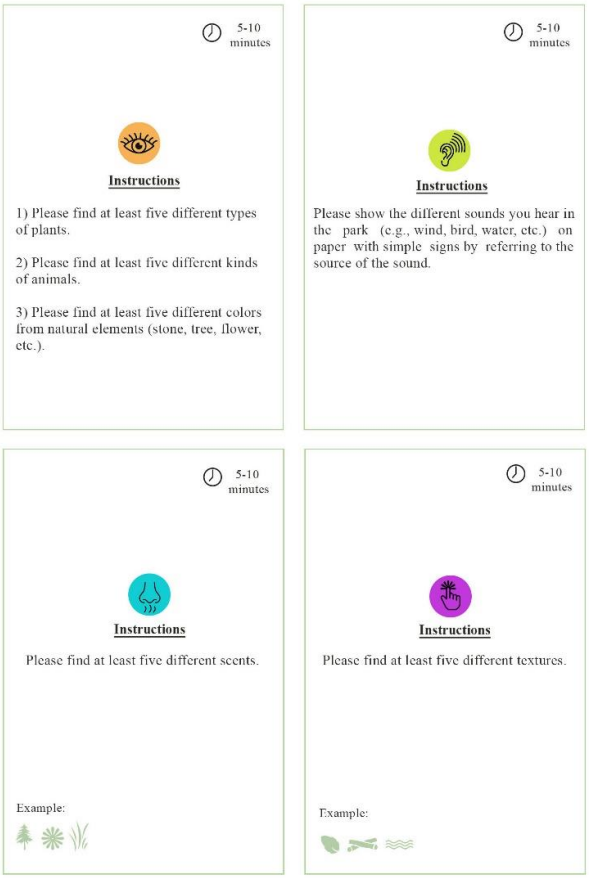

Figure 5. 37. Activity cards for the direct experience of nature
(Source: Prepared by the author)

In addition to the nature experience activity cards, a sound map and a user observation report (Figure 5.38) were prepared to be used in the implementation of the instructions on the experience cards. The sound map, which was prepared for the implementation of the instruction written on the hearing card, was adapted from Joseph Cornell's (2015) sound map activity study. An average of 15-20 minutes was determined for the completion of the instructions of the direct experience of nature experience cards.

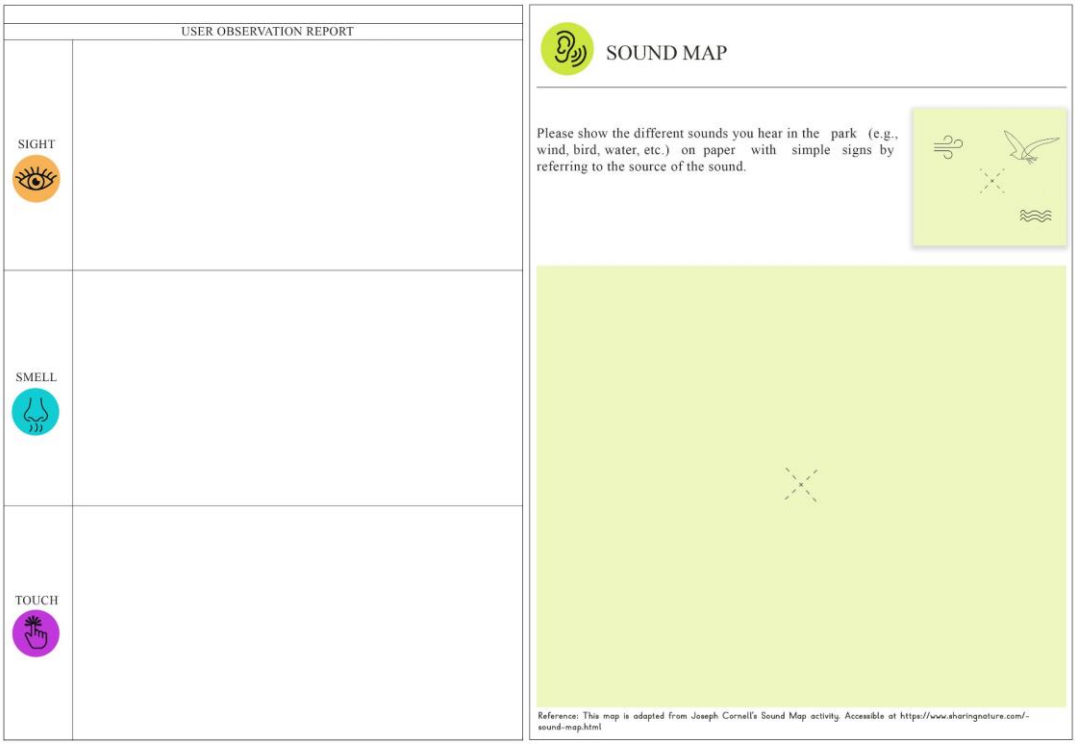

Figure 5. 38. The user observation report and Sound map
(Source: Prepared by the author)

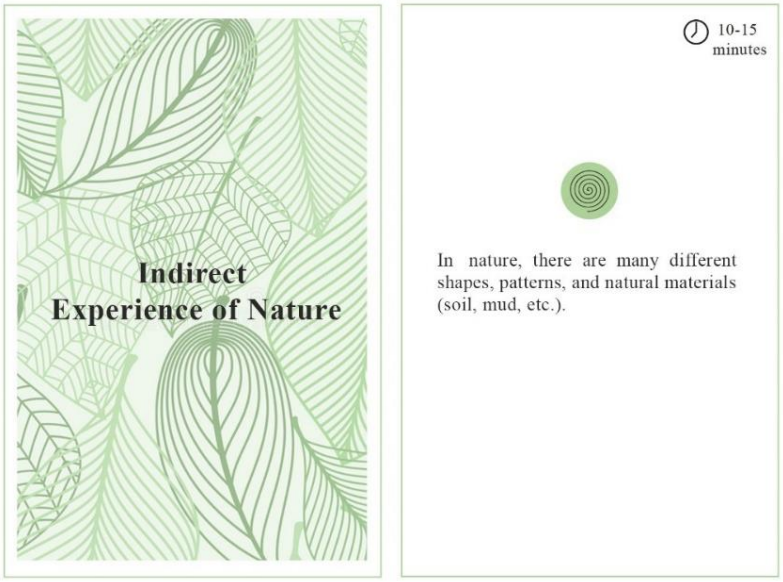

Figure 5. 39. The information card for the indirect experience of nature
(Source: Prepared by the author)

The materials for the indirect experience of nature part include the information card (Figure 5.39) and user observation report (Figure 5.40). The user observation report was adapted from Marchilli-Barker's (2013) "patterns in nature" worksheet, which is prepared to find patterns in nature. Since the attributes of the indirect experience of nature in the biophilic design are related to nature connotations, images of basic shapes and forms that are relatively easily found in nature were added to the user observation report, and it was expected of the participants to find these shapes in the selected parks. Furthermore, blank spaces were provided in the user observation report for participants to draw any shapes, forms, or patterns they observed in the parks. In the preparation of this user observation report, images, shapes and forms, and natural geometries attributes, which are defined by the indirect experience of nature of the biophilic design, were used. An average of 10-15 minutes was determined for the completion of the instructions on the nature experience cards prepared for the indirect experience of nature.

