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Valuing the Forest Recreation Function in South Korea: Willingness to Pay and Its Determinants

Sooil Park ¹ , Yeonhee Lee ^{1,*}, Sujin Park ¹  and Jaehyun Kim ² 

¹ Forest Human Service Division, Future Forest Strategy Department, National Institute of Forest Science, Seoul 02455, Republic of Korea; wce5644@naver.com (S.P.); snowshoe@korea.kr (S.P.)

² Gardens and Education Research Division, Korea National Arboretum, Pocheon 11186, Republic of Korea; jkim20@korea.kr

* Correspondence: shinerlee@korea.kr

Abstract

Forest recreation is a key public-benefit function of forests, but as a non-market good, evidence of the public's willingness to pay (WTP) for its sustained provision remains scarce. This study applied the double-bounded dichotomous choice contingent valuation method to estimate WTP for the forest recreation function and identify its determinants. In September 2025, a nationwide online survey presented a hypothetical continued-provision scenario to 1050 adults aged 20–74 across South Korea's 17 metropolitan and provincial regions and elicited WTP as a per-visit fee. Sociodemographic characteristics, awareness, use experience, satisfaction, perceived effects, and forest ecological sensitivity were examined, with a parallel analysis excluding 192 protest respondents. Mean stated WTP was KRW 17,418 (approximately USD 12.3). Household income, awareness, satisfaction with rest and leisure in forests, and forest ecological sensitivity were statistically significant determinants. After protest responses were excluded, mean stated WTP was KRW 21,483 (approximately USD 15.1), and use experience emerged as an additional significant determinant. These findings provide empirical evidence on stated WTP under a hypothetical per-visit payment scenario and may inform forest recreation service design and assessment of forests' public-benefit functions.

Keywords: forest recreation functions; contingent valuation; double-bounded dichotomous choice; willingness to pay; determinants

1. Introduction

South Korea is a forested country, with approximately 63% of its territory covered by forests, providing accessible recreational spaces for its citizens. Recreational activities in forests promote physical and mental health through walking, scenery viewing, and strolling, contributing to emotional restoration [1]. Sensory experiences at forest recreation sites lead to feelings of restoration and visit satisfaction [2]. In urban forests, the quality of the recreational experience enhances subjective well-being and life satisfaction through restorative experiences [3]. Accordingly, the number of visitors to recreation forests in South Korea—areas developed to promote emotional well-being, public health, rest, and forest education—rose from approximately 11.61 million in 2012 to about 19.98 million in 2024 [4]. This increase reflects societal shifts toward expanded leisure time, urbanization, and a growing number of citizens seeking nature amid chronic stress.

Forest recreation is classified as a principal function in the domestic assessment of public-benefit functions of forests [5]. The FAO's Global Forest Resources Assessment



Academic Editor: Dan Zhang

Received: 27 July 2026

Revised: 18 August 2026

Accepted: 19 August 2026

Published: 21 August 2026

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categorizes forest management objectives into production, soil and water resource protection, biodiversity conservation, and social services, where recreation is a core item under social services [6]. However, forest recreation is a non-market good whose value is difficult to measure through market prices. To leverage the social value of forest recreation in policy resource allocation and budget planning, a demand-side valuation based on citizens' willingness-to-pay (WTP) is necessary.

The contingent valuation method (CVM) serves as a representative stated-preference technique for quantitatively estimating the social value of non-market goods. By presenting respondents with a hypothetical market scenario and surveying the maximum amount they would be willing to pay for a good or service, CVM can capture both actual use value and non-use value, including existence and bequest value [7,8]. Among its formats, the dichotomous-choice format, which asks about WTP for a specified amount, imposes a low response burden and closely resembles actual market purchase decisions; it is therefore a standard technique for valuing environmental goods [9]. The double-bounded dichotomous choice (DBDC) format, which adjusts the second bid based on the first response, offers higher estimation efficiency than the single-bounded (SB) format [10].

