# Environmental Attitudes and Visitor Perceptions in Borçka Karagöl Nature Park and Karagöl Sahara National Park

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*Abstract*— *This study investigates visitor profiles, perceptions, and satisfaction levels at Borçka Karagöl Nature Park and Karagöl Sahara National Park in Turkey. Using on-site surveys and statistical analyses, the research examines socio-demographic characteristics, awareness of conservation efforts, and evaluations of park services. Results indicate that most visitors are young adults with relatively high education and income levels, who show strong awareness and positive attitudes toward environmental protection. However, infrastructure shortcomings and safety concerns, particularly related to traffic congestion and wildlife, affect visitor satisfaction negatively. Socio-demographic factors such as income and education significantly influence conservation awareness and overall experience. The study highlights the need for targeted educational programs, improved infrastructure, and participatory management strategies to enhance both ecological conservation and visitor satisfaction. These findings provide valuable guidance for sustainable tourism planning and protected area management in the region.*

*Keywords*— *Protected areas, visitor perceptions, conservation awareness, sustainable tourism, visitor satisfaction, environmental attitudes.*
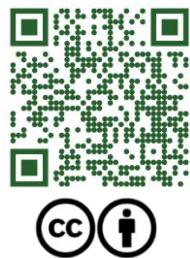
## I. INTRODUCTION

Protected areas play a vital role in conserving biodiversity, maintaining ecosystem services, and providing recreational opportunities for visitors (IUCN, 2020). Consequently, the increasing popularity of nature-based tourism has led to a growing influx of visitors to national parks and protected areas, particularly in regions with rich ecological and cultural heritage. This rise in visitation necessitates a comprehensive understanding of visitor characteristics, motivations, and perceptions to ensure sustainable use and effective management of these valuable areas (Eagles et al., 2002; Buckley, 2012; Larson et al., 2023).

Effective management of protected areas involves not only ecological and infrastructural planning but also a social dimension that accounts for visitor expectations, environmental attitudes, and behaviors (Newsome et al., 2013; Smith & Lee, 2021). Numerous studies emphasize the

importance of analyzing visitors' demographic profiles alongside their perceptions of conservation values, recreational satisfaction, and support for protection measures (Weaver & Lawton, 2007; Ballantyne et al., 2008; Zhao et al., 2022). Understanding visitor profiles enables managers to tailor educational and interpretive programs, enhance service quality, and minimize ecological pressures.

Despite growing interest in visitor-focused research globally, studies remain scarce in certain regions such as the Eastern Black Sea Region of Turkey, where mountainous ecosystems, high biodiversity, and rapid tourism development coexist (Çetinkaya & Keskin, 2021; Demir & Aydın, 2023). Borçka Karagöl Nature Park in Artvin is one such protected area that has recently attracted a significant number of domestic tourists. However, empirical data regarding visitors' socio-demographic characteristics, expectations, and perceptions of the park's conservation mission remain limited.

This study aims to explore the socio-demographic characteristics and environmental attitudes of visitors to Borçka Karagöl Nature Park and Karagöl Sahara National Park, and analyze their perceptions of the parks' conservation functions. A questionnaire-based survey was conducted on-site at both locations, and collected data were analyzed using both descriptive and inferential statistical methods. The findings are intended to inform visitor management strategies and contribute to sustainable tourism planning in these protected areas.

The remainder of this paper is organized as follows: Section 2 reviews the relevant literature on visitor studies in protected areas; Section 3 describes the study area and methodology; Section 4 presents and discusses the survey results; and Section 5 concludes with limitations and policy implications.

Understanding visitor behavior and environmental attitudes has become increasingly important for managing protected areas, especially given the global rise in nature-based tourism (Kim et al., 2022; Larson et al., 2023). Visitors to national parks and nature reserves engage in recreational activities but also significantly influence the ecological integrity and social sustainability of these areas through their perceptions, motivations, and behaviors (Torres & Momsen, 2020; Zhao et al., 2022). Consequently, numerous studies highlight the need to link visitor profiles with their conservation awareness and support for protection efforts (Weaver & Lawton, 2007; Ballantyne et al., 2008).