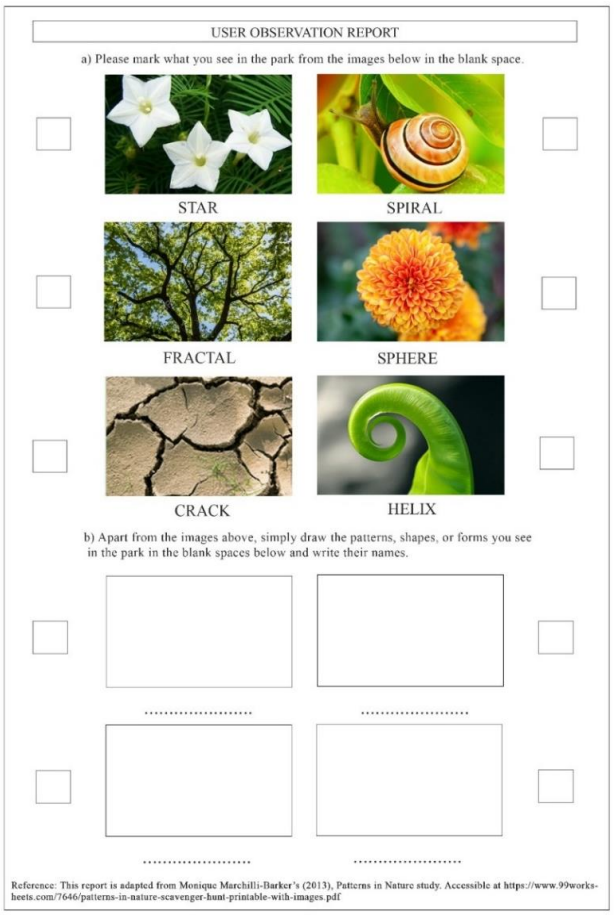

Figure 5. 40. User observation report for the indirect experience of nature
(Source: Prepared by the author)

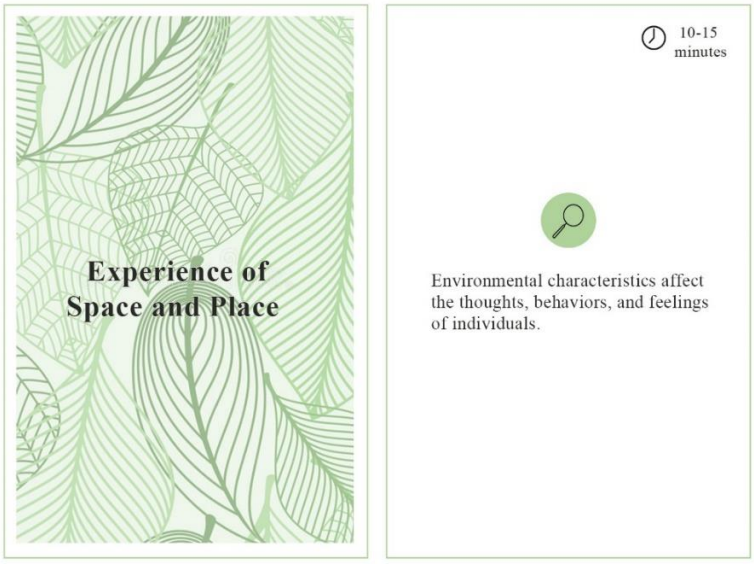

Figure 5. 41. The information card for the experience of space and place
(Source: Prepared by the author)

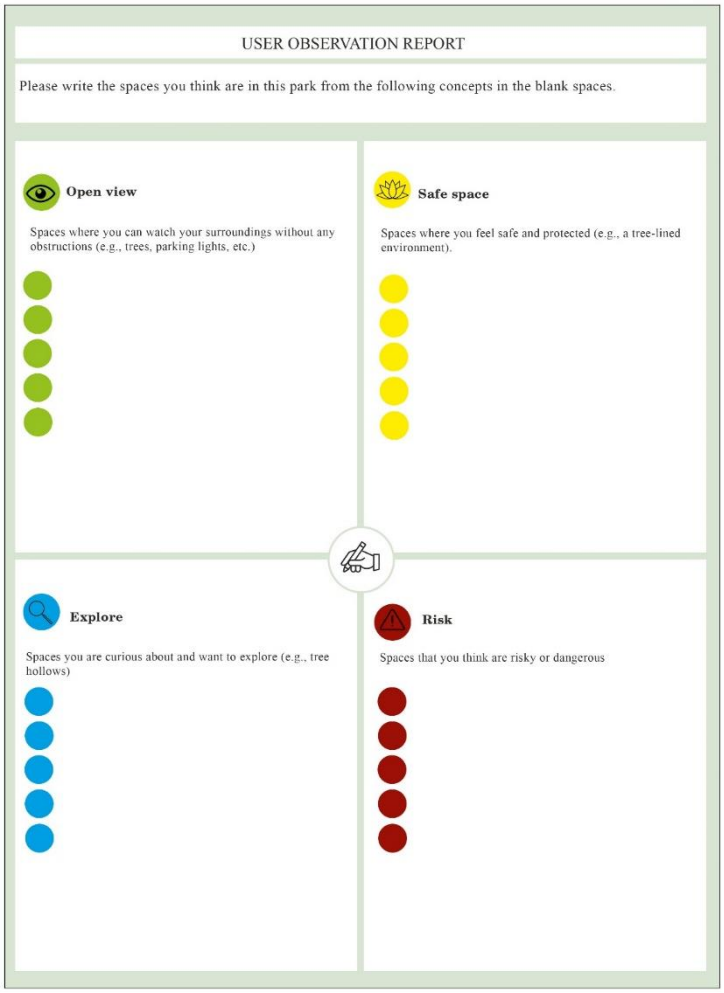

Figure 5. 42. User observation report for the experience of space and place
(Source: Prepared by the author)

Lastly, for the part of the experience of space and place, an information card (Figure 5.41) and the user observation report (Figure 5.42) were prepared. In this context, four questions were prepared for the user observation report, considering the attributes of the experience of space and place. Participants were expected to answer these questions by observing the park. In the preparation of these questions, prospect and refuge, mobility and organized complexity attributes, which are defined by the experience of space and place in biophilic design, were used. An average of 10-15 minutes was determined for the completion of the instructions on the nature experience cards prepared for the experience of space and place.

