

Article

Assessing Visitors' Understanding of River National Park Functions and Landscapes

Arne Arnberger * , Renate Eder and Hemma Preisel

Institute of Landscape Development, Recreation and Conservation Planning, University of Natural Resources and Life Sciences, 1190 Vienna, Austria

* Correspondence: arne.arnberger@boku.ac.at; Tel.: +43-1-47654-85312

Abstract: The assessment of visitor understanding and perceptions of natural landscapes and attitudes towards functions of a river national park is important for the acceptance and success of park management. The study asked 426 visitors to the Donau-Auen (Danube Floodplains) National Park in Eastern Austria about their affinity to the national park brand, their understanding of the river landscapes and attitudes towards the functions of a national park, and to what extent the visitors perceive the Danube Floodplains as a national park at all. The results show that a large proportion of respondents have some understanding of river national parks and their functions. Many respondents have a sense of being in a national park. However, for 60% of the respondents, the national park brand played almost no role in a visit to the national park. Visitors who have a higher affinity for the national park showed a stronger agreement with the functions of a national park. Those images from the Danube Floodplains National Park that depicted natural landscapes were judged by the majority of respondents to be typical of a river national park, but also meadows. Differences regarding the national park landscapes were not found among visitor affinity segments. Implications for environmental communication are presented.

Keywords: blue space; environmental communication; landscape change; national park affinity; visitor perception



Citation: Arnberger, A.; Eder, R.; Preisel, H. Assessing Visitors' Understanding of River National Park Functions and Landscapes. *Water* **2023**, *15*, 461. <https://doi.org/10.3390/w15030461>

Academic Editor: Ian Prosser

Received: 29 December 2022

Revised: 15 January 2023

Accepted: 19 January 2023

Published: 23 January 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

According to the categorization of protected areas of the International Union for Conservation of Nature (IUCN), Category II protected areas (national parks) are managed for ecosystem protection while, at the same time, providing educational and recreational opportunities for tourists and local population and supporting people's wellbeing [1]. Therefore, park managers need information on visitors' understanding of natural landscapes and attitudes towards national park functions to identify management strategies that are ecologically sound and acceptable to the park visitors. Protected natural riverscapes such as river national parks provide a range of ecosystem services and benefits to society; they are not only hotspots for biodiversity but also provide drinking water and food, regulate flood risks, and are important for environmental education, human health, outdoor recreation and nature-based tourism [2–4]. While previous research has often addressed tourists' and local residents' preferences for river landscapes [5–8], little research has analyzed visitors' national park affinity, public understanding and perceptions of and attitudes towards suburban river national parks.

1.1. Visitor Affinity to National Parks

Worldwide, the national park brand has become increasingly important in attracting visitors to explore natural environments [9,10]. National park research has found that park visitors differ, for example, in the degree of their affinity to the national park brand [9–14]. The national park affinity concept which is rooted in the travel motivation

theory [15–17] identifies visitor segments based on visitors' national park awareness and the importance of the national park brand in trip planning [9–14]. This concept has frequently been used for the tourism-induced, regional economic impact assessment of national parks [10,11,18,19], satisfaction with park facilities, services and landscape scenery, visitor loyalty and perceptions of outdoor recreation experience or attitudes towards the park and visitor management [12–14,20,21]. Studies showed that visitors with higher park affinity have a better understanding of the functions and nature conservation goals of national parks. However, research in European national parks has found that the national park brand itself has little influence on the majority of visitors' decision to visit the national park. Reasons may be that several national parks are located in or nearby urban agglomerations resulting in many local residents visiting these parks for everyday recreational activities, or these parks were traditional tourism destinations before actually being established as a national park [10,12,14,21]. Visitors who have little or no understanding of a national park may have different expectations about a national park, may not understand the park regulations and the value of natural landscapes, may show inappropriate behaviors and may pose a challenge to park management [14,21]. This study used the national park affinity concept to analyze whether visitors' understanding and perceptions of natural landscapes and functions of a national park differ per national park affinity segment in a suburban European river national park, the Danube Floodplains (Donau-Auen) National Park (DANP) in East Austria.

1.2. River Landscape Preferences and Perceptions

For a target group-oriented management, it is essential to know how the national park landscapes are perceived. Research on public river preferences has demonstrated that humans prefer larger bodies of open water, natural river landscapes, and fast-flowing streams, while they dislike dead wood in rivers, algae blooms, and muddy water [22–25]. An image-based preference study asking visitors to the DANP found that natural features, such as floodplain forests in combination with meadows or xeric alluvial biotopes, alleys of trees and gravel trails were preferred, while dense forests, open agrarian structures, and water bodies with 50% reed cover were less preferred [5]. Another Austrian study found that pupils had rather positive attitudes towards and perceptions of natural rivers; nevertheless, few of them perceived natural rivers as useless wilderness [8]. The study also used landscape images of the DANP to assess pupils' river preferences and found that pupils perceive rivers with a high-water dynamic as best for recreation, while dry river sites and riverscapes with mud, algae and litter were disliked. Similarly, other river-based studies found that respondents prefer river landscapes that create a feeling of safety and satisfy human recreational needs [22–25].

These studies did not, however, ask visitors whether their visit experience match the experience they would expect for a typical national park, whether they have the feeling of being in a national park, or if they felt that the national park is increasingly turning into a national park not influenced by humans. These questions are important, especially for Central European national parks. Many European national parks were established only at the end of the 20th century. However, these landscapes were often shaped by centuries of forestry and agriculture [13,21,26–29], and may have shaped people's landscape perceptions. The question is whether today's visitors know what a natural river landscape looks like, whether they have the feeling of being in a national park, and whether visitors with different levels of national park affinities also have different national park perceptions.

1.3. Attitudes towards National Park Functions

Public attitudes towards national park functions play an important role in the success of national parks [13,14,26–33]. Research on park-people relationships, described as the interaction between local populations and protected areas [34], found that most people have a positive attitude toward national parks. However, the local population is more critical of the establishment of national parks, fearing that restrictions on traditional land

and recreational uses and accessibility will occur and that the familiar landscape will change [26–29,34–36]. This is especially true for Central European national parks, as larger areas of these were previously managed. With the designation as a national park, these traditional land uses were gradually discontinued [26–29,34–36]. European studies on attitudes towards national park functions show that most visitors support nature conservation functions and mostly agree that national parks provide a high-quality recreation experience. However, the agreement is lower when it comes to positive regional-economic functions of the national park, continuation of traditional forestry, dead wood management, and visitor regulations [12,21].

1.4. Research Questions

Successful national park management requires information about the role the park brand plays in tourism and the visitor's understanding of national park functions and landscapes [12,14,21]. Despite the frequent use of the national park affinity concept [10–14,18–21], it appears that this segmentation concept has not been tested regarding visitors' perceptions and understanding of river national park landscapes. Such information, however, is crucial for sustainable visitor management and educational program development. In addition, this segmentation concept has rarely been applied to suburban river national parks. The Danube floodplains have always been considered an attractive excursion area for the surrounding population of Lower Austria and Vienna. The designation as a national park, however, has brought about a number of changes for tourists and the local population, ranging from changes in the landscape due to land use abandonment and increased water dynamics to changes in the visitor regulations and trail network. This study surveyed visitors to the DANP and related the national park affinity concept to visitor characteristics, attitudes towards park functions, and the coherence of the national park experience. The following research questions guided the study:

1. Do affinity segments differ in their attitudes towards national park functions?
2. Do visitors perceive the Danube floodplains as a national park at all and are there differences between the affinity segments?
3. Can visitors differentiate between natural and cultural river landscapes and are there differences between the affinity segments?

