Destination-specific analysis of tourist satisfaction and its determinants in major national parks of Japan

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Abbreviations: PA, protected area; PCA, principal component analysis

Abstract

Enhancing tourist satisfaction is the key to sustainable tourism in protected areas. However, tourist satisfaction may be influenced by various factors, including the specific destinations visited inside protected areas. Here, we conducted a destination-specific analysis of major national parks in Japan using an online questionnaire to examine the factors determining tourist satisfaction. Participants were asked questions regarding their gender and age, accessibility to the park, awareness about the national park, specific destinations visited within the park, and motivations for visiting. Responses from 1,175 participants were included in the final analysis. We found that tourist satisfaction generally increased with the distance from tourists' residential areas to destinations. Additionally, tourists who were aware that the destination was situated within a designated national park reported a higher level of satisfaction. Increasing the awareness regarding national parks and the associated knowledge input from visual, verbal, and sensory stimuli can thus increase tourist satisfaction and improve economic circulation in rural areas through increased tourism from outside the region. We also demonstrated that the effect of protection level on tourist satisfaction varies according to the destination group with different motivations for visiting. Our study underscores the importance of tailoring management strategies to address the unique requirements of different destinations within a park, thereby facilitating tourist satisfaction and experience.

Keywords

Ecotourism; Cultural ecosystem services; National park; Satisfaction; Online questionnaire survey; Recreation

Impact statement

Enhancing tourist satisfaction is crucial for sustainable tourism in protected areas. Our destination-specific analysis of major national parks in Japan revealed that satisfaction generally increases with the distance from tourist residential areas to destinations. Additionally, tourists who are aware of a destination's designation within a national park have higher satisfaction levels. By increasing the awareness of these parks and providing diverse knowledge inputs, such as visual, verbal, and sensory stimuli, we can bolster tourist satisfaction and stimulate economic growth in rural areas through increased tourism from beyond the region. Moreover, our findings highlight the nuanced impact of protection levels on satisfaction, contingent on the diverse motivations of destination groups. Thus, tailoring management strategies to cater to the distinct needs of various destinations within a park is critical for enhancing tourist satisfaction and overall experience.

1. Introduction

Ecotourism, defined as responsible travel to natural areas that conserves the environment while enhancing the well-being of local people, has emerged as a significant force in the tourism industry (Balmford et al., 2009). With the rising demand for nature-based experiences, tourism utilizing natural resources has considerably risen in recent years, fostering economic benefits such as employment and income in surrounding regions (Ardoin et al., 2015).

Protected areas (PAs) are central to the conservation of natural ecosystems and promotion of sustainable tourism. A PA is outlined as "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystems services and cultural values" (Dudley, 2008). PAs, which cover 15.4% of the Earth's land and inland water areas and 3.4% of the oceans (Juffe-Bignoli et al., 2014), serve to prevent deforestation and mitigate habitat loss and species decline. Moreover, they actively provide valuable recreational spaces for people wanting to engage with nature and offer a wide range of ecosystem services, including cultural ones.

Efforts to balance conservation imperatives with tourism utilization within PAs have led to the implementation of various management strategies, including visitor regulations and zoning schemes (Fennell, 2008; Pearce & Dowling, 2019; https://www.env.go.jp/park/about/protect/entry.html, 24/01/2024). However, challenges persist, such as the environmental impacts of excessive tourist visitations and funding resource constraints faced by PA management (Dodds & Butler, 2019; Hoffmann & Sven Schmeller, 2021). Addressing these challenges is essential to ensure the sustainable utilization of PAs for ecotourism purposes (World Tourism Organization, 2004).

Enhancing tourist satisfaction is the key to sustainable tourism within PAs (World Tourism Organization, 2004), reflecting the alignment between tourists' expectations and experiences (Oliver, 1980). High levels of satisfaction are associated with positive tourist behaviors, including loyalty to destinations and engagement in conservation efforts such as contributions to conservation funds, voluntary management, and environmentally responsible behaviors (Ramkissoon et al., 2013; Yoon & Uysal, 2005; Žabkar et al., 2010). Thus, understanding tourist satisfaction is critical to ensure support for PA conservation and management (Carvache-Franco et al., 2022; Chiu et al., 2014; Li et al., 2021)

Tourist satisfaction depends on several factors, including individual motivations for visiting a specific place and interacting with nature, demographic attributes, prior knowledge sources, accessibility, and naturalness of the destination area (Marasinghe et al., 2021; Oviedo-García et al., 2019; Río-Rama et al., 2022; Zhang et al., 2020). Oviedo-García et al. (2017) found that prior knowledge of tourists such as their experiences with the destination and other visual, verbal, and sensory stimuli (including advertisements, articles, and television programming) can affect satisfaction. Mutanga et al. (2017) demonstrated that different motivational factors influence satisfaction with wildlife tourism differently.