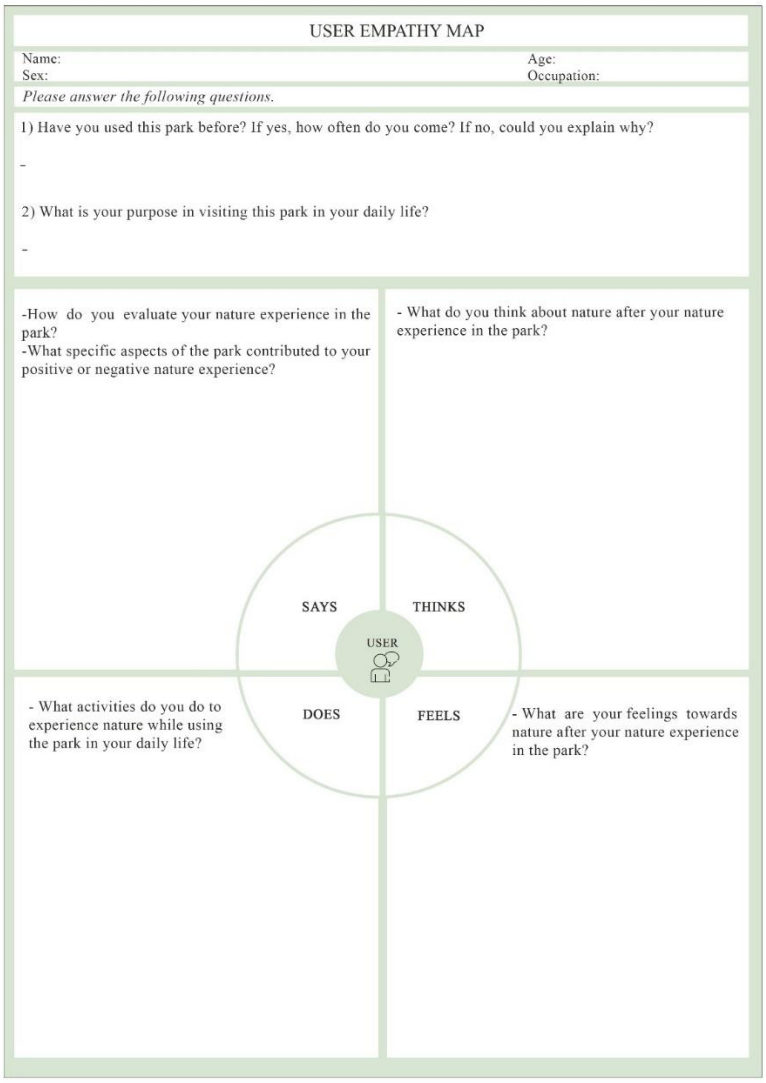

Figure 5. 43. User empathy map
(Source: Prepared by the author)

The last of the nature experience workshop materials is the user empathy map (Figure 5.43). This map was prepared by adapting the empathy map, which is one of the UX methods and allows for understanding the feelings and thoughts of the user. The questions asked in the user empathy map were prepared to understand participants' frequency and purpose of using the parks in their daily lives, their thoughts and feelings toward nature, and how they evaluated their nature experiences in the parks after the workshop.

5.5.2. Participant Selection

For the nature experience workshop participants, only those residing in the Bostanlı neighborhood and over the age of 18 were contacted. The criterion for living in the Bostanlı neighborhood was determined to understand the purpose and frequency of visiting these three parks in the neighborhood where the participants live. In addition, it was assumed that the participants were familiar with the three selected parks, so they would evaluate their nature experiences in the parks in terms of their previous experiences of park usage. The number of participants for the nature experience workshop was determined at 6–12 people, and a balanced number of men and women was considered in this process.

First, a poster (Figure 5.44) was prepared for the nature experience workshop during the finding participant process. During this process, a non-governmental organization that carries out activities related to nature supported the poster's distribution by sharing it on their social media accounts. In addition, the selected parks were visited twice, and daily users of the parks were informed about the event. However, after these visits, none of the park users could be found to participate in the workshop.

Figure 5. 44. The nature experience workshop poster
(Source: Prepared by the author)

The process of finding participants for the nature experience workshop took four weeks in total. In this process, the author disseminated the event poster within her personal network and received support from the non-governmental organization. As a result, a total of six participants, consisting of three women and three men, were found, and the minimum number of participants was provided.

5.5.3. The Nature Experience Workshop

Before the event day of the nature experience workshop, a phone call was made with the participants, and their participation status was clarified. However, shortly before the start of the workshop on the day of the event, three participants informed the author that they would not be able to attend. First, the daily users in the park where the workshop would start were informed about the workshop. Four of these users, who live in the Bostanlı neighborhood, agreed to participate in the workshop. Thus, the nature experience workshop was carried out with a total of seven participants: four women and three men (Table 5.4).

Table 5. 4. Participant information

Code Name	Sex	Age	Occupation
P1	Female	18	Student
P2	Female	26	Teacher
P3	Female	27	Foreign Trade Specialist
P4	Female	50	Officer
P5	Male	18	Student
P6	Male	32	Computer Technician
P7	Male	56	Officer

The nature experience workshop started at the appointed time. Workshop activities started in the Adnan Saygun Park, then continued in the Hıfzı Veldet Velidedeoğlu Park, and the workshop was completed in the M. Senai Ertekin Park. Since it is necessary to go from one park to another during the workshop, the walking distance between the parks was considered a criterion in the selection of these parks. Before the workshop activities started, the participants were informed about their anonymity protection, the purpose of the study, the workshop program, and the workshop materials. Afterwards, the participants filled in user observation reports according to the instructions written on the cards for direct experience of nature, indirect experience of nature, and

experience of space and place, respectively. After the activities in each park were completed, participants also filled out user empathy maps. The same activities were carried out in the same order, and a total of 30 to 45 minutes were spent in each park. The event took two and a half hours in total and was completed in the time determined before the event. At the end of the event, a thank-you card and tree seeds were given to the participants for their participation in the event.

Table 5. 5. The nature experience workshop program

Activity	**Time**
Informing the participants about the workshop	5 minutes
The activities of the direct experience of nature	15-20 minutes
The activities of the indirect experience of nature	10 minutes
The activities of the experience of space and place	10 minutes
Filling in the user empathy map	5-10 minutes
Walking between selected parks	5-10 minutes
Thank-you card distribution	5 minutes

Figure 5. 45. Images from the nature experience workshop
(Source: Prepared by the author)

During the workshop, the participants were observed, observation notes and photographs were taken, and conversations were held with the participants about the workshop activities at the end of the activities. As a result of the observations, it was understood that the motivation of some participants at the beginning of the workshop decreased gradually during the workshop period. Initially, these participants carried out the nature experience card instructions by walking around the park and observing. However, later in the workshop, it was observed that they sat in a place with limited visibility in the park and filled out the user observation reports. On the other hand, according to the information obtained after conversations with participants, no change was observed in the motivation of the participants, who have an individual motivation toward nature, during the workshop.

5.6. Findings

After the nature experience workshop was carried out with the participation of seven participants living in the Bostanlı neighborhood, user observation reports and user empathy maps were analyzed. In the user empathy maps, there are questions to understand the frequency and purpose of the participants' visits to the selected parks. These questions were prepared to understand how often and for what purpose the participants use the selected parks in their daily lives. Accordingly, most of the participants stated that they use Adnan Saygun Park and Hıfzı Veldet Velidedeoğlu Park relatively more frequently compared to M. Senai Ertekin Park due to their walking distance, public transportation connections, and proximity to the coast in their daily lives. Furthermore, most of the participants stated that they visit Adnan Saygun Park and Hıfzı Veldet Velidedeoğlu Park 2-3 times a month, while the majority of them stated that they do not use M. Senai Ertekin Park. Examining purpose for which the participants visit these three selected parks in their daily lives, most of the participants visit the parks for the purpose of resting and socializing. In addition, one participant stated that she uses the Hıfzı Veldet Velidedeoğlu Park for a nature experience, and another participant stated that she uses the Adnan Saygun Park for relaxation.