2. Materials and Methods

2.1. Study Area

In 1996, the Danube Floodplains were declared a national park. The DANP protects one of the largest natural riparian wetlands in Central Europe, which are still ecologically intact to a comparatively high degree [37]. The IUCN-category II DANP (Figure 1) is located in East Austria and extends for nearly 38 km along the Danube River from Vienna to the border of Slovakia near the City of Bratislava. The western part of the park, called Lobau with an area of 2400 hectares, actually lies within the municipal boundaries of the City of Vienna, whereas the eastern part with an area of about 7300 hectares is located in the province of Lower Austria [38]. Urban and rural settlements, industrial areas, and areas of intensive agriculture and the Danube River border the open-access national park. Close to 200,000 people live within a few kilometers of its borders, and about 2.5 million people live in the Vienna metropolitan region. The main access point of the Lower Austrian part is the village of Orth with close to 2200 inhabitants, where the main visitor center is located.

Approximately one million park visits per year were recorded about 20 years ago [39,40] and it is assumed that use loads have drastically increased since then because of settlement development [5,41]. The main period of visitation is between March and October. The Sundays experience about 2.5 times higher use levels than the average working day.

About 65% of the DANP area is covered by riparian forests, 15% by open land, including meadows, agricultural fields, pastures, flood dam vegetation, and xeric alluvial biotopes, and about 20% is covered by water. Within the open land category, the meadow is

by far the dominant land use. The meadows in the DANP are maintained and extensively managed, and the remaining agricultural land is managed organically [38,41].

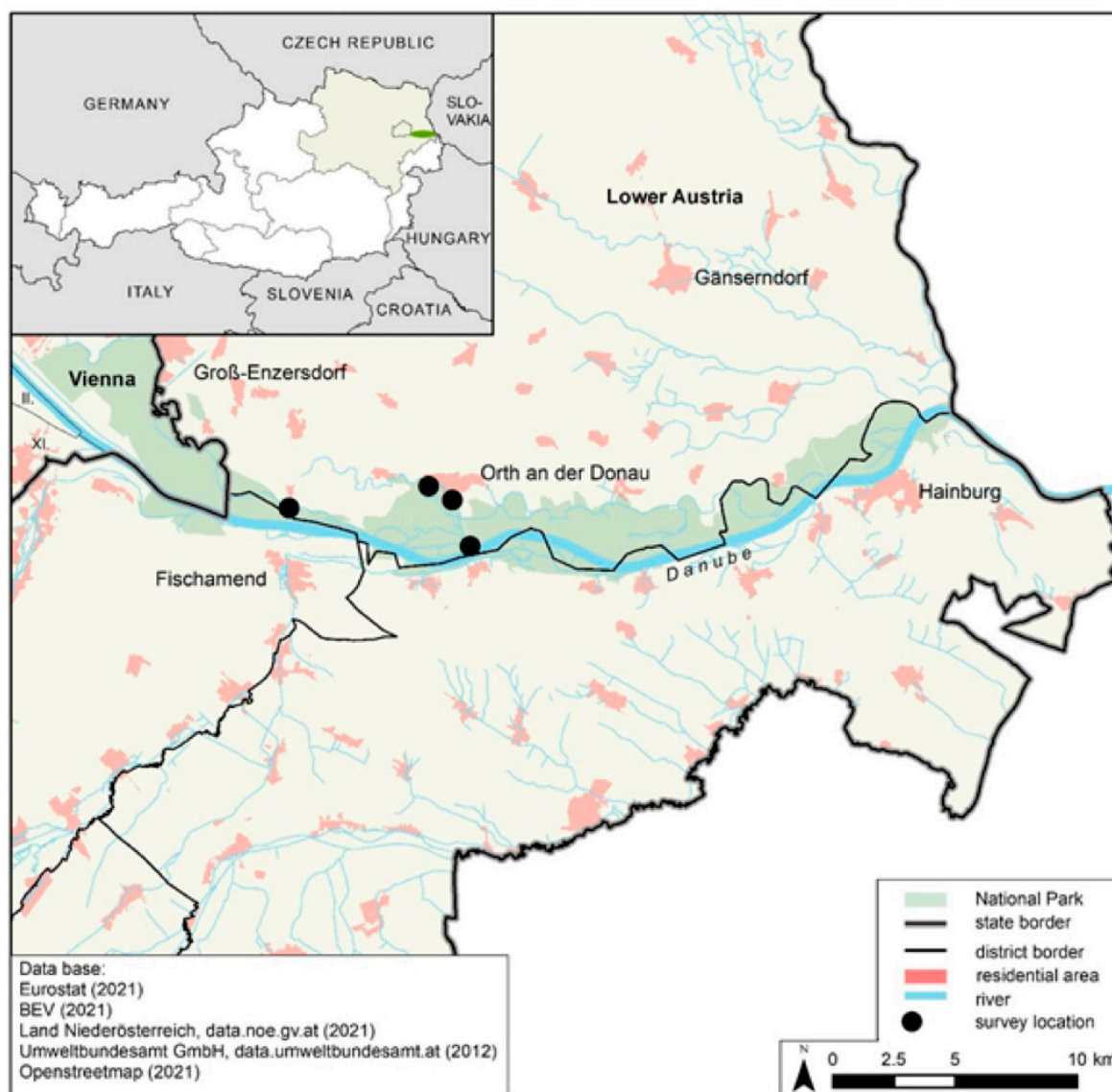


Figure 1. Location of the Danube Floodplains National Park in East Austria.

Dams and some river power plants along the Danube limit the river dynamics. Ongoing revitalization measures such as the reconnection of oxbow lakes to the mainstream and removal of the hard bank protection lead to stronger hydrological dynamics. The cultivation of forest monocultures in the floodplain has been discontinued, and most areas formerly used for agriculture have been left to succession or converted into floodplain meadows [41]. As a result, the landscape of the floodplain is gradually changing. Natural habitats are increasingly replacing anthropogenically influenced ones. However, the wetlands of the park are still subjected to limited hydrological dynamics, leading to floodplain areas with stagnant waters or silted-up oxbow lakes. Nevertheless, a high diversity of habitats, plant and animal species exists [38,41–43].

2.2. Questionnaire

The standardized questionnaire used for the survey covered the following topics: sociodemographic data (place of residence, age, gender), visit-related data (means of

arrival, duration of stay, frequency of visits), attitudes of visitors to national parks in general and to the DANP in particular, and landscape perceptions of the DANP.

The visitors' attitude towards national parks was assessed by means of agreement or disagreement with 13 given statements describing the functions and benefits of national parks in general and of the Danube Floodplain National Park in particular (e.g., "A NP protects rare animal and plant species and their habitats.", "A national park enables a high quality of recreation"). A 5-point answer scale ranging from "totally agree" to "totally disagree" was used. Another question asked visitors whether the proportion of national park areas where nature is not influenced by humans is to remain the same, is to be increased or reduced.