Most previous studies have used on-site or online structured questionnaires to explore the determinants of tourist satisfaction with their visit to entire PAs or their overall trips (Ibrahim et al., 2023; Otsuka et al., 2023; Romão et al., 2014). However, few studies have explicitly focused on specific tourist destinations within PAs and conducted a destination-level analysis to examine how tourist satisfaction varies according to their motivation for visiting, demographic attributes, prior knowledge sources, accessibility, and naturalness of destination areas. For example, "light" tourists who mainly visit common tourist spots and enjoy landscapes may be satisfied with well-managed infrastructure and facilities, whereas "core" tourists who mainly visit spots with high

naturalness and prefer activities that involve close interactions with nature such as mountain trekking may seek well-conserved pristine nature areas. Tourist motivations and associated satisfaction levels may thus vary depending on the destination within the PA. Therefore, conducting site-specific analyses is crucial to better understand visitors' demands and satisfaction.

In Japan, national parks serve as vital tourism assets, and there is a growing emphasis on enhancing tourist satisfaction within these areas. Recognizing the importance of national parks in the tourism sector, initiatives such as the "Project to Fully Enjoy National Parks" (https://www.env.go.jp/nature/mankitsu-project/, retrieved 01/02/2024) have been implemented. This project aims to protect highly pristine natural areas while enhancing visitor experiences, and efforts are focused on enhancing tourist satisfaction while raising awareness about tourism within the PAs of national parks.

In the present study, we conducted a destination-specific analysis of major national parks in Japan using an online questionnaire to identify the factors that determine tourist satisfaction. Specifically, we examined whether tourist satisfaction is associated with tourist attributes such as gender and age, accessibility to the park (physical distance from tourists' residential area to destination), awareness about the national park (whether the visitor knew the tourists spot was in the national park), specific destinations visited within the park (such as "Mt. Fuji," "Shiga Highland," or "Itsukushima-jinja Shrine"), motivations for visiting (e.g., "scenic enjoyment" or "mountain trekking"), and the protection level for each destination. By revealing the factors influencing tourist satisfaction, this study can potentially contribute to the enhancement of tourist satisfaction, ultimately promoting the sustainable utilization of PAs.

2. Study area

Three national parks in Japan, Fuji-Hakone-Izu National Park, Joshin'etsukogen National Park, and Setonaikai National Park, were selected as the survey locations (**Fig. 1**). The "Natural Park System" stands as the most influential element of Japan's nature conservation framework. Under this system, Natural Parks are designated and managed according to the Natural Parks Act, which focuses on outstanding natural landscapes that adequately represent Japan's scenery (Natural Parks Act, Chapter 1 Article 2, 1957).

Natural parks are categorized into three types based on the management system: "national parks," "quasi-national parks," and "prefectural nature parks." Among these, national parks are those that are administered by the Ministry of the Environment. Management and utilization of national parks adhere to the regulations outlined in the Natural Parks Act. The park management plan incorporates zoning, which divides the land into more strictly regulated "special zones" and less restrictive "ordinary zones." Special zones are areas with outstanding natural scenery that need to be maintained in their current states, while ordinary zones are areas outside the special zones. Both types of areas are accessible to tourists, and there are limited restrictions on existing human activities, such as residential and economic activities. However, the restrictions on developments differ between the two zones. Any modification within special zones requires prior permission for park authorities, while park authorities can just be notified for modifications in ordinary zones.

Additionally, special zones include subcategories such as "special protection zones" tailored to the level of conservation required. Zoning decisions are based on geographical, biological, and historical considerations. Currently, Japan has 34 designated national parks. The parks selected for the present survey are three of the top national parks in terms of total number of visitors in 2019 (https://www.env.go.jp/park/doc/data.html). These parks are popular destinations for both domestic and international tourists and attract diverse tourists. Moreover, they exhibit

distinct geographical features, including urban areas, mountainous regions, and coastlines, that provide a variety of tourist activities. These factors make them suitable choices for the destination-specific analysis of tourist satisfaction in this study.