Based on these methodological advantages, CVM has been employed to estimate the value of various forest recreation resources in South Korea and abroad. Domestically, studies applying dichotomous-choice CVM to Provincial Park to estimate recreational benefits [11] have been followed by studies applying the Turnbull distribution-free model to visitors of National Park [12] and estimating forest-trail users' WTP for trail development [13]. The valuation objects have expanded beyond specific facilities to include studies estimating the value of the forest landscape function using a conditional logit model [14], addressing the conservation value of recreation forests [15], analyzing the value of recreation forests within a nature-conservation zone [16], and examining the existence of non-use value in recreation resources [17].

Valuation of forest recreation resources has been conducted internationally. Studies have estimated recreational benefits in urban forests [18] and explained urban-forest visitors' WTP using the theory of planned behavior [19]. Research has also estimated WTP for national park entrance fees and the recreational value of forest parks [20,21].

Meta-analyses synthesizing outdoor recreation value and analyses of forest CVM studies indicate that WTP varies by forest type, region, survey mode, and respondent characteristics [22–25]. Among sociodemographic characteristics, income has consistently been linked to increased WTP [20,21,26,27]. Educational attainment, age, and intention to visit in the future have been identified as significant determinants in some studies [20,27,28]. Psychological and attitudinal factors, such as respondents' perceptions, experiences, and values, are significantly associated with WTP [29,30]. Specifically, interest in and experience with forest recreation resources [16], attitudes toward natural resource use, participation in environmental organizations [21,31], and evaluations of recreation services [32,33] are associated with variations in WTP. Thus, WTP for forest recreation is associated with diverse factors, necessitating consideration of respondents' perceptions, experiences, and values regarding nature in valuation.

Although previous studies have examined various valuation targets and determinants of WTP, most have focused on specific forest recreation sites—such as recreation forests, national parks, and forest trails—or visitors to those sites. While useful for estimating the use value of individual forest recreation resources, these studies limit the capture of broader social benefits provided by the forest recreation function to the general public. From a policy perspective, the primary management target should be the forest recreation function itself; however, studies evaluating its social value at the population level remain limited.

Accordingly, this study identifies the forest recreation function, rather than specific recreation facilities, as the valuation object. Using the DBDC CVM on a nationwide sample of Korean adults, this study estimates WTP for the forest recreation function. It examines determinants of WTP, including sociodemographic characteristics and perceptions, experiences, and attitudes toward forest recreation. This approach represents an empirical extension of previous site- and visitor-focused studies and provides evidence on stated WTP for the forest recreation function under the specified hypothetical payment scenario in South Korea.

2. Materials and Methods

2.1. Survey Participants and Data Collection

This study applied the DBDC CVM to identify WTP for the sustained provision of the forest recreation function and its determinants.

To determine the initial bids for the main survey, a pilot survey was conducted with a separate sample of 100 adults from 20 to 26 August 2025. After being presented with a hypothetical scenario regarding the sustained provision of the forest recreation function, respondents indicated the amount they would be willing to pay as a per-visit fee in open-ended form. After excluding two protest responses, 98 responses were used to inform the bid design. Based on the distribution of the pilot survey results, the initial bids for the main survey were set at seven levels: KRW 1000, 3000, 5000, 10,000, 20,000, 30,000, and 50,000.

The main survey was conducted from 10 to 24 September 2025 using an online questionnaire administered to adults aged 20–74 across all 17 metropolitan and provincial regions of South Korea. The sample was stratified by sex, age, and place of residence, and regional quotas were allocated using the square-root proportional allocation method, yielding a final sample of 1050 respondents. The seven initial bids established through the pilot survey were randomly assigned to 150 respondents each. To assess representativeness, the sample distributions by sex, age, and place of residence were compared with the corresponding distributions of the resident-registration population aged 20–74 in South Korea as of September 2025.

Data were collected anonymously by a professional research company. Before beginning the questionnaire, respondents were provided with information about the purpose of the study, the voluntary nature of participation, and the anonymous handling of their responses. Respondents who chose to proceed participated in the survey voluntarily. No personally identifiable or sensitive information was collected.