An adaption of the national-park affinity concept [10–14,20,21] was used. The affinity-based segmentation relies on the combination of three consecutive questions addressing the role of the national park brand for visitor trip motivation and identifies three segments among visitors. First, the survey queried visitors to understand if they were aware they were visiting a national park (brand awareness). Visitors were then asked "How important was the national park brand in your decision to come to this area?" The answering scale included four choices: the national park brand played (1) the dominant role; (2) an important role; (3) a less important role; and (4) no role in coming to this place. This question was followed by "Would you be here if the DANP is not a national park?" The possible response categories were "Yes" or "No.". The questions were cross-tabulated to identify the proportion of visitors who were specifically attracted by the national park brand (Table 1). This approach results in three groups: the so-called "Explicit National Park Visitor" (Explicit NP Visitor) is the segment with the highest national park affinity and who is only visiting the area because of the national park brand; the "Interested National Park Visitor" (Interested NP Visitor), for whom the national park brand has played an important role in visiting the area, has the second-highest affinity level; the "Area Visitor", whose visit is not influenced by the national park brand, has the lowest affinity level.

Table 1. Definition of national-park affinity segments with segment sizes (n = 426).

Would You Be Here if the Danube Floodplains Would not Be a NP?	The NP ^a Brand Played ...	The NP Brand Played ...			
		The Dominant Role (13.0%) ...	A Very Important Role (28.8%) ...	Not an Important Role (21.0%) ...	No Role (37.3%) in Coming to This Place
No (11.2%)		The Explicit NP Visitor: 8.2% (n = 35)		The Area Visitor: 60.8% (n = 259) *	
Yes (88.8%)		The Interested NP Visitor: 31.0% (n = 132)			

Notes: ^a NP: National Park. * Including respondents being not aware of visiting a national park.

One of the main objectives of the survey was to assess how visitors perceive the DANP and whether they see the Danube Floodplains as a national park at all. This complex of topics was addressed in the questionnaire on several levels. In order to find out how the visitors imagine a typical river landscape national park such as the Danube floodplains, they were presented with nine photos from the national park depicting typical natural and cultural river landscapes of the DANP. The following landscape types were selected for this purpose: Forest, Open Land, and Waters (Figure 2, pictures (a)(i)). Within the categories, three pictures each were shown, representing a gradient according to the degree of river dynamics and humans influence (forest: natural softwood forest stand—natural hardwood forest stand—managed monoculture forest stand, consisting of hybrid poplar trees, pictures (a)–(c); open land: wet meadow—meadow—arable monoculture, pictures (d)–(f); water bodies: side arm with high hydrological dynamics, side arm with dead wood and limited hydrological dynamics, almost stagnant water body with low hydrological dynamics, pictures (g)–(i)). Pictures (c)–(f) represent anthropogenically created (cultural) landscapes. Visitors were asked "Does this landscape photo characterize for you a typical river national park" with the answer categories "Yes" or "No".

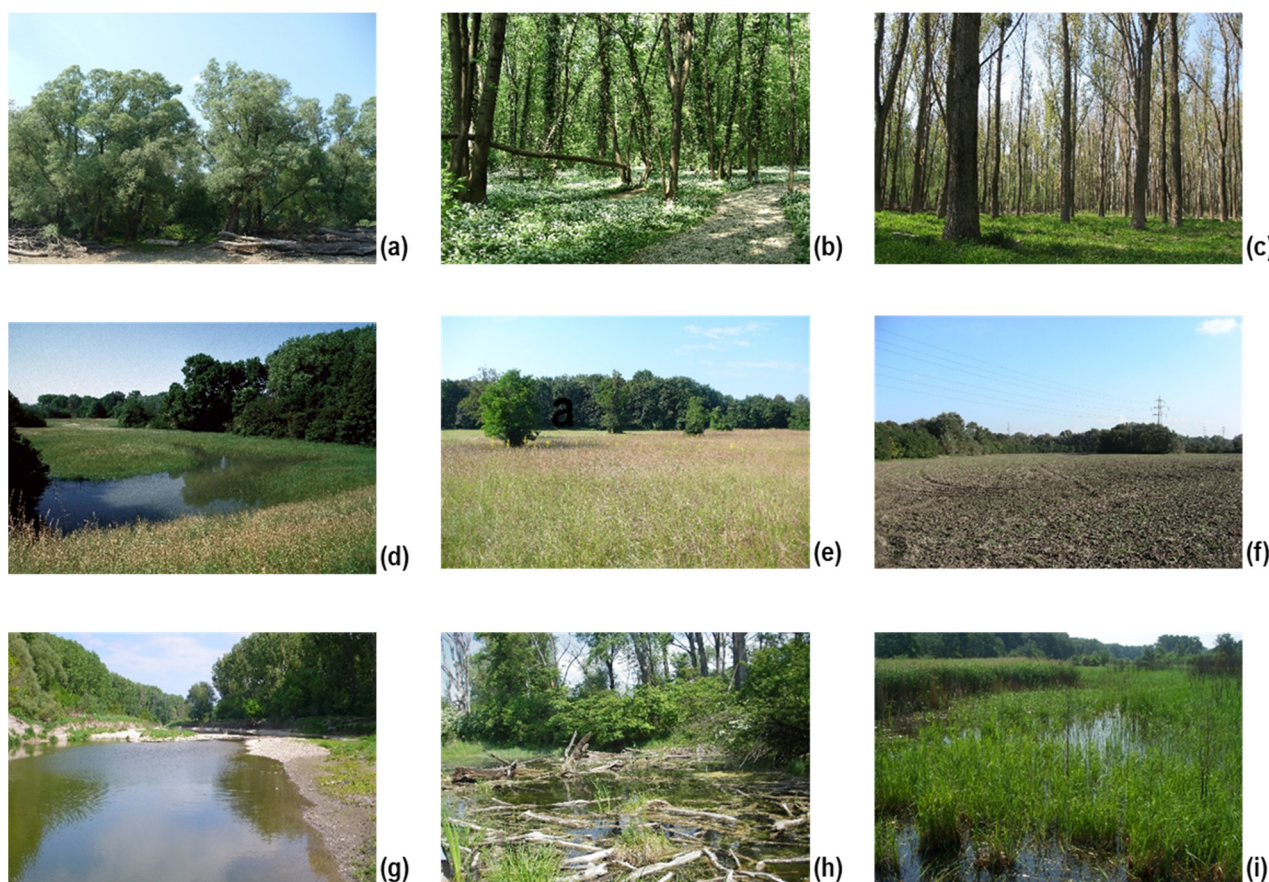


Figure 2. Presented landscape types from the Danube Floodplains National Park (pictures (a–i)).