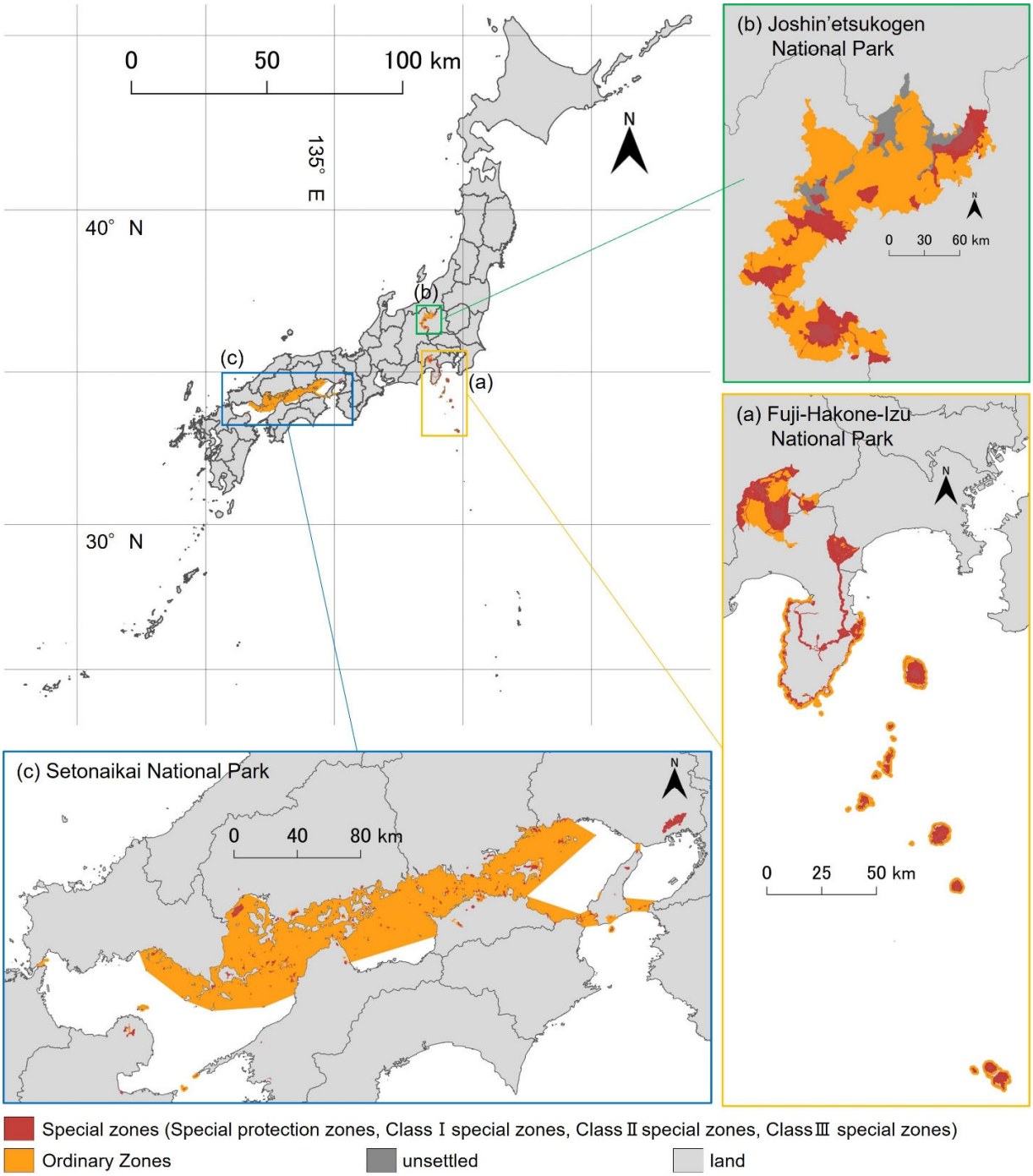

Fig. 1. Map showing the locations of (a) Fuji-Hakone-Izu National Park, (b) Joshin'etsukogen National Park, and (c) Setonaikai National Park in Japan.

2.1. Fuji-Hakone-Izu National Park

Fuji-Hakone-Izu National Park is known for its diverse features, including volcanoes, grasslands, and islands. It spans four prefectures near the Tokyo metropolitan area: Tokyo, Kanagawa, Shizuoka, and Yamanashi. In 2019, it recorded the highest annual number of visitors among Japan's national parks—132.5 million visitors. The park covers an area of 1,217.5 km^2 (land area only), with special protection zones constituting 6.3% of this area (https://www.env.go.jp/nature/mankitsu-project/). Designated as the 9th established national park in Japan in 1936, it is primarily divided into three regions: Fuji, Hakone, and Izu. The Fuji area, which includes the UNESCO World Cultural Heritage site Mount Fuji, is particularly popular as a tourist destination. In addition to Mount Fuji, this region offers other natural wonders, including Lake Yamanaka, Aokigahara Jukai Forest, and Asagiri Highland. The Hakone area is known for its hot springs and is centered around attractions formed by volcanic activity, such as the Owakudani Valley and Lake Ashi. The Izu area encompasses the Izu Peninsula and the Izu Islands. It boasts mountainous landscapes such as the Amagi Mountain Range and coastal attractions such as the Jougasaki Coast and Cape Irozaki. The Izu Islands offer opportunities for marine recreation, including diving. Among the Izu Islands, Hachijojima is the farthest from Tokyo, located approximately 290 km away.

2.2. Joshin'etsukogen National Park

Joshin'etsukogen National Park is located in the mountainous regions of Japan. It spans three prefectures of central Japan: Gunma, Niigata, and Nagano. In 2019, the total number of visitors was 23.7 million, making it the third most-visited national park in Japan. Covering an area of 1,481.9 km^2, the park is entirely land-based, with no marine area (https://www.env.go.jp/nature/mankitsu-project/). It was designated the 15th National Park in Japan in 1949. In 1980, a segment of the park was designated as one of Japan's first four UNESCO Biosphere Reserves. The park mainly comprises high mountainous zones, attracting numerous hikers every year. In winter, many tourists engage in skiing and snowboarding in areas such as Mount Naeba and the Shiga Highland. Additionally, this national park includes popular tourist destinations such as the hot spring town of Kusatsu Onsen and the summer retreat town of Karuizawa.