2.2. Hypothetical Scenario and Payment Vehicle

The object of valuation in this study was not a specific recreation facility or individual program but the continued provision of the forest recreation function and the maintenance and improvement of its service level, which contribute to citizens' rest and enhance their quality of life. After explaining to respondents the social benefits of the forest recreation function and the need for its ongoing provision and improvement, a hypothetical scenario was presented in which a certain level of cost-bearing would be necessary for the expansion and improvement of recreation facilities, enhancement of program quality, and maintenance and conservation of the forest environment.

The payment vehicle in this scenario was established as a per-visit fee. This hypothetical fee was not tied to a specific recreation forest or individual program but represented the cost per visit for the continued provision and improvement of the forest recreation function. In CVM, the payment vehicle should allow respondents to understand how the cost of the valuation object would be borne and should be plausible within the relevant decision context [7,34]. In South Korea, the Forestry Culture and Recreation Act permits

natural recreation forests to collect entrance fees, facility-use fees, and experience fees [35]. Alternative payment vehicles were also considered. General taxation could reflect the collective financing of a nationwide public-benefit function. However, a national-level forest recreation valuation study in Poland argued that tax- or donation-based payment vehicles could generate a large number of protest responses where trust in public institutions and environmental organizations was limited and therefore adopted an entrance fee as the payment vehicle [36]. An annual membership fee could provide a clearly defined annual payment schedule for continued access; however, it was not adopted in the present study because it implies repeated use and was less consistent with a target population that included occasional users and non-users. Accordingly, a per-visit fee was selected because it was consistent with existing payment practices, provided a clear unit and timing of payment, and had been used in previous forest recreation valuation studies [27,36–38]. Nevertheless, because the valuation object was the broader forest recreation function rather than an identifiable site or service, the per-visit fee remained a non-site-specific hypothetical payment vehicle. The resulting WTP estimates should therefore be interpreted within the context of this valuation scenario.

Based on the scenario constructed with this payment vehicle, WTP, sociodemographic characteristics, awareness and experience of forest recreation, perceived effects of forest recreation, and attitudinal variables were collected through the survey to estimate WTP and analyze determinants.

2.3. Elicitation Format and Bid Design

This study employed the DBDC question format to elicit WTP. In this format, respondents answer “yes” or “no” to a proposed amount, reducing response burden and simulating the market situation in which a consumer decides whether to purchase at a given price [9,39]. The DBDC format offers a second bid that is adjusted based on the first response, allowing for more precise identification of a respondent’s WTP bounds than the single-bounded format [10]. In this study, respondents who answered “yes” to the first bid received a second bid twice the initial amount, while those who answered “no” received a second bid half the initial amount.

The pilot WTP distribution was strongly right-skewed, with responses concentrated in the lower range and a sparse upper tail extending to KRW 300,000 (Figure 1). The seven initial bid levels were distributed across the main concentration and upper range of the pilot responses. Of the pilot responses, 87.8% fell within the initial bid range of KRW 1000–50,000. Applying the reciprocal follow-up adjustments of twice and half the initial bid extended the full range of presented amounts to KRW 500–100,000, as indicated by the shaded area in Figure 1. This range covered 94.9% of the pilot responses, with 3.1% exceeding the highest presented amount and 2.0% falling below the lowest. In the DBDC estimation, Y-Y and N-N responses were treated as right- and left-censored intervals, respectively, rather than being assigned the corresponding boundary values.

The bid structure is detailed in Table 1. This design classifies responses into four categories: yes–yes (Y-Y), yes–no (Y-N), no–yes (N-Y), and no–no (N-N).

Table 1. Bid design.

Initial Bid (KRW)	Lower Bid (KRW)	Upper Bid (KRW)
1000	500	2000
3000	1500	6000
5000	2500	10,000
10,000	5000	20,000
20,000	10,000	40,000

Table 1. Cont.

Initial Bid (KRW)	Lower Bid (KRW)	Upper Bid (KRW)
30,000	15,000	60,000
50,000	25,000	100,000

KRW, Korean Won.