Four questions addressed visitor perceptions of the DANP: One question asked them “Does your visit experience in the Danube floodplains match the experience you would expect for a typical river national park?” using a 7-point answer scale ranging from “Yes, totally agree” to “No, totally disagree”; another question asked them: “Do you have the feeling of being in a national park when you visit the Danube floodplains?” using a 7-point answer scale ranging from “I have the very strong feeling of being in a national park” to “I do not at all have the feeling of being in a national park”. Respondents who have been visiting the DANP for at least 5 years ($n = 292$) were additionally asked whether the landscape in the Danube floodplains has changed in recent years and if they felt that the park is increasingly turning into a national park not influenced by humans. The respective 7-point answer scales ranged from “Not changed” to “Strongly changed” and “Yes, very strong” to “No, not at all”.

2.3. Data Collection

Data were collected on nine, randomly selected, days to reflect the area’s visit patterns and capture a diverse visitor segment, including local residents, day tourists and international tourists. On-site face-to-face interviews with 431 visitors took place at four important access points around the village of Orth on three workdays, two Saturdays and four Sundays throughout the day during the warmer period (August to October). Five visitors provided incomplete data on national park affinity and were removed, resulting in a final sample size of $n = 426$; the sample size is within a sampling error of less than 5%. The response rate was 44%; predominantly bicyclists refused to take part in the interviews (the response rate of bicyclists was 28% only). No incentives were offered to respondents. Interviews took about 15–20 min.

2.4. Data Analysis

Data analysis was undertaken in the statistical software IBM SPSS 25. Chi²-tests, non-parametric (Median-test) and parametric tests (ANOVA) including post-hoc tests were used to test for differences between affinity segments. Spearman correlation was used to assess relationships between national park perceptions and evaluation of river landscape images. A significance level of $p < 0.05$ was chosen.

3. Results

3.1. Profile of Respondents

The average age of respondents was 50.8 years. The proportion of male respondents was slightly higher than that of women. The proportion of respondents with a university degree was close to 30%. Half of the respondents were employed. The proportion of retired persons was about one-third. Almost all respondents (96%) have their place of residence in Austria. Of these, slightly more than half live in Vienna and around 41% in Lower Austria. International visitors came mainly from Germany and Slovakia. About 5% were overnight guests. A large part of the respondents used a car (66%) to travel to the DANP. Approximately one-fifth came by bike or mountain bike and just under one-tenth on foot. The proportion of people who used public transport was at 2%. About three-quarters of the interviewees were walkers, followed by cyclists, who accounted for slightly more than one-fifth. The remaining respondents were Nordic walkers and joggers. Approximately 15% of all groups surveyed had children under the age of 12 with them. One-fifth of the visitors were walking with one or more dogs. Interviewees spent an average of 2.7 h in the DANP on the day of the survey.

3.2. Characteristics of National Park Affinity Segments

The majority of the interviewees knew that they were in a protected area and correctly named it “Donau-Auen National Park”. For more than 40% of the respondents, the national park brand played a very important or even dominant role in their decision to visit the area (Table 1). Close to 90% of the respondents would have visited the Danube Floodplains even if they were not a national park. Only about 11% said they would not be here today if the area was not designated as a national park.

Based on the above questions, it was possible to identify the proportion of visitors who have a strong connection to the national park brand (Table 1). Accordingly, about 8% seemed to have come to the Danube Floodplains because of the national park brand. This segment was referred to as “Exclusive NP Visitors”. For another 31%, the national park played an important role, but they would have visited the floodplains even without the national park brand. This segment was named “Interested NP Visitors.” The so-called “Area Visitors” represented the largest share with almost 61%. For them, the national park brand was not or hardly a reason for the decision to visit the DANP. This group also includes those who were not aware of the national park's status.

The identified visitor segments differ in several respects: The segment “Exclusive NP Visitors” included the highest proportion of international and first-time visitors. Accordingly, the average frequency of visits in the last 365 days was low, but in return, significantly more time was spent in the DANP compared to the other segments (Table 2). The segment of “Interested NP visitors” had a low proportion of first-time visitors and a high proportion of retired people. Many visitors were from Vienna. With more than 70 visits per year, the “Area Visitors” were frequent visitors to the DANP, but they stay in the area for the shortest time. This segment had a high proportion of the local population and a high proportion of dog walkers. No differences in gender and age between segments were found.

Table 2. Profile of visitor segments with regard to national park affinity (n = 417).

Items	Explicit NP Visitor (8.2%)	Interested NP Visitor (31.0%)	Area Visitor (60.8%)	ANOVA/ Chi ² -Test
Age (mean)	50.1	53.3	49.9	n.s.
Gender (females in %)	47.1	47.7	47.9	n.s.
Education (in %)				
No graduation	0.0	0.8	0.8	n.s.
Secondary school	5.7	13.0	11.4	
Apprenticeship	0.0	2.3	0.4	
Technical school	22.9	32.1	28.6	
A-level	34.3	26.0	28.6	
(Applied) University	37.1	26.0	30.2	
Occupation (in %)				
Employee/worker	60	47.1	52.9	0.026
Retired	25.7	41.7	25.5	
Selfemployed	5.7	10.5	9.7	
Others	8.6	6.1	12	
Origin (in %)				
Community of Orth	0	10.8	14.1	0.002
District Groß-Enzersdorf	2.9	4.6	10.5	
Vienna, 22nd District	5.9	15.4	13.3	
Vienna	47.1	43.1	34.8	
Lower Austria	20.6	21.5	20.7	
Others	23.5	4.6	6.6	
Arrival mode (in %)				
Car/motorbike	80	69.2	63.3	n.s.
Bicycle	17.1	19.2	23.2	
On foot	0.0	9.2	12.2	
Public transport	2.9	2.3	1.6	
Activity type (in %)				
Hikers/Walkers	74.3	78.8	70.3	n.s.
Bicyclists	22.9	16.7	22.4	
Nordic Walkers	0.0	1.5	5.0	
Others	2.8	3	2.3	
Children in the group (yes in %)	8.8	12.2	17.4	n.s.
Dog walkers (yes in %)	11.8	16	24.9	0.049
Proportion first-time visitors (in %)	34.3	11.4	13.1	0.002
Length of stay (mean in hrs.)	3.8	2.8	2.6	0
Number of NPDA visits in the past year (mean)	19.3	53.3	73.2	0.056
Number of NP visits in the past 5 years excluding DANP visits (mean)	4.69	3.44	3.33	n.s.

3.3. National Park Perceptions

About two-thirds of the respondents agreed with the statement “to have the feeling of being in a national park when visiting the Danube floodplains”. Only 14% of the respondents did not have the feeling of being in a national park (Table 3; answer categories 6&7). “Area Visitors” had less of a sense of being in a national park than the other segments.

Table 3. National park affinity segments and national park perceptions (n = 421/292).

Items (Mean)	All	Explicit NP Visitor (8.2%)	Interested NP Visitor (31.0%)	Area Visitor (60.8%)	ANOVA/Median-Test
Do you have the feeling of being in a national park when you visit the Danube floodplains? ¹	3.13	2.53 ^a	2.65 ^a	3.46 ^b	0.001
Does your visit experience in the Danube floodplains match the experience you would expect for a typical river national park? ²	2.48	2.19 ^{a,b}	2.06 ^a	2.73 ^b	0.001
Has the landscape in the Danube floodplains changed in recent years? ³	3.39	3.11 ^{a,b}	3.10 ^a	3.57 ^b	0.037
Do you have the impression that the DANP is increasingly turning into a national park not influenced by humans? ⁴	3.82	3.06 ^a	3.82 ^a	3.90 ^a	n.s.