2.3. Setonaikai National Park

Setonaikai National Park is located in western Japan and primarily comprises coastline and islands. It spans 11 prefectures: Hyogo, Wakayama, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Fukuoka, Oita, and Osaka (only maritime areas). In 2019, it had the second-highest annual number of visitors, 44.5 million, among Japan's national parks. It covers an area of 673.1 km^2, but the designated area includes many maritime areas (https://www.env.go.jp/nature/mankitsu-project/). Established in 1934, this park was one of the first national parks in Japan. The region, centered around the Seto Inland Sea, features unique phenomena such as whirlpools (*uzushio*) and organisms such as the Indo-Pacific finless porpoise (*Neophocaena phocaenoides*). This park also includes the *Itsukushima-jinja* Shrine, a UNESCO World Heritage Site.

3. Methodology

3.1. Online questionnaire survey

We conducted an online survey to investigate past visits to tourist destinations, motivations for those visits, and levels of satisfaction (on a 5-point scale, see below). The survey was conducted using Rakuten Insight, a leading market research company in Japan, with a panel of 2.2 million individuals. The basic characteristics of the study participants, including household compositions and occupation, were not very different from the national indicators (https://insight.rakuten.co.jp/member/, 15/06/2024). We requested that the company reach out to registered individuals via email. The survey was conducted over three days from December 6 to 8, 2021. The target respondents comprised both men and women aged 15–99 years, who had visited at least one of the three national parks.

The questionnaire consisted of 6 questions in total (**Table 1**). In question 1, respondents were asked to select the national parks they had visited among the three, narrowing down the respondents to those who had visited at least one park. Remaining individuals, who did not select any park in Q1, were excluded from the survey. Before answering the questionnaire, we explicitly notified the respondents that "visit" in this questionnaire specifically refers to travelling with the purpose of tourism and not for residential or transit purposes. To avoid the confounding effects of COVID-19 on tourist satisfaction, we asked respondents to recall their visits before March 2020 (i.e., before the COVID-19 pandemic). Even if a person visits the same tourist destination multiple times, their motivations may change. To ensure consistency in responses regarding visiting time and motivations, respondents were instructed to answer based on their most recent visit.

In question 2, one of the national parks selected in Q1 was randomly specified, and the respondents were asked to answer questions about that park. To investigate the destinations and motivations for visiting, respondents were asked to select all the tourist destinations they visited from a list of 39 locations within the national park (**Fig. S1–S3; Table S1**). These locations were derived from a list provided by the website (https://www.env.go.jp/park/fujihakone/guide/view.html, 15/06/2024) of the Ministry of the Environment. If none of these options were applicable, the respondents were asked to answer free-text responses for destinations under "Others."

In question 3, respondents were asked to specify the motivation for visiting the chosen destinations by selecting one option from 17 items. If none of the options were applicable, they were asked to provide free-text responses for motivations under "Others." These choices for motivations for visiting were based on previous questionnaire surveys conducted by the Ministry of the Environment (2005) and Cabinet Office (2013).

In question 4, respondents rated how well their selected motivation from Q3 was fulfilled using a 5-point scale.

Finally, in question 5, to ascertain their place of residence, respondents were asked to provide their postal code.

244 **Table 1**. Contents of the online questionnaire.

Questions		Options
Q1	Please select the national park you have visited before March 2019 (i.e., before the COVID-19 pandemic). "Visit" in this questionnaire specifically refers to travelling for the purpose of tourism and not for residential or transit purposes. *This question is for screening. If you have selected any of the options, the survey will continue; otherwise, it will not proceed. *Along with the question, maps showing the boundaries of the national parks and the locations and names of tourist destinations are displayed. *Hereafter, respondents are asked to answer about one specified park randomly chosen from the selected parks in Q1.	"1. Fuji-Hakone-Izu National Park" "2. Joshin'etsukogen National Park" "3. Setonaikai National Park"
Q2	Please select all the tourist destinations you visited in your most recent visit to the national park. Additionally, did you know that the tourist destinations that you selected are within the designated area of the national park?	Tourist destination: 39 choices and/or free-text entry. e.g., "Mt. Fuji," "Itsukushima-jinja Shrine," and "Shiga Highland" Awareness of national park: "yes" or "no"
Q3	What was the motivation for your visit to the selected tourist destination? Please choose the most applicable option.	17 choices and/or free-text entry. "To enjoy the scenery" "To observe unique flora and fauna" "To visit shrines and temples" "To enjoy mountain trekking and hiking" "To enjoy camping" "To enjoy skiing and snowboarding" "To enjoy golfing" "To enjoy a drive and tour" "To enjoy swimming and diving" "To learn about flora and fauna" "To learn about local history" "To relax at a hot spring" "To enjoy meals prepared from local produce" "To enjoy fishing and gathering wild vegetables" "To get away from daily life" "To volunteer for cleaning and other activities" "To maintain physical health"

Q4	How satisfied were you with the selected motivation for your visit?	"5. Very satisfied" "4. Satisfied" "3. Neither" "2. Not satisfied" "1. Not satisfied at all"
Q5	Please provide your postal code.	Entry type

3.2. Data analysis

The data obtained from the survey underwent a thorough selection process before statistical analysis was conducted. Initially, the responses were scrutinized, and any data deemed inappropriate or insufficient were excluded. First, locations outside the designated national park boundaries were excluded when considering the free-text responses in Q2 regarding the tourist destinations visited. Similarly, responses indicating motivations such as commuting or attending school in free-text responses in Q3 were considered irrelevant to the survey's focus on "visit as a travel destination" and were thus excluded.