Recent research indicates that socio-demographic factors play a key role in shaping visitor behavior and environmental attitudes (Palomo et al., 2019; Smith & Lee, 2021). Factors such as previous outdoor experiences, personal environmental values, and perceptions of ecosystem services strongly influence how visitors perceive protected areas and their conservation missions (Kim et al., 2022; Çetin & Bilgihan, 2023). These insights assist park managers in designing targeted interpretive programs and behavioral interventions aimed at minimizing ecological impacts.

While visitor perception research in Turkish protected areas is gradually expanding, the geographic scope and depth remain limited, particularly in the biodiverse and rapidly developing Eastern Black Sea Region (Çetinkaya & Keskin, 2021; Demir & Aydın, 2023). This gap underscores the need for empirical studies focused on visitor characteristics, conservation attitudes, and their implications for sustainable management in this region.

Building on existing literature, this study focuses on Borçka Karagöl Nature Park, a heavily visited protected area in northeastern Turkey, to examine visitor perceptions of nature, conservation efforts, and the park's value. The study aims to contribute region-specific, updated data and provide recommendations for visitor management in mountainous protected areas facing growing tourism pressures.

## II.     MATERIAL AND METHODS

This study was conducted in two protected areas located in Artvin province, northeastern Turkey: **Borçka Karagöl Nature Park** and **Karagöl Sahara National Park**. These areas were selected due to their ecological importance, biodiversity richness, and increasing visitor numbers, providing an appropriate context to analyze visitor interests, perceptions, and attitudes toward conservation and recreational services.

Borçka Karagöl Nature Park is situated within the Karçal Mountains, featuring two lakes formed by landslides at elevations between 1,450 and 1,480 meters above sea level. The park covers approximately 368 hectares and was declared a Natural Park in 2002, recognized for its geological, biological, and landscape values (Artvin Forestry Directorate, 2022). The region exhibits a humid temperate Black Sea climate with an average annual precipitation of 1,268.2 mm and hosts over 900 plant taxa (Çetinkaya & Keskin, 2021).

Karagöl Sahara National Park, declared in 1994, encompasses around 3,250 hectares, with elevations ranging from 1,140 to 2,625 meters. It features a transitional climate between the Eastern Black Sea and Eastern Anatolia zones and includes diverse ecosystems such as the Karagöl lake area and the Sahara plateau (General Directorate of National Parks, 2021). Recent infrastructure developments include accommodation facilities, picnic areas, and hiking trails (Demir & Aydın, 2023).

Data were collected via face-to-face surveys conducted during the peak summer season of 2023, capturing visitor experiences during periods of high visitation. A total of 400 visitors participated, with 200 respondents sampled from each protected area using convenience sampling.

The questionnaire gathered socio-demographic information (age, gender, education, residence) and assessed visitor perceptions of infrastructure, services, conservation efforts, and overall satisfaction. Satisfaction was measured on a 5-point Likert scale (1 = very satisfied to 5 = not satisfied at all). The questionnaire items were grouped into three categories: services provided, conservation perceptions, and visit satisfaction including recommendation likelihood.

The sample size (N=400) was determined based on prior studies in protected area visitor research (Kim et al., 2022; Çetinkaya & Keskin, 2021) and practical considerations related to visitor flow. A power analysis was conducted to ensure the sample size was sufficient to detect medium

effect sizes (Cohen's d = 0.5) with 80% statistical power at a 5% significance level, suitable for planned inferential analyses.

Data were analyzed using descriptive statistics to summarize visitor profiles and satisfaction levels. Inferential analyses, including reliability tests (Cronbach's alpha), exploratory factor analysis, and regression modeling, were performed to identify factors influencing visitor satisfaction and conservation attitudes.