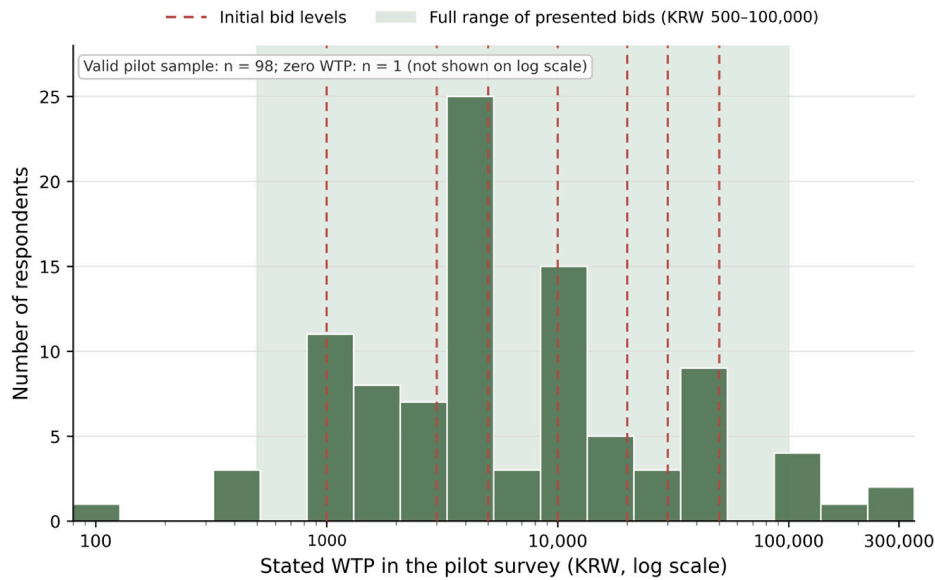


Figure 1. Distribution of open-ended Willingness-to-pay (WTP) responses used for bid design in the pilot survey. Red dashed lines indicate the seven initial bid levels used in the main survey, and the shaded area indicates the full range of presented amounts, including the doubled and halved follow-up bids.

2.4. Variable Composition and Analytical Model

The definitions and coding of the main variables used in this study’s analysis are presented in Table 2.

Table 2. Definitions and coding of variables used in the analysis.

Category	Variable	Coding	Models Included
Dependent variable	Willingness to pay	No = 0, Yes = 1	Models 1, 2, 3
	Bid amount	First bid: KRW 1000–50,000 Second bid: KRW 500–100,000	
Independent variables	Sex	Male = 0, Female = 1	Models 2, 3
	Age group	① 20s ② 30s ③ 40s ④ 50s ⑤ 60s and older	
	Educational attainment	① Middle school or below ② High school graduate ③ University graduate ④ Graduate school	
	Monthly average household income	① <KRW 1 million ② KRW 1–2 million ③ KRW 2–3 million ④ KRW 3–4 million ⑤ KRW 4–5 million ⑥ KRW 5–6 million ⑦ KRW 6–7 million ⑧ KRW 7–8 million ⑨ ≥KRW 8 million	

Table 2. *Cont.*

Category	Variable	Coding	Models Included
Independent variables	Awareness of forest recreation	No = 0, Yes = 1	Model 3
	Use experience of forest recreation	No = 0, Yes = 1	
	Satisfaction with rest and leisure	1 = strongly disagree to 5 = strongly agree	
	Perceived effect on physical health promotion	1 = strongly disagree to 5 = strongly agree	
	Perceived effect on mental health promotion	1 = strongly disagree to 5 = strongly agree	
	Perceived effect on social relationship promotion	1 = strongly disagree to 5 = strongly agree	
	Perceived provision of educational and experiential opportunities	1 = strongly disagree to 5 = strongly agree	
	Perceived contribution to the local community	1 = strongly disagree to 5 = strongly agree	
	Perceived enhancement of ecological value	1 = strongly disagree to 5 = strongly agree	
	Forest ecological sensitivity	1 = strongly disagree to 5 = strongly agree	

The dependent variable was the respondent's willingness to pay the forest recreation fee, treated as a binary variable: assigned "1" if the respondent indicated a WTP for the given bid and "0" if they stated an unwillingness to pay.