Notes: ¹ Answer scale ranging from 1 = I have the very strong feeling of being in a national park to 7 = I do not at all have the feeling of being in a national park. ² Answer scale ranging from 1 = Yes, I totally agree to 7 = No, I totally disagree. ³ Answer scale ranging from 1 = Not changed to 7 = Strongly changed. ⁴ Answer scale ranging from 1 = Yes, very strong to 7 = No, not at all. ^{a-b} Means with the same superscript do not differ at the $p < 0.05$ level.

Three-quarters of respondents indicated that their visit experience in the Danube Floodplain was consistent with the experience they would expect of a typical national park. Only a small percentage (7.4%, answer categories 6&7) felt that the visitor experience did not meet their expectations at all (Table 3). “Area Visitors” were less likely to feel that their visit experience in the Danube Floodplains was consistent with the experience they would expect from a typical national park; however, the differences were significant only between them and the “Interested NP Visitors”.

The majority of respondents who have been visiting the DANP for at least 5 years have not perceived changes in the landscape of the Danube floodplains (Table 3). “Area Visitors” perceived more changes compared to the other segments. The majority of respondents felt that the DANP is increasingly turning into a national park not influenced by humans. The more strongly respondents felt they were in a national park, the more closely their visit experience matched expectations ($r = 0.571$, $p < 0.001$). No differences between the segments were observed.

3.4. Attitudes towards National Parks

Almost all the respondents see national parks in general and the DANP in particular as useful nature conservation facilities (Table 4). Between 80% and 90% of the respondents (Answer categories 1&2) agreed that the quality of life in a region is increased by a national park, that nature conservation should have priority over all other uses and that restrictions on recreational use in a national park are acceptable for nature conservation reasons. Furthermore, an equal number of respondents thought that a national park enables a high quality of recreation or offers a unique experience of nature and has the task of providing environmental education opportunities. The agreement to the statements “a national park has positive effects on the economic development of a region” and “the interests of the local population are sufficiently taken into account in the nature conservation measures implemented in the DANP” was lower.

Differences between affinity segments emerged for most items (Table 4). The items “A NP has a positive impact on the economic development of the region”, “A NP allows me to experience nature in a unique way” and “The nature conservation measures set in the DANP sufficiently take into account the interests of the local population” did not differ. For most items, the agreement was lower among “Area Visitors”. No differences were found between the “Explicit NP Visitors” and the “Interested NP Visitors”. For most items, “Interested NP Visitors” differed from “Area Visitors”. The few differences between “Explicit NP Visitors” and “Area Visitors” could also be due to the small sample size of the “Explicit NP Visitors”.

Table 4. Visitor segments' attitudes towards NP and DANP (n = 423).

Items (Mean)	All	Explicit NP Visitor (8.2%)	Interested NP Visitor (31.0%)	Area Visitor (60.8%)	Median-Test
General NP items:					
A NP protects rare animal and plant species and their habitats.	1.13	1.06 ^{a,b}	1.08 ^a	1.17 ^b	0.004
I think NPs in general are useful.	1.17	1.06 ^a	1.10 ^a	1.21 ^a	0.012
A NP has the task of preserving or providing a natural landscape that is as pristine as possible.	1.24	1.17 ^{a,b}	1.14 ^a	1.30 ^b	0.002
A NP enhances the quality of life in the region.	1.46	1.26 ^{a,b}	1.34 ^a	1.56 ^b	0.027
A NP enables a high quality of recreation.	1.49	1.46 ^{a,b}	1.33 ^a	1.58 ^b	0.003
A NP allows me to experience nature in a unique way.	1.56	1.40	1.45	1.63	n.s.
A NP's mission is to provide environmental education opportunities.	1.70	1.57 ^{a,b}	1.60 ^a	1.76 ^b	0.035
A NP has a positive impact on the economic development of the region. ^x	2.30	2.09 ^a	2.25 ^a	2.35 ^a	n.s.
Questions specific to the DANP:					
I think the DANP is useful.	1.23	1.18 ^{a,b}	1.09 ^a	1.31 ^b	0.007
The DANP has the task of protecting one of the last free-flowing sections of the Danube. ^x	1.31	1.09 ^a	1.22 ^a	1.39 ^{a,b}	0.002
In the DANP, nature conservation should take precedence over all other uses.	1.50	1.20 ^a	1.34 ^a	1.61 ^b	0.002
In the DANP, restrictions on recreational use are acceptable for conservation reasons.	1.54	1.20 ^a	1.42 ^a	1.65 ^b	0.001
The nature conservation measures set in the DANP sufficiently take into account the interests of the local population. ^x	2.29	2.10 ^a	2.05 ^a	2.42 ^a	n.s.

Notes: Answer scale: 1 = totally agree to 5 = totally disagree; n.s. = not significant; ^x missing cases: cannot answer; DANP = Danube Floodplains National Park. ^{a,b} Post-hoc-tests: means with the same superscript do not differ at the $p < 0.05$ level.

Almost half of the respondents would like the proportion of national park areas where nature is not influenced by humans to remain the same, while slightly fewer were in favor of increasing these areas. In contrast, only very few were in favor of a reduction (Table 5). "Explicit NP Visitors" were significantly more supportive of increasing the amount of national parkland untouched by humans than the other two segments.

Table 5. Attitudes of visitor segments toward changes in natural areas of the DANP (n = 408).

The Proportion of Areas in the DANP That Are Not Influenced by Humans Is to ... (In %)	All	Explicit NP Visitor (8.2%)	Interested NP Visitor (31.0%)	Area Visitor (60.8%)	Chi ² -Test
remain unchanged	49.8	26.5	52.0	51.8	0.026
be increased	46.8	70.6	46.5	43.7	
be reduced	3.4	2.9	1.6	4.5	

3.5. River Landscapes Assignment

Apart from the "managed floodplain forest (picture (c))", the "meadow (picture (e))" and the "arable monoculture (picture (f))", all pictures were perceived by a clear majority of respondents as typical landscapes for a river national park (Table 6). While the agreement and disagreement with the image of the meadow (picture (e)) were more or less balanced, the arable monoculture (picture (f)) was rated as atypical for a river national park by 90%

of all respondents. No differences between affinity segments emerged for the assignment of the natural and cultural river landscapes.

Table 6. Assessments of DANP landscapes (Figure 2(a)–(i)) by respondents (n = 426).

Typical Landscapes for a River National Park (Yes In %)	All	Explicit NP Visitor (8.2%)	Interested NP Visitor (31.0%)	Area Visitor (60.8%)	Chi ² -Test
Natural softwood forest stand	89.2	88.2	86.6	90.7	n.s.
Natural hardwood forest stand	68.0	72.7	68.5	67.2	n.s.
Managed forest stand	27.9	42.4	27.6	26.2	n.s.
Wet meadow	86.3	90.9	81.1	88.3	n.s.
Meadow	45.2	42.4	46.4	44.9	n.s.
Arable monoculture	10.2	12.1	10.4	9.8	n.s.
Sidearm with high hydrological dynamic	95.7	97.1	96.8	94.9	n.s.
Sidearm with dead wood	95.9	94.1	95.3	96.5	n.s.
Stagnant water body	88.2	85.3	83.6	91.0	n.s.