Free-text responses regarding visiting motivations were first assigned to the appropriate options among those provided. Answers that did not align with the pre-defined choices were categorized as "others." However, this "others" category was excluded from the subsequent analysis, as it included diverse motivations (e.g., "to meet friends" and "for annual events"). The decision to consolidate these responses into a single category labeled "others" and treat them equivalently to other visit motivations was deemed inappropriate.

All statistical analyses were conducted using the R software (version 4.1.2).

3.2.1. Grouping of tourist destinations based on visit motivations

First, tourist destinations within the national parks were grouped based on the reported visit motivations. The national parks included in this study vary significantly in their geographical features and encompass diverse tourist destinations, such as coastlines, mountains, and cultural heritage sites. Consequently, visit motivations are likely to differ depending on each tourist destination, and the factors contributing to satisfaction may also vary. Thus, we deemed it necessary to group destinations based on visit motivations to analyze the factors influencing satisfaction.

Principal component analysis (PCA) and cluster analysis were conducted to categorize the tourist destinations. To summarize the 17 visit motivations, PCA was performed using the proportions of reported visit motivations for each tourist destination. For instance, for "Mt. Fuji," if the number of respondents who visited was 329, and among them, 193 chose "to enjoy the scenery," the value for "to enjoy the scenery" at "Mt. Fuji" would be 193/329. From PCA, seven principal components with eigenvalues exceeding 1 were retained, contributing to a cumulative contribution rate of approximately 70%.

Using the loadings of the seven principal components obtained from PCA as variables, a distance matrix was calculated using Pearson's correlation coefficient with the "proxy" package in R. Cluster analysis was performed using the k-means function from the "stats" package, which is a nonhierarchical clustering method. The number of clusters was determined as three, which was confirmed as the appropriate number based on the silhouette index (an average silhouette index was over 0.7) obtained from the "NbClust" package in R (Tessema et al., 2022).

3.3.2. Exploring factors influencing tourist satisfaction

To identify the factors influencing tourist satisfaction, an ordinal logit regression model was used, which is a generalized linear model that predicts the probability of an outcome occurring based on several factors, particularly when the dependent variable is ordinal. The results are primarily interpreted from the odds ratios, which represent the change in the odds of an event occurring due to a one-unit change in a predictor variable. Komossa et al. (2020) also employed generalized linear models, including logistic regression, to evaluate tourism in PAs.

The dependent variable was tourist satisfaction, and the explanatory variables included five factors (**Table 2**). Satisfaction was assessed using a 5-point scale in response to Q4 (**Table 1**). The explanatory variables included gender (men/women), age, awareness of national parks (yes/no), distance from the respondent's residential area to the tourist destination, and level of protection (ordinary/special zones). Gender, awareness of national parks, and level of protection were converted into categorical variables, whereas age was treated as numerical data. Distance from the respondent's residential area to the tourist destination was calculated using the respondent's postal code and standardized to the straight-line distance between the centroid of the residential area defined by the postal code and the destination they visited. The package "Geosphere" in R was used for the calculations. In the model, we included the ID of each respondent and the identity of the national park where the tourist destination was included as random effects. The analysis was conducted using the package "ordinal" in R.

Table 2. Explanatory variables used in the ordinal logit regression analysis.

Variable name	Variable type	Description
Gender	Categorical (women/men)	Gender of the respondent
Age	Numerical (16–91)	Age of the respondent
Distance to tourist destination	Numerical	Straight line distance from the respondent's place of residence to the tourist destination.
Awareness of the national park	Categorical (yes/no)	Whether the respondent knew their destination(s) was in the national park.
Level of protection	Categorical (special zones/ ordinary zones)	Class of protection of the place where the tourist spot is located. (from "National Land Numeric Data," Ministry of Land and Infrastructure, 2015) *If there are several classes within one tourist spot, the class considered to have the largest area was used as the value.

4. Results

4.1. Respondents' characteristics

A total of 1,175 responses was obtained from respondents who had visited the national parks before the COVID-19 pandemic (i.e., before March 2020). Most of the respondents were "men" (70.4%), within "50–59 years" of the age (28.4%), and residing in the "Kanto" region (51.2%) (**Table 3**).

Table 3. Characteristics of the respondents from the online questionnaire.

Name of the national park		Fuji-Hakone-Izu		Joshin'etsukogen		Setonaikai		Total	
The number of respondents		384		387		404		1,175	
		n	%	n	%	n	%	n	%
Gender	Women	95	24.5	142	37.0	111	27.5	348	29.6
	Men	292	75.5	242	63.0	293	72.5	827	70.4
Age	10–19	0	0.0	0	0.0	1	0.2	1	0.1
	20–29	5	1.3	7	1.8	11	2.7	23	2.0
	30–39	27	7.0	43	11.2	26	6.4	96	8.2
	40–49	73	18.9	78	20.3	72	17.8	223	19.0
	50–59	94	24.3	116	30.2	124	30.7	334	28.4
	60–69	124	32.0	100	26.0	108	26.7	332	28.3
	70–79	54	14.0	37	9.6	58	14.4	149	12.7
	≥80	10	2.6	3	0.8	4	1.0	17	1.4
Region of residence	Hokkaido	7	1.8	7	1.8	9	2.2	23	2.0
	Tohoku	7	1.8	18	4.7	14	3.5	39	3.3
	Kanto	141	36.4	216	56.3	245	60.6	602	51.2
	Chubu	61	15.8	56	14.6	75	18.6	192	16.3
	Kansai	94	24.3	59	15.4	44	10.9	197	16.8
	Chugoku/Shikoku	43	11.1	11	2.9	4	1.0	58	4.9
	Kyushu/Okinawa	34	8.8	17	4.4	13	3.2	64	5.4