The independent variables used to derive determinants of WTP were grouped into four categories. First, sociodemographic variables representing respondents' objective background included: sex, age group, educational attainment, and monthly average household income. Second, awareness of forest recreation, use experience, and satisfaction with leisure in forests were included to examine their associations with WTP. Third, perceptions of the benefits provided by forest recreation were evaluated across six dimensions: promotion of physical health, promotion of mental health, promotion of social relationships, provision of educational and experiential opportunities, contribution to the local community, and enhancement of ecological value. Finally, forest ecological sensitivity was included as a variable reflecting attitudes toward nature and was calculated as the mean score of 10 items from a previously developed scale [40]. The original scale was developed through expert review and exploratory and confirmatory factor analyses, and its three-factor model showed acceptable fit (CFI = 0.940, TLI = 0.916, GFI = 0.953, SRMR = 0.037, and RMSEA = 0.077) [40]. In the present study, the internal consistency of the scale was reassessed using Cronbach's alpha.

For the analytical model, a hierarchical model was employed, entering explanatory variables in three stages to confirm the robustness of the estimation results by comparing changes in the bid coefficient and WTP estimate according to the entry of covariates. Model 1 included only the bid amount to confirm the basic form of the WTP response to price. Model 2 added the sociodemographic variables, while Model 3 served as the full model, entering all awareness and attitudinal variables, including awareness, use experience, satisfaction with leisure, perceived effects, and ecological sensitivity.

2.5. Analytical Methods

A random utility model was used to analyze the WTP data. This model posits that respondents decide whether to accept the presented bid to maximize utility, allowing WTP to be derived from the estimated coefficients [41]. The maximum amount that respondent i can pay is treated as a continuous latent variable that is not directly observed [7,41], expressed in Equation (1).

$$WTP_i = x_i' \beta + \varepsilon_i \quad (1)$$

Here, WTP_i denotes the latent WTP of respondent i , x_i' denotes the vector of sociodemographic characteristics and main variables, β denotes the vector of estimated coefficients, and ε_i denotes the error term.

In the DBDC design, four response types arise from the combination of the first bid and second amount presented as either raised or lowered, depending on the response. Letting B_i denote the first bid, B_i^U the raised amount presented when the first response is “yes,” and B_i^L the lowered amount presented when the first response is “no,” the probabilities of the four response types are given in Equations (2)–(5). Under the assumption that the error term follows a logistic distribution, the log-likelihood function in Equation (6) was constructed and used with the probabilities corresponding to each response type. Here, d_i^{YY} , d_i^{YN} , d_i^{NY} , d_i^{NN} are indicator variables taking a value of “1” when a respondent corresponds to the given response type and “0” otherwise. The parameters were estimated using maximum likelihood estimation (MLE), which maximizes this function [10]. As a robustness check on the distributional assumption, the same three model specifications were also estimated under a standard normal error distribution (probit specification), and the directions and statistical significance of the coefficients, mean WTP estimates, and model fit were compared with those from the logit specification.

$$\pi_i^{YY} = Pr(WTP_i \geq B_i^U) \quad (2)$$

$$\pi_i^{YN} = Pr(B_i \leq WTP_i < B_i^U) \quad (3)$$

$$\pi_i^{NY} = Pr(B_i^L \leq WTP_i < B_i) \quad (4)$$

$$\pi_i^{NN} = Pr(WTP_i < B_i^L) \quad (5)$$

$$\ln L = \sum_i \left[d_i^{YY} \ln(\pi_i^{YY}) + d_i^{YN} \ln(\pi_i^{YN}) + d_i^{NY} \ln(\pi_i^{NY}) + d_i^{NN} \ln(\pi_i^{NN}) \right] \quad (6)$$