Note: n.s. = not significant.

The more likely respondents felt the DANP is increasingly turning into a national park not influenced by humans ($r = -0.131$, $p = 0.027$) and the more likely their expected visit experience occurred ($r = -0.232$, $p < 0.001$), the more likely they were to rate the forest monoculture (picture (c)) as not typical of a river NP. For all other landscape images, there were no correlations between national park feeling, visit experience, perceived change in the DANP, and turn into a national park not influenced by humans.

4. Discussion

This study defined visitor segments based on the importance of the national park brand in decision making on visiting a suburban river national park. The study explored whether national park affinity explains differences in visitor attitudes towards national park functions, national park perceptions and understanding of river landscapes. Results show that park affinity segments differ in attitudes towards national park functions, had partly different DANP perceptions but did not differ in their assignment of typical landscapes of a river national park.

4.1. National Park Affinity Segments

Several authors claim that so far there has been few kinds of research into tourists' travel motivations and national park affinity to national parks [14,21,44]. This research found the national park brand attracted more than 40% of visitors surveyed (Explicit and Interested NP Visitors). This proportion is in line when compared to studies on Central European national parks using the same or similar approaches [10–13,21] but is lower compared to ex-European national parks [14,19]. However, we note that comparability is limited due to differences in the questions asked in the individual studies. As mentioned earlier, several European national parks are located near larger settlements or are long-established tourist areas, resulting in many local but few overnight visitors and tourists with little national park affinity [10,12,21]. Due to the suburban location of the DANP, the proportion of visitors from Vienna and the neighboring region was very high.

The results of the present study show, compared to a study conducted in 2000 in the DANP [45], a slight increase from 37% to 41% of “Explicit NP Visitors” and “Interested NP Visitors” for the Orth area. However, not all survey sites were completely identical and the sample size of the survey in 2000 was significantly smaller.

The share of “Explicit NP Visitors” of 8% also corresponds to the shares found in Central European national parks [12,45], but is significantly smaller than that of the Thai

Khao Yai National Park with 22% [14]. However, a recent study among overnight visitors to the Bavarian Forest National Park found an “Explicit NP Visitors” proportion of 24% [21]. This may also be due to the fact that international and national recognition of Germany’s oldest national park is quite high.

The affinity segments differ in many aspects. The “Area Visitors” was the group that had the highest level of experience with the DANP and engaged in typical short-term everyday leisure activities close to home, such as dog walking [39]. This contrasts with the “Explicit NP Visitors”. Among this segment, first-time visitors are very high. Many come from outside the provinces of Lower Austria and Vienna, and virtually no respondent is from the immediate vicinity of the national park. Thus, the national park brand attracts day and overnight tourists from further away and this can lead to a strengthening of the regional tourism economy.

4.2. Attitudes towards National Parks

Public attitudes towards national parks play an important role in the success of protected areas in terms of environmental education, biodiversity conservation, people’s wellbeing and as a tourism destination [26–35]. The attitudes of the DANP visitors towards national parks are mostly positive. Almost all respondents rated national parks in general and the DANP in particular as useful nature conservation facilities. In line with previous studies, agreement was lower when it comes to positive regional-economic functions of the national park [12,21]. The very low proportion of international and overnight guests in this survey may support their perceptions of the limited regional-economic functions of national parks.

Previous research [12,13,21] has shown that visitors with higher national park affinity have more positive attitudes towards nature conservation management and park functions. Their greater understanding of the nature conservation goals of national parks eases visitor communication and management because of a higher understanding and acceptance of national park regulations and nature conservation measures [14,21]. This study also found that respondents with higher affinity had more positive attitudes toward national park functions. The high proportion of “Area Visitors” could pose a challenge to DANP management should attitudes toward the goals and functions of a national park not be accepted. However, the mean values indicate that this segment also has a positive attitude towards the park functions.

The positive attitude of the respondents towards national parks and the DANP is also evident in terms of their attitudes towards the proportion of land in the DANP which is not to be affected by human activity. Almost none of the respondents would like to reduce this proportion. However, more “Explicit NP Visitors” were in favor of increasing this proportion.

4.3. Perceptions of the DANP

This study focused also on the coherence of the national park experience. Most DANP visitors had the feeling of being in a national park when visiting the Danube floodplains and their on-site experience was in line with the experience they would expect from a typical national park. In addition, the majority of the respondents felt that the Danube floodplains are more and more turning into a national park. All these results indicate that even the “Explicit NP Visitors” have a coherent national park feeling, although there exist still some cultural landscapes in the DANP and the river dynamics are only fully given in some parts. However, the mean scores also indicate that it was not an ideal-typical national park experience for the respondents. The “Area Visitors” were less convinced that they were in a national park, perhaps because they are less aware of the national park functions, or for a larger proportion among them who live near the national park the DANP is part of their usual living environment and may therefore nothing special [39].

4.4. River Landscapes Assessment

This study focused also on the understanding of natural river landscapes from the perspective of DANP visitors. Overall, those images from the DANP that depicted natural landscapes were judged to be typical of a river landscape national park. Although the affinity segments differed with regard to the attitudes towards and perceptions of a national park or the DANP, and also with regard to the area that should be made available to nature, no difference could be found in the evaluation of the river landscape images. Even though a large part of the respondents correctly assigned landscapes that are typical for a river national park, a not insignificant part evaluated landscapes that indicated a lack of river dynamics or cultural landscapes as typical for a river national park. About 10% even rated extensive cropland, 28% managed forest, 55% meadows, and 86% wet meadows as typical of a riverine national park, while for one-third of the respondents, hardwood forests were not typical for a national park, although these represent a natural habitat of a river floodplain. “Area Visitors” have high area knowledge. They may be accustomed to landscapes with low river dynamics and cultural landscapes such as meadows. That “Explicit NP Visitors” did not correctly assign some landscapes may also be based on their lack of knowledge of these natural riverine landscapes. They also did not seem to have more experience with other national parks, as they had not visited more national parks in the last 5 years than the other segments. Arnberger et al. [21] also found that the affinity segments of the Bavarian Forest National Park did not differ in the number of national parks visited.

5. Conclusions

For sustainable national park management and educational program development, it is essential to know the visitors’ attitudes towards the national park and how the protected area is perceived [26,28,33,46]. This study found that for 60% of the respondents, the national park brand played almost no role in a visit to the DANP. In principle, the attitudes towards nature conservation, national parks and the DANP are quite positive, but respondents with higher affinity showed even more positive attitudes towards national parks and DANP. Most respondents had the feeling of being in a national park, but again, it appeared that those respondents with higher national park affinity had increased this feeling. Surprisingly, however, the classification of the river landscapes was the same across the segments. Apparently, there is uncertainty among many visitors across all segments as to what is a natural and what is a cultural river landscape. The meadows were considered a typical river national park landscape by a very large number of respondents, even though they were anthropogenically created. A lack of knowledge of the riverine ecosystem was evident in all segments, although attitudes toward national parks and conservation differed among segments.