### III. RESULTS

Protected areas serve as fundamental components of national and international nature conservation policies (Eagles & McCool, 2002; IUCN, 1994) and are recognized as significant tourist attractions. In Europe, many national parks have been established in regions with centuries of human interaction and have become traditional and renowned tourism destinations (Job, 2008). Protected areas contribute not only to biodiversity conservation and the sustainability of ecosystem services but also offer recreational opportunities (Eagles & McCool, 2002; IUCN, 1994). Borçka Karagöl Natural Park and Karagöl Sahara National Park are key protected areas in the Artvin region, attracting substantial visitor interest.

The socio-demographic characteristics of visitors are summarized in Table 1. Both parks exhibit a similar visitor profile: approximately 62% male and 38% female; the majority (about 60-63%) are aged between 24 and 45; education level is predominantly high school or above (70-75%); and income mainly falls within the 15,000-30,000 TL range (Borçka Karagöl 40%, Karagöl Sahara 46%). These findings align with previous studies indicating that visitors to protected areas tend to be young to middle-aged adults with relatively high educational attainment (Palomo et al., 2019; Kim et al., 2022).

*Table 1. Socio-demographic characteristics of the participant*

| Feature | Borçka Karagöl NP | Karagöl Sahara NP |
|---|---|---|
| Gender | 62.5% male, 37.5% female | 62% male, 38% female |
| Age (years) | 60% aged between 24-45 years | 63.5% aged between 24-45 years |
| Education | 70-75% high school or above | 70-75% high school or above |
| Income | 40% earn between 15,000-30,000 TL | 46% earn between 15,000-30,000 TL |

Table 2 presents visitors' awareness of the protected status of the parks and their primary sources of information. A majority of visitors in both parks are aware of their protected area status (Borçka Karagöl 81.5%, Karagöl Sahara 72%). The principal information channels are social networks such as family and friends (29.5%) and media sources (27%). This underscores the importance of social interaction and digital platforms in disseminating conservation knowledge (Weaver & Lawton, 2007).

*Table 2. Visitors' Awareness of Protected Area Status and Main Sources of Information*

| Knowledge Status | Borçka Karagöl NP (%) | Karagöl Sahara NP % |
|---|---|---|
| Knowledgeable | 81.5 | 72 |
| Not Knowledgeable | 11.5 | 25 |
| Main Source of Information | Friends/Family 29.5 | Media 27 |

Visitors' evaluations of park services are outlined in Tables 3 and 4, with statistical comparisons summarized in Table 5. Both parks received high satisfaction scores for natural beauty and recreational facilities (mean scores between 1 and 2, where 1 indicates "very satisfied").

*Table 3: Visitor Evaluations of Service Areas in Borçka Karagöl Nature Park (%)*

| Service Area | Strongly Agree % | Agree % | Neutral % | Disagree % | Strongly Disagree % |
|---|---|---|---|---|---|
| Natural Beauty | 78.5 | 14.5 | 3 | 1 | 0.5 |
| Recreational Facilities | 41 | 33.5 | 13.5 | 4.5 | 3 |
| Informational Materials | 34 | 31 | 20 | 8 | 4.5 |
| Traffic Congestion (Negative) | 28.5 | 36 | 13.5 | 11.5 | 4.5 |

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However, vehicle traffic density and inadequate transportation infrastructure were perceived negatively, particularly in Karagöl Sahara (mean scores for traffic congestion: Borçka Karagöl 2.58 ± 1.58; Karagöl Sahara 2.79 ± 1.39, p = 0.004). Additionally, the cleanliness of toilets and resting areas as well as accommodation facilities were frequently criticized. These findings highlight the need for improved infrastructure and visitor management to enhance satisfaction in protected areas (Newsome et al., 2013; Eagles & McCool, 2002).