4.2. Tourist destination groups based on the motivation for visit

The most common motivation for visiting the national parks was "to enjoy the scenery" (**Fig. S4**). "To get away from daily life" was a characteristic motivation for visit to Fuji-Hakone-Izu National Park compared with the other two national parks. Meanwhile, for Setonaikai National Park, a notable motivation was "to visit shrines and temples." For Joshin'etsukogen Park, the distinct characteristic motivations included "to enjoy mountain trekking or hiking," "to enjoy skiing or snowboarding," and "to relax in hot springs." The geographic and cultural characteristics of each national park, such as mountains, shrines, and coastlines, were reflected in the motivations for visiting each park.

Through PCA (**Table S2**) and cluster analysis, 117 destinations were categorized into three groups based on the motivation for visit (**Fig. 2; Table 4**). In the first group ("landscape type"), the highest percentage of responses was for "to enjoy the scenery" (74.2%) while "to enjoy a drive or tour" was the second most common motivation (**Fig. S5**). The "mountain activity type"

group comprised destinations that included motivations for carrying out physical activities in mountainous areas such as "to enjoy mountain trekking or hiking" and "to enjoy skiing or snowboarding." The "diverse motivation type" group included destinations with motivations like "to relax in hot springs" and "to visit shrines and temples." There were no substantial differences in the respondent demographics among the groups (**Table S3**). Moreover, satisfaction levels did not significantly vary among the groups ($p > 0.05$, confirmed by Kruskal–Wallis test).

Fig. 2. Photographs of typical destinations for each tourist destination group.

Table 4. The three tourist destination groups based on the motivations for visit to each destination.

Landscape type (34 destinations in total across the three parks)		
Fuji-Hakone-Izu: 15 destinations	**Setonaikai: 8 destinations**	**Joshin'etsukogen: 11 destinations**
Lake Ashinoko	Shiraito Falls	Mt. Washu
Owakudani Valley	Onioshidashi Park	Cape Kannon
Shiraito-no-taki Falls	Usui Pass	Suo-Oshima Island
Sengokuhara	Usui third Bridge	Zenigata Sand Coin
Lake Shoji	Mt. Azuma	Sadamisaki Lighthouse
Jougasaki Coast	Yoshigadaira Wetlands	Goshikidai Plateau
Aokigahara Jukai Forest	*Imperial Tourist Monument*	Chichibugahama Beach
Cape Irozaki	*Gomiikehafu Highland Park*	*Naruto Strait*
Dogashima Coast		*Seto Ohashi Bridge*
Joren Falls		*Shimanami Sea Road*
Amagi Mountain Range		*Mukaishima Island*
Shimoda Park		
Lake Tanuki		
Mt. Taikanzan		
Cape Kogane		

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Mountain activity type (30 destinations in total across the three parks)		
Fuji-Hakone-Izu: 5 destinations	**Setonaikai: 14 destinations**	**Joshin'etsukogen: 11 destinations**
Lake Motosu	Mt. Naeba	Sensuijima Island
Lake Saiko	Mt. Tanigawadake	Esaki Lighthouse
Lake Kawaguchi	Mt. Kamodake	Ushimado
Lake Yamanaka	Mt. Mantaro	*Kanmon Strait*
Asagiri Highland	Mt. Tairappyo	*Shodoshima Island*
	Siga Highland	*Ikuchishima Island*
	Mt. Yakebitai	*Innoshima Island*
	Mt. Nekodake	*Omishima Island*
	Mt. Iwasuge	*Oshima Island*
	Mt. Yokote	*Hakatajima Island*
	Mt. Shiga	*Awajishima Island*
	Yunomaru Highland	
	Ikenotaira Marsh	
	Takamine Highland	

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Diverse motivation type (53 destinations in total across the three parks)		
Fuji-Hakone-Izu: 19 destinations	**Setonaikai: 17 destinations**	**Joshin'etsukogen 17 destinations**
Mt. Fuji	Shima Onsen	Daifudo Cave
Hakone Shrine	Mt. Kusatsu-Shirane	Itsukushima-jinja Shrine
Shikine-jima Island	Manza Onsen	Mt. Misen
Miyake-jima Island	Kazama Onsen	Mt. Ojikatake
Izu Granpal Amusement Park	Mt. Asama	Tomogashima Island
Izu Shaboten Zoo	Kiyotsu Gorge	Kada
Narusawa Ice Cave	Sesshogawara	Yashima Island
Mt. Omuro	Yoneko Falls	Mt. Shiude
Hakone Glass no Mori Venetian Glass Museum	Mt. Shirane	Megijima Island
Hakone-en	Lake Nozoriko	Shiraishi Island
Hakone Sekisho	Minakami Hot Spring Village	Kotohira
Hakone Mototsunomiya	*Kusatsu Onsen*	Abuto-kannon
Ryugu Sea Cave	*Kumanokoutai Shrine*	*Teshima Island*
Yumigahama Beach	*Karuizawa National Wild Bird Sanctuary Forest*	*Naoshima Island*
Hachijo-jima Island	*Jigokudani Yaen-Koen*	*Okunoshima Island*
Izu Oshima Island	*Lake Okushima*	*Yugeshima Island*
Niijima Island	*Lake Tashiro*	*Iwagishima Island*
The Hakone open-air Museum		
Fujisan World Heritage Center		