In addition to these, the user observation reports filled out by the participants during the nature experience activities, which took place in three parts: direct experience of nature, indirect experience of nature, and experience of space and place, were analyzed. In this context, it was examined to what extent the participants were able to follow the instructions given to them in the parks. Although the lower limits were specified (e.g., find at least three colors) on the activity cards given to the participants for these activities, the participants preferred to write as many design elements as they could find in the park for all three parks. The main purpose of these activities is to understand to what extent the participants have access to the design elements in the parks to carry out the instructions given to them for the nature experience activities. In other words, the aim is for the participants to do activities to experience nature in those parks before evaluating their nature experiences in the selected parks. In order to understand the nature experience potentials of the selected parks, in the previous sections, the parks were examined within the experience-based framework of biophilic design. Therefore, these activities do not aim to present the current nature experience potentials of the parks in detail. The

quantitative values in these analyses reveal the extent to which the design elements that participants need to interact with nature in parks differ from each other based on participant observations.

For the direct experience of nature part, which is the first stage of the nature experience workshop, the user observation reports filled out by the participants were analyzed. In this direction, the extent to which the parks offer diversity in terms of the existing design elements for direct interaction with nature within the scope of the four senses was examined. In all three parks, most of the participants cited the trees and animals in the park for the sight instructions. For the sense of hearing, most of the participants stated the sound of birds and water as natural sounds and traffic sounds as artificial sounds in the Adnan Saygun Park. Regarding the Hıfzı Veldet Velidedeoğlu Park, most of the participants stated traffic noise, tram sound, and ferry sound as artificial sounds, while only bird sound was stated as a natural sound. Besides, regarding the M. Senai Ertekin Park, most of the participants stated that they mainly heard bird sounds and dog sounds. Regarding the sense of smell, most of the participants reported the smell of soil and grass in all three parks. Lastly, in the sense of touch, most of the participants stated trees, tree leaves, and grass for all three parks. As can be seen in the park analyses in the previous sections, although the spatial characteristics of the parks relatively differ from each other, there are no prominent differences between the design elements found for users' nature experiences in all three parks. Therefore, the quantitative values expressed within the scope of the four senses in Figure 5.46 support this finding by showing that the design elements offered by the three parks to the participants for the direct experience of nature are only slightly different from each other.

Figure 5. 46. The number of design elements found for the direct experience of nature in the parks
(Source: Prepared by the author)

In the indirect experience of nature part, the participants tried to find the basic shapes, forms, and patterns found in nature in the parks. As in the first part of the workshop, there are only slight differences between the parks in the results of this part (Figure 5.47). In addition to shapes and forms, the participants mostly drew the patterns found in the natural elements in the park (e.g., cones, tree trunks, etc.) and the patterns found in the ground pavement in the parks in the blanks on the user observation reports.

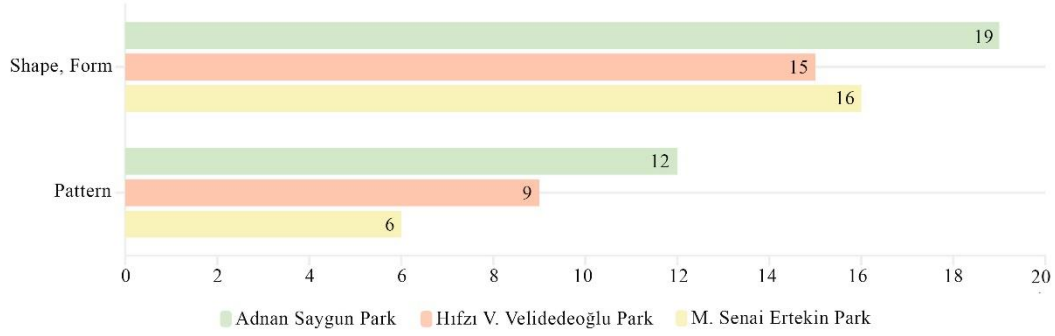

Figure 5. 47. The number of design elements found for the indirect experience of nature in the parks
(Source: Prepared by the author)

In the analysis of the user observation reports of the experience of space and place, the titles "open view" and "safe space" stand out in the parks (Figure 5.48). However, these two titles do not show a relatively prominent difference in quantitative terms between the parks. For all three parks, most of the participants specified the benches under the trees as safe areas, and they specified the park's lawns and seating areas for open views. Regarding perceived risk factors or areas in the parks, most participants expressed concerns about the surrounding environment. Among these, construction sites and high-traffic streets were frequently emphasized. In this context, while most of the participants stated the construction site for Adnan Saygun Park, most of the participants also specified high-traffic streets for Hıfzı Veldet Velidedeoğlu Park, and there is no prominent factor in this context for M. Senai Ertekin Park. For the explore title, the spaces that the participants want to explore or are curious about in the parks are quite few compared to other titles. Although most of the participants did not write any design elements for this title, plant species and their characteristics and animal houses (e.g., cat houses and bird houses) stand out among the participants' statements.

Figure 5. 48. The number of design elements found for the experience of space and place in the parks
(Source: Prepared by the author)

As emphasized before, the purpose of these activities is not to provide a detailed analysis of the nature experience potentials of the parks, but to determine to what extent

the user's nature experience differs according to the design elements of the parks. As a result, when comparing the outcomes of the three parts of the nature experience workshop, the parks generally offer a similar variety of design elements that allow users to experience nature.

In the nature experience workshop, after the activities in the parks were completed, the questions on the user empathy maps were answered by the participants using the self-reported technique. Thematic analysis was used in the analysis of the user empathy maps prepared to understand the user's needs, thoughts, and feelings about the nature experience in the parks. The thematic analysis was implemented using MAXQDA software, following six steps suggested by Braun and Clarke (2006): familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. First, the user empathy maps, workshop observation notes, and user observation reports were read in detail. Afterward, participant transcripts were produced from the workshop materials of the participants. The codes were determined after careful and repetitive reading of these transcripts. After the coding was completed, possible themes within the scope of the research questions were determined. As a result of repeating the theme determination process, general themes were determined. Consequently, three themes were identified: "The Meaning of Nature, The Sensory Experience of Nature, and The Role of the Neighborhood Park's Spatial Characteristics."

5.6.1. The Meaning of Nature

The Meaning of Nature theme is about the participants' feelings and thoughts towards nature. Since there is no common definition for the concept of nature, the definition of nature varies according to individual definitions. Accordingly, some participants expressed admiration for the richness and uniqueness of nature.

"I feel that I have a high sense of admiration for nature because every living being in nature is unique." (P6)

"I think about how beautiful everything in nature is. In the face of this beauty, my admiration for nature increases." (P5)

Some of the participants expressed nature as a separate entity independent from human life. This view was explained by some participants by stating that nature is an entity that must be protected.