Meadows in combination with floodplain forests were rated as the most preferred landscape section by visitors in a landscape preference study in the Viennese part of the DANP [5]. Meadows have been part of the DANP landscape for centuries, and long-term visitors may be accustomed to seeing them in the DANP. From this perspective, while meadows are typical, attractive, and biodiverse landscapes of the DANP [5,41], they are not typical natural landscapes of a riverine national park. Especially national parks, which have been under human influence for a long time, are often still characterized by cultural landscapes at the beginning of their establishment. Here, visitors can have a wrong impression and understanding of natural landscapes. An important task of river national parks and the DANP will therefore be environmental education and interpretation, to make visitors of all segments aware of the untouched and to communicate with the river ecosystem and its landscapes. People should be informed about the historical spread of floodplains and pristine river dynamics, and that the severely restricted river dynamics since 1870 have resulted in standing and silting oxbow lakes and a loss of floodplain-typical habitats [41]. People should be able to identify floodplain-typical, natural sites such as softwood forest stands in the national park landscape and they should be able to distinguish

between typical and atypical floodplain landscapes. This can be achieved, for example, through theme trails, information boards about the historic and current river ecosystem, guided tours, educational offers for children and other information materials, including social media.

Suburban national parks, which are heavily visited not only by local visitors but also by national and few international visitors, face visitor groups that may have different affinities and attitudes toward a national park. In particular, the “Area Visitors” are less supportive of national parks [12,14,21]. National park management should therefore consider that neither cultures nor visitor groups are homogeneous, and each group has different needs for information delivery and different views on nature [47].

Limitations of this study refer to the landscape images shown. Images always represent only a section of a landscape but are often used as surrogates of reality in social research on landscape aesthetics [48]. The survey focused on park access points around the visitor center in Lower Austria, but future surveys should include the entire national park. Questions about the understanding of a river national park, national park affinity and attitudes should be collected regularly to be able to determine trends and to evaluate the effects of environmental education programs.

Author Contributions: Conceptualization, A.A. and R.E.; methodology, A.A. and R.E.; software, A.A.; formal analysis, A.A. and H.P.; investigation, A.A., R.E. and H.P.; data curation, A.A.; writing—original draft preparation, A.A.; writing—review and editing, A.A., R.E. and H.P.; visualization, H.P.; project administration, A.A. and R.E.; funding acquisition, A.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Donau-Auen Nationalpark GmbH, Lower Austria.

Institutional Review Board Statement: All subjects in the study were anonymously labeled and agreed to participate in the study.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. The study was conducted in accordance with the Declaration of Helsinki.

Data Availability Statement: Restrictions apply to the availability of these data.

Acknowledgments: We thank Martin Ebenberger and the interviewers.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

References

1. Dudley, N. (Ed.) *Guidelines for Applying Protected Area Management Categories*; IUCN: Gland, Switzerland, 2008.
2. Tockner, K.; Stanford, J.A. Riverine flood plains: Present state and future trends. *Environ Conserv* **2002**, *29*, 308–330. [\[CrossRef\]](#)
3. Hornung, L.K.; Podschun, S.A.; Pusch, M. Linking ecosystem services and measures in river and floodplain management. *Ecosys. People* **2019**, *15*, 214–231. [\[CrossRef\]](#)
4. Eagles, P.F.J.; McCool, S.F. *Tourism in National Parks and Protected Areas: Planning and Management*; CABI Publishing: Wallingford, UK, 2002.
5. Arnberger, A.; Eder, R.; Preiner, S.; Hein, T.; Nopp-Mayr, U. Landscape preferences of visitors to the Danube Floodplains National Park, Vienna. *Water-SUI* **2021**, *13*, 2178. [\[CrossRef\]](#)
6. Junker, B.; Buchecker, M. Aesthetic preferences versus ecological objectives in river restorations. *Landsc. Urban Plan* **2008**, *85*, 141–154. [\[CrossRef\]](#)
7. Stewart, W.; Larkin, K.; Orland, B.; Anderson, D. Boater preferences for beach characteristics downstream from Glen Canyon Dam, Arizona. *J. Environ. Manag.* **2003**, *69*, 201–211. [\[CrossRef\]](#)
8. Eder, R.; Arnberger, A. How heterogeneous are adolescents' preferences for natural and semi-natural riverscapes as recreational settings? *Landsc. Res.* **2016**, *41*, 555–568. [\[CrossRef\]](#)
9. Wall Reinius, S.; Fredman, P. Protected areas as attractions. *Ann. Tour. Res.* **2007**, *34*, 839–854. [\[CrossRef\]](#)
10. Mayer, M.; Müller, M.; Woltering, M.; Arnegger, J.; Job, H. The economic impact of tourism in six German national parks. *Landsc. Urban Plan* **2010**, *97*, 73–82. [\[CrossRef\]](#)
11. Küpfer, I. *Die Regionalwirtschaftliche Bedeutung des Nationalparktourismus: Untersucht am Beispiel des Schweizerischen Nationalparks*; Department of Geography University of Zurich: Zurich, Switzerland, 2000.