Italics indicate destinations located within the "ordinary zones," while others are located within the "special zones."

4.3. Factors influencing tourist satisfaction

The factors influencing tourist satisfaction and their direction differed among the tourist destination groups (**Table 5**).

For the landscape type destinations, women tourists, tourists who lived farther away from their destination(s), and tourists who were aware that the destination(s) was designated within the national park had a higher satisfaction level than men tourists, tourists who lived closer to their destination(s), and those who were not aware that the destination(s) was designated within the national park, respectively. Additionally, tourist satisfaction was higher when the destination was in the ordinal zone than when it was in the special zone.

For the mountain activity type destinations, tourists who were women, younger, or aware that the destination(s) was designated within the national park had a higher satisfaction. In contrast to landscape destinations, tourist satisfaction was higher in the mountain activity type destinations when the destination was in the special zone compared with the ordinal zone.

359 Finally, for the diverse motivation-type destinations, tourists who were women, younger,
360 lived farther away from the destination(s), or were aware that the destination(s) was designated
361 within the national park had a higher satisfaction.
362
363 **Table 5**. Summary of ordinal logit regression models relating tourist satisfaction with gender, age,
364 distance from the tourist's residential area to the destination, awareness of the national park, and
365 level of protection in each destination.

Landscape type	Coefficient	SE	*p* value	Odds ratio
Gender (women)	0.643	0.068	< 0.001***	1.90
Age	−0.004	0.003	0.163	0.99
Distance to the tourist destination	0.109	0.032	< 0.01**	1.12
Awareness of the national park (yes)	0.737	0.063	< 0.001***	2.09
Level of protection (special zone)	−0.311	0.076	< 0.001***	0.73

366

Mountain activity type	Coefficient	SE	*p* value	Odds ratio
Gender (women)	0.394	0.076	< 0.001***	1.48
Age	−0.006	0.003	< 0.05*	0.99
Distance to the tourist destination	0.065	0.034	0.056	1.07
Awareness of the national park (yes)	0.663	0.069	< 0.001***	1.94
Level of protection (special zone)	0.219	0.072	< 0.01**	1.24

367

Diverse motivation type	Coefficient	SE	*p* value	Odds ratio
Gender (women)	0.653	0.066	< 0.001***	1.92
Age	−0.007	0.002	< 0.01**	0.99
Distance to the tourist destination	0.135	0.030	< 0.001***	1.14
Awareness of the national park (yes)	0.823	0.061	< 0.001***	2.28
Level of protection (special zone)	−0.132	0.071	0.063	0.88

368 ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.
369 In the model, when the explanatory variable was categorical, the results were compared with an
370 optional reference category. The reference categories are "men" (gender), "no" (awareness of the
371 national park), and "ordinary zone" (level of protection).

5. Discussion

The most common motivation for visiting the national parks was "to enjoy the scenery," suggesting that tourist destinations within national parks are widely perceived as scenic spots (**Fig. S4**). Given that approximately 60% of the respondents were unaware that their destinations were located within national parks (**Table S3**), it is likely that people did not necessarily decide to visit these destinations because they were situated in national parks.

Women consistently showed higher satisfaction than men across all destination groups, revealing a gender disparity in satisfaction (**Table 5**). Previous studies have also highlighted variations in attitudes towards ecotourism and associated services based on gender (Del Mar Alonso-Almeida, 2013; Quynh et al., 2021). Gender disparities in satisfaction could be attributed to women's greater experience in visiting nature and sensitivity to the natural environment compared with men (Zelezny et al., 2000). Furthermore, women tend to experience higher social and aesthetic satisfaction, whereas men tend to experience higher physical satisfaction (Kobayashi, 1993). Indeed, specific motivations for visiting that exhibited significant gender disparity in the present study were "to enjoy the scenery" and "to observe unique flora and fauna" (**Fig. S6**), aligning with the higher social and aesthetic sensitivity of women compared with men, as suggested in previous studies (Zhang et al., 2023).

Older tourists had lower satisfaction with mountain activities and diverse motivation types than younger tourists (**Table 5**). Accumulated experiences with increasing age may explain this observation. Previous studies have suggested a reciprocal influence between age and ecotourism (Lawton, 2002; Vigolo et al., 2018); individuals with extensive life experiences, typically associated with older age, may find it challenging to have experiences that exceed their expectations before their recent visits.