"I think that every living thing in nature should always have a living space. I believe that we should always protect nature for the existence of their living spaces." (P4)

Some of the participants explained this sense of protection by stating that nature must be completely free of human intervention.

"I think there should be no human intervention for the protection of nature." (P7)

Some participants stated that nature is essential for human life and that people need nature to continue their lives.

"I think that nature has an aspect that reminds people of their essence, and therefore people need nature." (P6)

"Nature is more of a necessity for humans than a source of pleasure." (P5)

"I believe that humans need nature. For this reason, I think we need parks that provide nature experiences in order to be more engaged with nature in urban life." (P3)

For some participants, nature was expressed as a source of peace to get rid of the stress of daily life and feel peaceful.

"I feel peaceful after my nature experience in the park." (P1)

"I feel peaceful when I focus on the sound of nature." (P6)

Most of the participants also stated during the workshop that they perceive nature as distinct from urban life and that the word "nature" makes them think of wild nature.

"Since the parks are designed areas, they do not look natural and do not remind me of nature." (P6)

"Nature means only wild nature to me." (P4)

In this direction, some participants defined nature as a separate entity that is far from their daily lives and that they long for.

"I feel like I miss nature. Because I do not have a life in touch with nature in the city." (P2)

"I feel like I miss nature all the time, as I live in the city." (P1)

5.6.2. The Sensory Experience of Nature

This theme is about the participants' direct interaction with nature in the parks. This theme has been evaluated in relation to the direct experience of nature, which is one of the three experiences of biophilic design. Interaction with nature is seen as a prerequisite for the nature experience (Gaston and Soga 2020). Although there are different ways of interacting with nature, direct interaction with nature through the senses is seen as the most common among them. Most of the participants stated that they often interact with nature directly while talking about their nature experiences both during the workshop and in their daily lives.

Some of the participants expressed their opinions about the effect of the sense of sight on their interactions with nature.

"In my daily life, I mostly spend time sitting in the park and watching the trees around me to feel relaxed." (P4)

"When I go to the park, I like sitting in the park and spending time watching the plants around me." (P1)

"In my daily park experience, I usually sit on the grass with my friends and watch the surroundings." (P5)

Some of the participants referred to biodiversity in their statements about the sense of sight.

"When I visit the park, I observe the natural vitality around me. I enjoy observing the various living beings that inhabit the park." (P6)

“I like to play with the animals in the park and also enjoy observing living beings in the surroundings.” (P2)

Some of the participants emphasized the role of hearing both in their daily nature experiences and nature experiences in the park. The sounds of the wind and the water stand out among those mentioned in this context.

“When I go to the park, I listen to the wind blowing through the trees.” (P4)

“Hearing the water sound in the park gives me peace.” (P5)

In terms of sense of smell, some of the participants stated that the smell of grass in the park and different scents of flowers play a role in their nature experiences.

“Whenever I visit a park, I usually sit on the grass and try to feel the space. Also, I try to perceive the scents of flowers around me.” (P3)

In addition to these, some of the participants stated that the textures of the natural elements in the park are generally effective in their expressions about the sense of touch.

“When I go to the park, I sit on the grass and touch it because touching the grass makes me feel better.” (P2)

5.6.3. The Role of the Neighborhood Park's Spatial Characteristics

This theme is related to the spatial characteristics of the parks that affect the nature experience of the participants in the parks. During the workshop, most of the participants frequently emphasized that quietness is a prerequisite for them to feel that they are in nature and to experience it. For this, they stated that especially the parks should be away from everyday sounds reminiscent of urban life, such as traffic noise and construction noise.

“In order to experience nature, it is necessary to be away from the city and especially the noise.” (P2)

“The peace and calm of the park positively affects my nature experience.” (P4)

“The loud traffic noise that can be heard in the park negatively affects my nature experience.” (P3)

“Parks away from the city's noise appear more attractive to me. Hearing car sounds while sitting in the park distracts people from the nature experience in the park.” (P6)

“I can notice the surroundings better in parks where there is no noise, and I can feel that I am in nature.” (P5)

“When I spend time in the park, I do not feel I am in nature because there are lots of external stimuli, such as traffic noise.” (P2)

Natural elements play an important role in the nature experience. Some participants emphasized the effect of vegetation in their nature experiences in parks.

“The insufficient number of trees in the park is a disadvantage for the nature experience.” (P1)

“There is natural vitality and diversity in the park; however, the park is insufficient in terms of plant species diversity.” (P6)

“The plant diversity of this park is beautiful. I think this has a positive effect on my experience of nature.” (P7)

Park sizes affect other spatial characteristics of the park as well. Some participants associated the park's size with its vegetation and expressed that the situation affected their individual nature experiences.

“The fact that this park is large provides an important advantage in terms of plant diversity and my nature experience.” (P3)

“I consider the fact that this park is small and that there are few trees as insufficient in terms of my nature experience.” (P1)

“This park is small, and its vegetation is insufficient for the nature experience.” (P7)

The accessibility of the park also affects the frequency of visits and use of the park. In other words, it affects the time spent in the park. Some of the participants evaluated the parks in terms of accessibility and expressed the effect of this on their nature experiences.

“The park's accessible location allows me to easily access the park and enjoy nature, which is an important advantage for the nature experience.” (P3)

In addition to these, the park's unique features can contribute to a strong sense of place. Therefore, this is especially important in terms of the nature experience in the park. Some of the participants evaluated the parks in terms of uniqueness in this context.

“All parks are similar in terms of the design elements and service they offer.” (P7)

“The fact that the park does not have a unique feature and is almost the same as other parks did not create a special feeling for me.” (P4)

5.7. Discussion

In this study, three selected neighborhood parks were analyzed in terms of their nature experience potentials using the experience-based framework of biophilic design. In addition, the nature experience workshop was conducted in the selected parks to understand the users nature experiences. In this section, the nature experience potentials of the parks and the analysis findings of the nature experience workshop are discussed within the scope of The Meaning of Nature, The Sensory Experience of Nature, and The Role of the Neighborhood Park's Spatial Characteristics themes.

The Meaning of Nature

In the participants' statements, the feelings and thoughts towards nature differ from each other. These differences mainly relate to how the participants consider the connection between nature and human life. As is emphasized in the nine biophilia values, humans do not have a single predisposition toward nature (Kellert 1993). The diversity of the participants' feelings and thoughts toward nature supports this claim. When this situation is evaluated within the scope of the user's nature experience in UGS, it makes it difficult to define a one-type user nature experience.

In addition to these, one of the noteworthy points among the participant views is that most of the participants stated that they consider parks to be artificial spaces rather

than natural spaces because they are designed spaces. As a result, most of the participants stated that standard design practices are used in the park designs and that the parks are similar to each other. The emphasis on "naturalness" in these views affects people's environmental preferences, as previously emphasized in the environmental preference theories (Appleton 1975; Orians and Heerwagen 1992). Therefore, the participants' perception of "naturalness" can be interpreted as an effective factor in their preference for and use of the parks. In other words, this is also an effective factor in their nature experiences in the parks, either directly or indirectly.