*Table 4. Visitor Evaluations of Service Areas in Karagöl Sahara National Park (%)*

| Service Area | Strongly Agree % | Agree % | Neutral % | Disagree % | Strongly Disagree % |
|---|---|---|---|---|---|
| Natural Beauty | 59 | 30.5 | 6 | 2.5 | 0.5 |
| Recreational Facilities | 30.5 | 47 | 13 | 7 | 1.5 |
| Informational Materials | 30.5 | 48.5 | 8 | 9 | 2.5 |
| Traffic Congestion (Negative) | 7.5 | 32 | 25 | 30.5 | 2.5 |

Regarding conservation efforts most visitors recognize and value protection measures, advocating for increased conservation activities. Approximately 72-81.5% of respondents acknowledge the park's protected status, consistent with prior findings on environmental awareness in protected area visitors (Palomo et al., 2019). Despite this, concerns persist about safety, particularly regarding wildlife threats and insufficient warning signs, suggesting that management should address both ecological and social dimensions of protection (Manfredo, 1992; Mose & Weixlbaumer, 2007).

*Table 5. Mean Visitor Ratings and Statistical Comparisons of Service Areas in Borçka Karagöl NP and Karagöl Sahara NP*

| Service Area | Borçka Karagöl NP (Mean ± SD) | Karagöl Sahara NP (Mean ± SD) | p (t-test) | Cohen's d | Interpretation |
|---|---|---|---|---|---|
| Natural Beauty | 1.23 ± 0.64 | 1.51 ± 0.78 | 0.012* | 0.42 | Higher satisfaction in Borçka |
| Recreational Facilities | 1.82 ± 1.07 | 1.99 ± 0.94 | 0.28 | 0.16 | No significant difference |
| Informational Materials | 2.12 ± 1.16 | 2.00 ± 1.02 | 0.43 | 0.10 | No significant difference |
| Traffic Congestion (Negative) | 2.58 ± 1.58 | 2.79 ± 1.39 | 0.004* | 0.49 | More negative in Karagöl Sahara |

Visitor attitudes toward protected areas and their satisfaction levels were analyzed based on various socio-demographic variables. Independent samples t-tests and ANOVA analyses revealed that income and education levels significantly influence both visitor satisfaction and conservation awareness. Visitors with higher income levels reported significantly greater satisfaction and awareness regarding the importance of protected areas. Additionally, a positive correlation was found between education level and visitor perception. These findings underscore the importance of considering socio-demographic characteristics in the planning and management of visitor services in protected areas (Kim et al., 2022; Palomo et al., 2019). The relevant statistical analysis results are summarized in the table below.

*Table 6. Effects of Income and Education on Visitor Perceptions and Satisfaction in Protected Areas*

| Analysis Type | Variables | Results / Statistics | Interpretation |
|---|---|---|---|
| Independent Samples t-Test and ANOVA | Visitor Satisfaction and Conservation Attitudes | $p < 0.05$ | Significant differences in visitor satisfaction and conservation attitudes |
| | Income Level and Overall Satisfaction | Higher income visitors gave significantly higher scores | Income level influences satisfaction and conservation awareness |
| Correlation Analysis | Education Level and Visitor Perception | Pearson r = 0.45, p < 0.01 | Positive correlation between education level and visitor perception |

The analysis results in the table indicate that visitors' socio-demographic characteristics play a significant role in shaping their attitudes and satisfaction levels toward protected areas. Notably, visitors with higher income levels tend to give significantly higher scores in both overall satisfaction and conservation awareness. This suggests that individuals with better economic status value the importance of protected areas more and tend to have more positive experiences in these areas.

Furthermore, there is a significant positive correlation between education level and visitor perception. As education level increases, so do conservation awareness and positive perceptions of the protected areas. This supports the idea that more educated individuals are generally more environmentally conscious and have higher awareness regarding the sustainable management of protected areas.

Overall, these findings highlight the importance of considering socio-demographic factors in protected area management. To enhance visitor satisfaction and strengthen conservation awareness, tailored information and education programs targeting different income and education groups would be beneficial.