Tourists who resided far from their destinations had a higher satisfaction in the landscape and diverse motivation types compared with those who resided nearby (**Table 5**). This could be attributed to the cost difference associated with traveling to the destinations. A critical difference between visits to closer and more distant residential areas is the overall cost of travel, which includes transportation and accommodation. In the case of travel that incurs significant costs, sightseeing plans at the destination should likely be made well before departure. If a predetermined sightseeing plan is successfully implemented, tourists may achieve higher satisfaction. Previous studies have shown that higher travel costs are correlated with higher overall satisfaction (Acharya et al., 2023; Mutanga et al., 2017), suggesting that higher expenses for distant travel may positively impact tourist satisfaction.

Across all destination groups, individuals who were aware that the tourist destination was situated within a designated national park reported higher satisfaction than those who were unaware (**Table 5**). This underscores the significance of pre-visit information. Those who were informed about the designated area before their visit likely acquired information through various channels such as advertisements, word-of-mouth, tourist guides, and other sources. This pre-visit information can provide clarity regarding the features and activities available at the destination, contributing to meeting or even exceeding visitors' expectations and elevating satisfaction levels. Previous studies have also highlighted the positive influence of pre-visit information on ecotourism experiences (Castellanos-Verdugo et al., 2016; Ezebilo, 2013), highlighting its potential impact on tourist satisfaction.

The effect of the level of protection on satisfaction varied among the destination groups (**Table 5**), indicating that the desired protection level varies depending on the specific needs of the

tourist destination. In the landscape type destinations, a trend emerged where satisfaction was lower in "special zones." In particular, for visit motivations such as "to enjoy the scenery" and "to enjoy a drive or tour," the protection level significantly influenced satisfaction (**Fig. S7**). For instance, in cases where the motivation was "to enjoy a drive or tour," areas with less stringent regulations and well managed and good infrastructures (such as roads and bridges) appeared to be more satisfying for the tourists. Conversely, in the mountain type destinations, "special zones" tended to yield higher satisfaction levels. Mountain type destinations often attract individuals interested in camping, skiing, or snowboarding which entail direct interactions with nature.

Thus, by conducting a destination-specific analysis, this study provides a comprehensive picture of tourist satisfaction and its determinants across major national parks in Japan. In particular, we demonstrated that the effect of protection level on tourist satisfaction varies depending on the destination group. For instance, in landscape-type destinations such as the Seto Ohashi Bridge, tourists may enjoy scenery from the bridge and other built infrastructures. Tourist satisfaction with landscape-type destinations would thus increase in destinations located within ordinary zones. In contrast, in mountain activity-type destinations, such as the Shiga Highland, a preference for more immersive, natural landscapes may be important for meeting tourist demands. Tourist satisfaction for this destination type would thus be enhanced in destinations located within special zones. Our results underscore the importance of destination analysis to fully understand visitors' demands and satisfaction in ecotourism.

This study has several limitations. First, the study was confined to only three parks. Expanding the scope to encompass a broader range of parks would not only enhance the effectiveness of comparing and validating the results but also provide a more comprehensive understanding of tourist behavior. Second, the factors examined in our study may not independently and directly influence tourist satisfaction. Satisfaction is a multidimensional emotional response, as highlighted by Xu et al. (2021). Therefore, it remains unclear on which specific dimensions the factors studied here have an impact. Moreover, certain factors beyond those considered in this study, such as observed biota, crowd levels, and on-site employees' attitudes, have been previously reported to influence visitor satisfaction (Oviedo-García et al., 2019; Prakash et al., 2019; Torres-Sovero et al., 2012). To gain a more comprehensive understanding of tourist satisfaction, additional research, such as conducting multiple surveys before and after the tourist experience to track temporal changes, are necessary, as suggested by Albayrak and Caber (2018).

6. Conclusions

This study sheds light on tourist dynamics, including their motivations for visiting and satisfaction levels, thereby providing valuable insights into enhancing overall tourist satisfaction within national parks. Tourist satisfaction generally increased with greater distance from the tourist residential area to the destination. Additionally, tourists who were aware that the destination was situated within a designated national park reported higher satisfaction levels than those who were unaware. These results collectively suggest that increasing awareness about national parks and the associated knowledge input from visual, verbal, and sensory stimuli, including advertisements and television programming, will help enhance tourist satisfaction and improve economic circulation in rural areas by increasing tourism from outside the region.

Furthermore, we demonstrated that the effect of protection level on tourist satisfaction varies depending on the destination group and tourists' motivation for visiting. This underscores the importance of tailoring management strategies to address the unique requirements of different

destinations within a park, thereby facilitating tourist satisfaction and experience. Our study advances the understanding of tourist satisfaction through a destination-specific analysis in PAs. Enhancing tourist satisfaction should be a cornerstone of sustainable tourism in PAs, and this study thus provides a valuable foundation for future research and management initiatives.

Data availability statement

The data supporting the results in this paper will be archived in the data depository at the time of acceptance, and the data DOI will be included.

Ethical Approval

This study and included questionnaire procedures met the requirements by the Ethics Committee of the corresponding author's institution.

Author contributions

Conceptualization: MS
Data curation: MS
Formal analysis: MS and MT
Writing - Original Draft: All authors
Writing - Review & Editing: All authors

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Declaration of interest

The authors declare that they have no conflict of interest.

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