The Sensory Experience of Nature

The senses play an effective role in the direct interaction with natural elements (e.g., plants, water, etc.). While the direct interaction with nature through the senses is an integral component of the direct experience of nature, it also allows the biophilic effects to be felt intensely (Beatley 2016). The majority of the participants emphasized that they interacted directly with nature while expressing their nature experiences both in their daily lives and during the workshop. Besides, they expressed the role of the senses of sight, hearing, smell, and touch in their nature experiences.

The sense of sight plays an important role in the visual experience of nature. Most of the participants emphasized vegetation, especially trees, and animals in this context. In direct interaction with nature, another essential sense is hearing. The participants expressed their views in the context of natural and artificial sounds. Most of the participants stated that they mostly enjoyed the natural sounds in the parks, such as the sounds of water, wind, birds, and dogs. Besides, most of the participants stated that artificial sounds, such as traffic or construction noise, disrupted the quiet environment they needed for their nature experience. In addition to these, there are statements about the sense of smell in some of the participants' expressions. Odors play an important role in people's use of space, and natural odors (e.g., odors of flowers, cut grass, etc.) generally arouse a common appreciation in people (Franco, Shanahan, and Fuller 2017). Most of the participants commonly emphasized the grass and soil scents, as well as flower scents, regarding the scents found in the selected parks. Lastly, there are some participants' statements about the role of the sense of touch in their nature experiences in the parks. Most of the participants expressed tactile sensations through contact with trees, tree leaves, grass, and animals in the parks.

When evaluating the views of participants on all four senses, it is noticeable that the design elements for direct interaction with nature in the parks are not diverse, and most of the participants hold similar views regarding these elements in all three parks. In addition, in the nature experience workshop, which was conducted in the context of the experience-based framework of biophilic design, participants emphasized the direct experience of nature more often in their statements compared to the other two experience titles. Therefore, this shows that the parks support a uniform and limited interaction with nature. However, it is important to support different interactions with nature (Hartig et al. 2014; Keniger et al. 2013) to encourage users nature experiences in the parks.

The Role of the Neighborhood Park's Spatial Characteristics

The spatial characteristics of the parks affect the user's experience of nature (Dempsey 2012; Zhang and Zhou 2018). In this context, the main park characteristics emphasized by the participants regarding the nature experiences in the parks are quietness, vegetation, size, accessibility, and sense of place.

During the workshop, most of the participants frequently emphasized the criterion of quietness among these characteristics. Most of the participants stated that in order to experience nature, they needed a quiet environment free of artificial and noisy sounds such as traffic and construction. In this context, for the Hıfzı Veldet Velidedeoğlu park, which is close to the main road, most of the participants expressed that traffic noise negatively affects their nature experiences in the park. In addition, some participants stated that they were disturbed by the construction noise coming from the construction site near the Adnan Saygun Park. In contrast, for the M. Senai Ertekin Park, which has residential areas around it, most of the participants stated that the park is far from the noise of the city and that the silence in the park positively affects their nature experiences.

For the vegetation, the participants evaluated the parks in terms of the diversity of plant species and the number of plants and stated the effect of park vegetation on their nature experiences. Regarding this, most of the participants preferred the vegetation of the Hıfzı Veldet Velidedeoğlu Park to the other two parks since it generally contains various numbers and types of plants. Considering that vegetation has a positive effect on the preference of a place, this can be interpreted as meaning that it is also effective in influencing the park preferences of the participants.

In addition, some participants evaluated the size of the parks in terms of their vegetation. Since the size of the parks is one of the important factors affecting park visitation (Tu et al. 2020), this characteristic can be interpreted in connection with the users' nature experiences in the parks. In this context, most of the participants preferred the vegetation of the Hıfzı Veldet Velidedeoğlu Park, which is larger than the other two selected parks and has various numbers and types of plants compared to the other two parks. On the other hand, for the M. Senai Ertekin Park, which is smaller than the other two parks, most of the participants stated that the number and diversity of plants in the park were insufficient compared to the other two parks.

Another factor affecting park visitation and use is accessibility. Some of the participants evaluated the accessibility of the parks in terms of walking distance, proximity to public transport connections, and proximity to the coast. In this context, most of the participants stated that they use the Adnan Saygun Park and the Hıfzı Veldet Velidedeoğlu Park more frequently in their daily lives compared to the M. Senai Ertekin Park because they meet these criteria.

Lastly, one of the spatial characteristics emphasized in this theme is a sense of place. Some of the participants stated that in this context, the parks did not create a different feeling for them and that the parks were similar to each other in many respects, including both spatially and in terms of their services. They also stated that this situation caused the uniqueness criterion in the parks to not be met. These views support the finding that the design elements presented for the nature experience in the parks differ slightly from each other, although the spatial characteristics of the parks are relatively different.

Consequently, the discussion of the nature experience workshop findings provides insights into the diverse nature experiences of park users and the effects of the spatial characteristics of the parks on these experiences.

CHAPTER 6

CONCLUSION

This study aimed to understand to what extent the use of UGS in places where urbanization is intense affects the user's experience of nature and to what extent the experience-based framework of biophilic design is effective in understanding this experience.

In this chapter, the conclusions drawn from the case study findings are presented below:

In the selection of the neighborhood parks for this study, it was considered that the parks' spatial characteristics differed from each other. However, the analysis of the parks showed that their nature experience potentials differed slightly from each other in terms of the design elements found in each park, despite the initial differences considered during park selection. This situation results from a standardized design approach in parks that restricts users' different interactions with nature. Therefore, to avoid standardizing design approaches, it is essential to assess each park within its distinct characteristics while also considering spatial and surrounding factors. Furthermore, incorporating diversity, particularly in design elements (e.g., planting, water features, etc.), is important as it allows park users to engage with nature in various ways.

Within the scope of this study, the user's feelings and thoughts towards nature were considered at the individual level in understanding the user's nature experience in the park. In the findings obtained in this context, it was understood that the feelings and thoughts of the participants towards nature differed from each other. When this difference is evaluated within the scope of the user's nature experience in the UGS, it is not possible to define a standardized user nature experience. Therefore, understanding the nature-oriented tendencies, motivations, and needs of different user groups in the planning and design processes of UGS is important in terms of creating more inclusive and user-oriented UGS.

Another prominent point in the findings of the study is that most of the participants described the parks as artificial spaces far from "naturalness". In this context, the user's

perception of "naturalness" can be interpreted as effective in the user's preference for and use of UGS, as well as in the user's experience of nature. Therefore, considering the spatial and environmental factors that affect the "naturalness" perception of users in the planning and design processes of UGS can be effective in promoting the user's nature experience in these spaces. Furthermore, the inclusion of spatial and surrounding factors (e.g., vegetation, quietness, sense of place, etc.) that affect users' perception of "naturalness" in the planning and design processes of UGS are important for the adoption and development of the urban nature experience by users.

In this study, using the experience-based framework of biophilic design, it was understood that direct interaction was prominent in participants' interactions with nature in the parks. However, this finding also showed that the design elements of the parks for direct interaction with nature are not diversified. Furthermore, in the analysis of the nature experience potential of the parks, it was observed that the design elements related to the attributes associated with indirect experiences of nature varied among all three parks in comparison to the other two experience categories. However, the participants did not provide sufficient feedback regarding their indirect nature experiences in the parks. Therefore, in the design process of parks, it is necessary to first understand how different user groups interact with nature. Besides, in order to diversify this interaction, park design elements should be included in design practices by considering user perception.