12. Arnberger, A.; Eder, R.; Allex, B.; Sterl, P.; Burns, R.C. Relationships between national-park affinity and attitudes towards protected area management of visitors to the Gesaeuse National Park, Austria. *For. Policy Econ.* **2012**, *19*, 48–55. [\[CrossRef\]](#)
13. Müller, M.; Job, H. Managing natural disturbance in protected areas: Tourists' attitudes towards the bark beetle in a German national park. *Biol. Conserv.* **2009**, *142*, 375–383. [\[CrossRef\]](#)
14. Seebunruang, J.; Burns, R.C.; Arnberger, A. Is national park affinity related to visitors' satisfaction with park service and recreation quality? *A case study from a Thai Forest National Park. Forests* **2022**, *13*, 753.
15. Iso-Ahola, S. Toward a social psychological theory of tourism motivation: A rejoinder. *Ann. Tour. Res.* **1982**, *9*, 256–262. [\[CrossRef\]](#)
16. Luo, Y.; Deng, J. The new environmental paradigm and nature-based tourism motivation. *J. Travel Res.* **2008**, *46*, 392–402. [\[CrossRef\]](#)
17. Park, D.B.; Yoon, Y.S. Segmentation by motivation in rural tourism: A Korean case study. *Tour. Manag.* **2009**, *30*, 99–108. [\[CrossRef\]](#)
18. Job, H. Estimating the regional economic impact of tourism to national parks: Two case studies from Germany. *GAIA Ecol Perspect. Sci. Soc.* **2008**, *17*, 134–142. [\[CrossRef\]](#)
19. Stynes, D.J. *Impacts of Visitor Spending on the Local Economy: Yellowstone National Park, 2005*; Report Prepared for National Park Service; Michigan State University: East Lansing, MI, USA, 2008.
20. Bayer, J.; Fehringer, A.; Lehar, G.; Jurgeit, F.; Leitner, T. The relevance of visitors' national park affinity for effective visitor management in protected areas. In *Visitor Management in Tourism Destinations*; Albrecht, J.N., Ed.; CABI Publishing: Wallingsford, UK, 2017; pp. 75–87.
21. Arnberger, A.; Eder, R.; Allex, B.; Preisel, H.; Husslein, M. National Park affinity segments of overnight tourists differ in satisfaction with, attitudes towards, and specialization in, national parks: Results from the Bavarian Forest National Park. *J. Nat. Conserv.* **2019**, *47*, 93–102. [\[CrossRef\]](#)
22. Chin, A.; Daniels, M.D.; Urban, M.A.; Piegay, H.; Gregory, K.J.; Bigler, W.; Butt, A.Z.; Grable, J.L.; Gregory, S.V.; Wohl, E.; et al. Perceptions of wood in rivers and challenges for stream restoration in the United States. *Environ. Manag.* **2008**, *41*, 893–903. [\[CrossRef\]](#)
23. Garcia, X.; Benages-Albert, M.; Buchecker, M.; Vall-Casas, P. River rehabilitation: Preference factors and public participation implications. *J. Environ. Plan Manag.* **2020**, *63*, 1528–1549. [\[CrossRef\]](#)
24. Vesterinen, J.; Pouta, E.; Huhtala, A.; Neuvonen, M. Impacts of changes in water quality on recreation behavior and benefits in Finland. *J. Environ. Manag.* **2010**, *91*, 984–994. [\[CrossRef\]](#)
25. Wilson, M.I.; Robertson, L.D.; Daly, M.; Walton, S.A. Effects of visual cues on assessment on water qualities. *J. Environ. Psychol.* **1995**, *15*, 53–63. [\[CrossRef\]](#)
26. Rentsch, G. *Die Akzeptanz eines Schutzgebietes: Untersucht am Beispiel der Einstellung der lokalen Bevölkerung zum Nationalpark Bayerischer Wald*; Münchener Geographische Hefte, Nr. 57; Verlag Michael Laßleben: Regensburg, Germany, 1988.
27. Stoll-Kleemann, S. Barriers to nature conservation in Germany: A model explaining opposition to protected areas. *J. Environ. Psychol.* **2001**, *21*, 369–385. [\[CrossRef\]](#)
28. von Ruschkowski, E. *Ursachen und Lösungsansätze für Akzeptanzprobleme von Großschutzgebieten am Beispiel von zwei Fallstudien im Nationalpark Harz und im Yosemite National Park*; Ibidem-Verlag: Hannover/Stuttgart, 2010.
29. Arnberger, A.; Schoissengeier, R. The other side of the border: Austrian local residents' attitudes towards the neighbouring Czech Sumava National Park. *J. Nat. Conserv.* **2012**, *20*, 135–143. [\[CrossRef\]](#)
30. Walpole, M.J.; Goodwin, H.J. Local attitudes towards conservation and tourism around Komodo National Park, Indonesia. *Environ. Conserv.* **2001**, *28*, 160–166. [\[CrossRef\]](#)
31. Cihar, M.; Stankova, J. Attitudes of stakeholders towards the Podyji/Thaya River Basin National Park in the Czech Republic. *J. Environ. Manag.* **2006**, *81*, 273–285. [\[CrossRef\]](#)
32. Machairas, I.; Hovardas, T. Determining visitors' dispositions towards the designation of a Greek national park. *Environ. Manag.* **2005**, *36*, 73–88. [\[CrossRef\]](#)
33. Huber, M.; Arnberger, A. Opponents, waverers or supporters: The influence of place-attachment dimensions on local residents' acceptance of a planned biosphere reserve in Austria. *J. Environ. Manag. Plan* **2016**, *59*, 1610–1628. [\[CrossRef\]](#)
34. McCleave, J.; Espiner, S.; Booth, K. The New Zealand people-park relationship: An explanatory model. *Soc. Nat. Res.* **2006**, *19*, 547–561. [\[CrossRef\]](#)
35. Job, H. Großschutzgebiete und ihre Akzeptanz bei Einheimischen. Das Beispiel der Nationalparke im Harz. *Geogr Rundschau* **1996**, *48*, 159–165.
36. Arnberger, A.; Eder, R.; Allex, B.; Preisel, H.; Ebenberger, M.; Husslein, M. Trade-offs between wind energy, recreational, and bark-beetle impacts on visual preferences of national park visitors. *Land Use Policy* **2018**, *76*, 166–177. [\[CrossRef\]](#)
37. Hein, T.; Blaschke, A.P.; Haidvogel, G.; Hohensinner, S.; Kucera-Hirzinger, V.; Preiner, S.; Reiter, K.; Schuh, B.; Weigelhofer, G.; Zsuffa, I. Optimised management strategies for the Biosphere reserve Lobau, Austria—based on a multi criteria decision support system. *Ecohydrol. Hydrobiol.* **2006**, *6*, 25–36. [\[CrossRef\]](#)
38. Nationalparks Austria. Available online: <https://www.nationalparksaustria.at/de/nationalpark-donau-auen.html> (accessed on 4 December 2022).
39. Arnberger, A. Recreation use of urban forests: An inter-area comparison. *Urban Urban Green* **2006**, *4*, 135–144. [\[CrossRef\]](#)
40. Arnberger, A.; Brandenburg, C. Past on-site experience, crowding perceptions, and use displacement of visitor groups to a peri-urban national park. *Environ. Manag.* **2007**, *40*, 34–45. [\[CrossRef\]](#)

41. Nationalpark Donau-Auen GmbH. *Managementplan 2019–2028*; Nationalpark Donau-Auen: Orth/Donau, Austria, 2019.
42. Preiner, S.; Bondar-Kunze, E.; Pitzl, B.; Weigelhofer, G.; Hein, T. Effect of hydrological connectivity on the phosphorus buffering capacity of an urban floodplain. *Front. Environ. Sci.* **2020**, *8*, 147. [[CrossRef](#)]
43. Baart, I.; Gschöpf, C.; Blaschke, A.P.; Preiner, S.; Hein, T. Prediction of potential macrophyte development in response to restoration measures in an urban riverine wetland. *Aquat. Bot.* **2010**, *93*, 153–162. [[CrossRef](#)]
44. Kruger, M.; Saayman, M. Travel motivation of tourists to Kruger and Tsitsikamma National Parks: A comparative study. *South Afr. J. Wildl. Res.* **2010**, *40*, 93–102. [[CrossRef](#)]
45. Arnberger, A.; Brandenburg, C. *Besuchermotivation im Nationalpark Donau-Auen, Niederösterreichischer Anteil. Report*; Institut für Freiraumgestaltung und Landschaftspflege, Universität für Bodenkultur Wien: Vienna, Austria, 2002.
46. Mose, I.; Weixlbaumer, N. A new paradigm for protected areas in Europe? In *Protected Areas and Regional Development in Europe: Towards a New Model for the 21st Century*; Mose, I., Ed.; Ashgate Publishing: Aldershot, UK, 2007; pp. 3–19.
47. Gao, J.; Zhang, C.; Huang, H.J. Chinese tourists' views of nature and natural landscape interpretation: A generational perspective. *J. Sust. Tour.* **2017**, *26*, 668–684. [[CrossRef](#)]
48. Daniel, T.C.; Meitner, M.M. Representational validity of landscape visualizations: The effects of graphical realism on perceived scenic beauty of forest vistas. *J. Environ. Psychol.* **2001**, *21*, 61–72. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.