## IV. DISCUSSION

This study provides comprehensive data on visitor profiles, conservation perceptions, and service satisfaction in important protected areas such as Borçka Karagöl Natural Park and Karagöl Sahara National Park, offering critical insights for protected area management and sustainable tourism both locally and within the global literature.

Firstly, the high awareness among visitors about the importance of protected areas and their strong support for conservation efforts align with the increasing social consciousness and environmental awareness documented in the literature (Ballantyne & Packer, 2011; Fernández-Bellon & Kane, 2019). However, the translation of this awareness into effective management policies remains limited due to deficiencies in infrastructure and safety measures. This highlights the challenges of balancing the social, environmental, and economic dimensions within the sustainability paradigm (Berkes, 2004; Reed, 2008).

Traffic congestion and inadequate transportation infrastructure cause habitat degradation and negatively affect visitor experience. These findings indicate that protected area managers need to implement more sensitive planning to balance recreational use and ecological conservation (Monz et al., 2010; Pickering & Hill, 2007). In particular, increased visitor numbers during peak tourism seasons may exceed the carrying capacity and cause habitat deterioration. Consequently, visitor management strategies such as quotas, time restrictions, and development of alternative routes could be employed (Newsome et al., 2013).

Visitors' perceptions of safety and risks related to wildlife highlight the social risks inherent in nature tourism and emphasize the importance of ensuring visitor security (Weaver & Lawton, 2007). Enhancing wildlife warning systems and visitor education programs would not only increase safety but also promote respect for nature.

Requests for preservation and promotion of local culture and traditions reflect the socio-cultural dimension of sustainable ecotourism. In the ecotourism literature, safeguarding cultural heritage and increasing local community participation are seen as critical both for economic benefits and conservation success (Stronza & Gordillo, 2008; Zhao et al., 2021). Involving local communities in these processes enhances the social legitimacy of protected areas and reduces potential conflicts (Berkes, 2004).

The influence of socio-demographic factors on visitor attitudes—especially the direct correlation between education and income levels with conservation awareness—underlines the necessity for targeted education

and awareness programs tailored to visitor profiles (Kim et al., 2022; Palomo et al., 2019). Such programs can effectively increase visitors' respect for nature and conservation behaviors.

Considering the methodological limitations of this study, expanding data collection beyond seasonal periods to include year-round and varying climatic conditions would contribute to understanding the impact of seasonal variations on management strategies (Wilson & Tisdell, 2001). Furthermore, complementing quantitative data with qualitative analyses—such as focus groups and in-depth interviews—would enable a multidimensional and profound understanding of visitor experiences (Liu & Wall, 2006).

Finally, sustainable management of protected areas is achievable only through multi-stakeholder, interdisciplinary, and participatory approaches (Reed, 2008). In this regard, strong collaborations should be established among academic institutions, local governments, civil society, and local communities. Moreover, the widespread use of digital technologies and social media can serve as effective tools for raising conservation awareness and educating visitors (Fernández-Bellon & Kane, 2019).

In summary, visitor management, infrastructure improvements, safety measures, and cultural heritage preservation in Borçka Karagöl and Karagöl Sahara protected areas require strategic planning. Long-term monitoring and participatory management practices in these areas will support both ecological and socio-economic sustainability, ensuring the protection of these areas and the enhancement of their tourism potential.

## V.    CONCLUSION

In conclusion, the visitor profiles, perceptions, and satisfaction levels in Borçka Karagöl and Karagöl Sahara protected areas provide valuable insights for their sustainable management. While the majority of visitors demonstrate high conservation awareness, infrastructure deficiencies and safety concerns negatively impact overall satisfaction. Furthermore, socio-demographic factors play a significant role in shaping visitor attitudes, highlighting the need for targeted education and awareness programs tailored to different income and education groups. Based on these findings, a multidimensional strategy involving participatory management, infrastructure improvements, cultural heritage preservation, and enhanced visitor safety is essential to ensure the ecological and socio-economic sustainability of these protected areas. Such approaches will not only safeguard natural resources but also improve visitor experiences and contribute to regional development.

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