In addition to the mentioned findings, the spatial characteristics of the parks that influence the nature experiences of the participants in the parks were understood within the context of this study. In this context, quietness, vegetation, size, accessibility, and sense of place characteristics came to the fore. Thus, it became evident that the nature experiences of the participants in the parks were influenced by the specific spatial characteristics of the parks. Therefore, understanding the extent to which the spatial characteristics of the parks affect the natural experience of users in the parks is important to providing suitable conditions for improving user interaction with nature in the parks.

In this context, suggestions regarding the prominent spatial characteristics of the parks are presented below:

- *Quietness:* The need for a quiet environment was frequently emphasized in the statements of the participants regarding the nature experience in the parks. The main reasons behind this need were found to be artificial sounds such as traffic noise and construction noise in the vicinity of the parks. In this context, it is important to consider the selection of park locations, ensuring they are located

away from noise-intensive areas such as high-traffic streets or construction sites. In addition, existing noise mitigation in the parks can be achieved through natural elements (e.g., tree barriers), the use of water features, and the reduction of traffic flow on the roads around the parks.

- *Vegetation:* The participants placed significant emphasis on the impact of vegetation within the parks on their nature experiences, particularly highlighting the importance of plant diversity and quantity. Therefore, it is important to use a variety of plants in parks that can increase the interest and curiosity of users towards nature. Moreover, it is important to carefully consider local plant use, water consumption, and biodiversity when selecting plant species for the parks. The use of plants that are native or well-adapted to the local climate and ecosystem can promote ecological balance, conserve water resources, and support the preservation of native biodiversity.
- *Size:* Participants expressed their views on the size of the parks in relation to the vegetation. Considering that park size is an effective factor in users' park visits, it is important to realize this feature in harmony with the vegetation of the park. In this context, it is essential to consider not only the vegetation within the park but also the overall amount of green space and the appropriate balance between different park uses relative to the park's size.
- *Accessibility:* The accessibility criterion significantly affects the visitation and use of parks. In this context, it is important to take into account the proximity of parks to residential areas, ensuring that walking distances are reasonable and accessible for community members. Additionally, facilitating easy access to parks through public transportation options can enhance the use of the parks and encourage users nature experiences. Moreover, improving park accessibility can be achieved by creating pedestrian and bicycle pathways that link the park with the neighborhood and other facilities.
- *Sense of place:* Providing a sense of place is important for creating and strengthening users' connections to places. Therefore, instead of using standard design and planning approaches for parks, it becomes essential to adopt practices that foster a distinctive sense of place for park users. In this context, integrating local identity into parks through design elements (e.g., sculptures, monuments, etc.), understanding the needs of the daily users of the park, and actively involving them and supporting their participation in the planning process can be effective.

As a result of all these findings, the opinions on the research questions of the study are presented below:

For the first question of the research, "To what extent does the use of urban green space in places where urbanization is intense affect the user's experience of nature?", the study findings showed that the spatial characteristics of the parks and their nature experience potentials had an impact on the nature experience of the participants in the parks. Therefore, it is important to understand the spatial factors that affect the user's nature experience in the design and planning process, as well as individual factors, in order for the use of UGS to play a role in promoting the user's experience of nature in places where urbanization is intense.

For the second question of the research, "To what extent can the experience-based framework of biophilic design be effective in understanding the nature experience of the urban green space user in places where urbanization is intense?", the findings showed that participants interact directly with nature in the parks. Besides, the direct interaction of the participants with nature in the parks is related to the "direct experience of nature" of the biophilic design. Therefore, it is understood that the experience-based framework of biophilic design is effective in understanding how participants interact with nature in parks. Furthermore, it has made it possible to understand the spatial characteristics that are effective in this interaction and the nature experience potential of the parks.

As a result of all these, it has been found that the spatial characteristics of the parks affect the nature experience of the participants in the parks and that the experience-based framework of biophilic design enables the understanding of the nature experience of the users in the parks. Therefore, considering that the use of UGS plays a critical role in fostering the experience of nature in places where urbanization is intense, design approaches that enhance the nature experience potentials of parks and provide suitable conditions for nature experience should be adopted instead of standard design approaches in the design of parks. Furthermore, in this process, it is important to use different methods that focus on the user experience in order to understand the changing motivations and needs of park users for their nature experiences.

The Limitations of the Study

This study presented findings on the extent to which the use of UGS in densely urbanized areas affects the user's experience of nature and how the experience-based framework of biophilic design is effective in understanding this experience. Along with these findings, the study has some limitations.

First, in this study, individual factors such as feelings and thoughts towards nature were considered when examining the user's experience of UGS. However, due to the relatively small sample size of only seven participants, the study was unable to evaluate the impact of other individual factors, such as demographic and socio-economic factors, on the user's experience of nature in UGS. Therefore, future studies with larger sample sizes can investigate the influence of these factors on the user's experience of nature in UGS.

Second, the nature experience workshop materials were prepared by considering the nature experience potentials of the selected parks. In this context, not all 25 attributes of the experience-based framework of biophilic design were used. This situation caused the participants' views on the attributes not included in the workshop materials to not be understood. Future studies can reach more detailed information from the user by using all 25 attributes of the experience-based framework of biophilic design.

Third, in this study, the use of UGS is only considered within the scope of neighborhood parks. Future research on the relationship between various types of UGS and user experiences of nature can provide additional examples in this field.

Despite these limitations, this study has provided insights into the relationship between UGS usage and the user's experience of nature in densely urbanized areas using a qualitative approach. In this context, the use of the experience-based framework of biophilic design, which focuses on increasing human interaction with nature in the built environment, has enabled both the understanding of the nature experience potentials of the parks and the understanding of the nature experience of the users' in the parks. Future research should build on these findings and address the limitations of this study to further the understanding of the impact of UGS use on users' experiences of nature.

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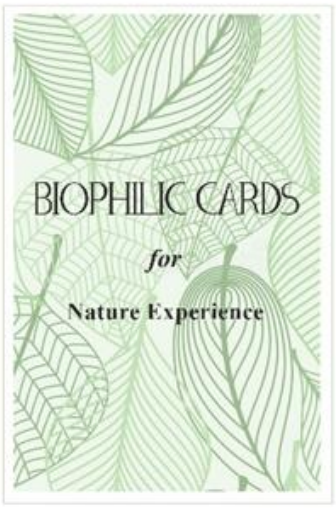
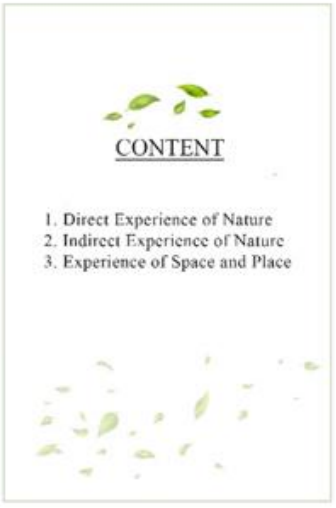
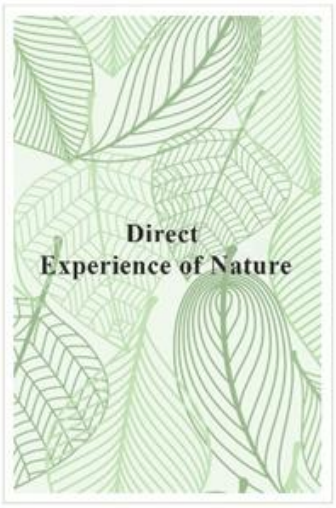
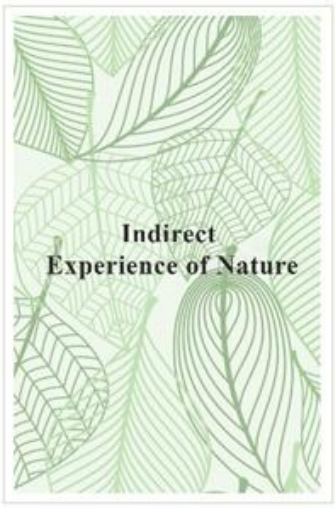
APPENDIX

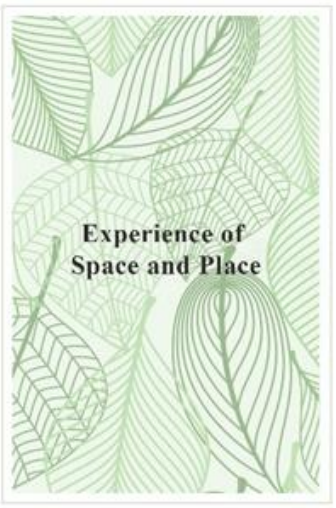
THE NATURE EXPERIENCE WORKSHOP MATERIALS











Direct Experience of Nature

15-20 minutes

The senses help in direct interaction with nature.

1) Sight

2) Hearing

3) Smell

4) Touch

5-10 minutes

Instructions

1) Please find at least five different types of plants.

2) Please find at least five different kinds of animals.

3) Please find at least five different colors from natural elements (stone, tree, flower, etc.).

5-10 minutes

Instructions

Please show the different sounds you hear in the park (e.g., wind, bird, water, etc.) on paper with simple signs by referring to the source of the sound.

5-10 minutes

Instructions

Please find at least five different scents.

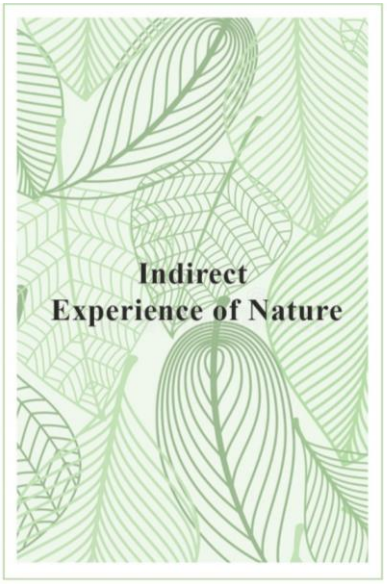
Example:

5-10 minutes

Instructions

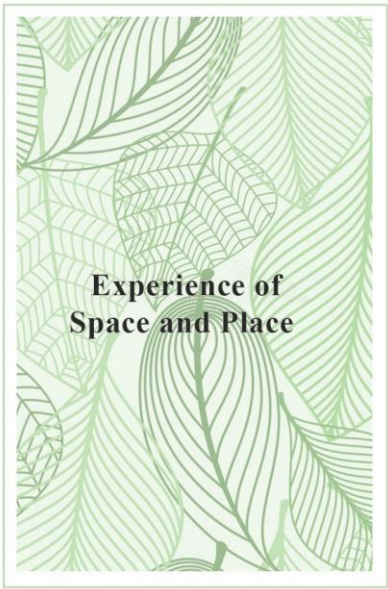
Please find at least five different textures.

Example:



10-15 minutes

In nature, there are many different shapes, patterns, and natural materials (soil, mud, etc.).



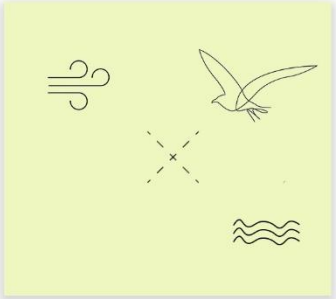
10-15 minutes

Environmental characteristics affect the thoughts, behaviors, and feelings of individuals.

USER OBSERVATION REPORT	
SIGHT 	
SMELL 	
TOUCH 	

SOUND MAP

Please show the different sounds you hear in the park (e.g., wind, bird, water, etc.) on paper with simple signs by referring to the source of the sound.



Reference: This map is adapted from Joseph Cornell's Sound Map activity. Accessible at https://www.sharingnature.com/-sound-map.html

USER OBSERVATION REPORT

a) Please mark what you see in the park from the images below in the blank space.

STAR

SPIRAL

FRACTAL

SPHERE

CRACK

HELIX

b) Apart from the images above, simply draw the patterns, shapes, or forms you see in the park in the blank spaces below and write their names.

.....

.....

.....

.....

Reference: This report is adapted from Monique Marchilli-Barker's (2013), Patterns in Nature study. Accessible at https://www.99worksheets.com/7646/patterns-in-nature-scavenger-hunt-printable-with-images.pdf

USER OBSERVATION REPORT

Please write the spaces you think are in this park from the following concepts in the blank spaces.

Open view

Spaces where you can watch your surroundings without any obstructions (e.g., trees, parking lights, etc.)

Safe space

Spaces where you feel safe and protected (e.g., a tree-lined environment).

Explore

Spaces you are curious about and want to explore (e.g., tree hollows)

Risk

Spaces that you think are risky or dangerous

USER EMPATHY MAP

Name: Age:
Sex: Occupation:

Please answer the following questions.

1) Have you used this park before? If yes, how often do you come? If no, could you explain why?

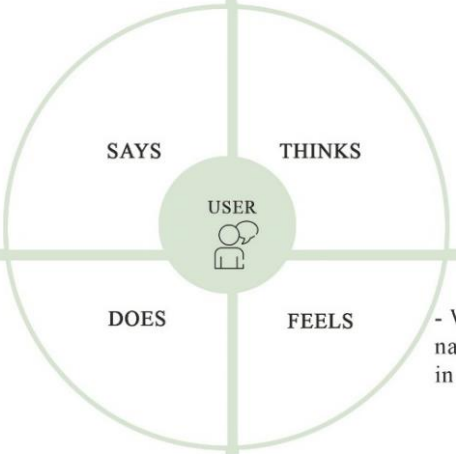
-

2) What is your purpose in visiting this park in your daily life?

-

-How do you evaluate your nature experience in the park?
-What specific aspects of the park contributed to your positive or negative nature experience?

- What do you think about nature after your nature experience in the park?



- What activities do you do to experience nature while using the park in your daily life?

- What are your feelings towards nature after your nature experience in the park?