This study reported mean WTP as the representative value, as it corresponds to the theoretical expected value of the welfare change, making it suitable for value estimation and benefit comparison [41]. Mean WTP was calculated by Equation (7) using the estimated intercept, the coefficients of the explanatory variables, the sample means of the explanatory variables, and the bid coefficient. Here, α denotes the intercept; K denotes the number of explanatory variables excluding the bid amount; β_k denotes the estimated coefficient of explanatory variable k ; $\bar{x}_k$ denotes the sample mean of that explanatory variable; and β_{bid} denotes the coefficient of the bid variable. The bid coefficient theoretically takes a negative (−) sign, which means that the probability of acceptance declines as the bid increases. However, because the mean can be sensitive to distributional shape, median WTP was presented alongside the mean so the two estimates could be compared [34]. The 95% confidence interval for the mean WTP was calculated using the Krinsky–Robb method, with 10,000 random draws from the estimated variance–covariance matrix of the parameters [42].

Additionally, separate DBDC models including the bid amount as the only explanatory variable were estimated for subgroups defined by forest recreation use experience and awareness to obtain unadjusted subgroup-specific *mean WTP* estimates.

$$\text{Mean WTP} = - \frac{\ln \left[1 + \exp \left(\alpha + \sum_{k=1}^K \beta_k \bar{x}_k \right) \right]}{\beta_{bid}} \quad (7)$$

All statistical analyses were performed using the DCchoice package (version 0.2.0) in R 4.5.2 (R Foundation for Statistical Computing, Vienna, Austria), and statistical significance was judged at the criterion of $p < 0.05$.

2.6. Protest Response Treatment and Sensitivity Analysis

In contingent valuation studies, protest responses may arise when respondents answer “no” not because they value the good being evaluated lowly, but because of objections to the payment vehicle or the proposed funding mechanism [43,44]. Such responses reflect an objection to the payment arrangement rather than a genuine zero valuation of the good and must be distinguished from true zero WTP responses [44]. Prior studies have reported numerous protest responses stemming from a lack of trust in government and environmental organizations [36] and from a public-good perception that access to forests should be free [37]. Treating protest responses as genuine payment refusals can incorporate objections to the payment vehicle or policy mechanism into WTP estimates, potentially biasing them downward. Thus, it is necessary to identify protest responses by examining reasons for payment refusal and assessing the potential impact of protest response treatment on WTP estimates and their interpretation [43,44].

The criteria for identifying protest responses and the methods of treatment differ across studies [45,46]. In this study, considering that the forest recreation function is a public-benefit function providing benefits to all citizens, the full sample of respondents, including those who refused payment, was used for the main analysis. However, responses driven by objections to the payment vehicle or policy implementation, rather than by low preference for the forest recreation function or limited ability to pay, cannot be regarded as genuine zero responses. Accordingly, protest respondents were identified by examining stated reasons for payment refusal among N-N respondents. A sensitivity analysis was conducted on the subsample excluding protest respondents, considering the possibility that WTP estimates and the significance of determinants may vary based on how protest responses are treated.

Respondents who rejected the initial bid were asked to select their first- and second-ranked reasons for payment refusal from nine predefined reasons and an “other” option. Among N-N respondents, protest classification was based only on the first-ranked reason; the second-ranked reason was not used. Respondents whose first-ranked reason was the belief that forests or forest recreation facilities should be freely accessible, the belief that they were already sufficiently funded by taxes or other public resources, distrust of the management of forest recreation facilities through usage fees, or insufficient trust in the government’s forest recreation policy were classified as protest respondents. Respondents whose first-ranked reason was infrequent use of forests or forest recreation facilities, low expectations for the effects of forest recreation, dissatisfaction with the current level of services or facilities, financial difficulty in bearing the cost, or a lack of direct personal benefit from payment were classified as genuine payment refusals. No N-N respondent selected the “other” option as their first-ranked reason.

3. Results

3.1. Respondent Characteristics and Distribution of Key Variables

Table 3 presents the characteristics of the respondents and the distribution of key variables related to forest recreation. Regarding sex, 50.8% of respondents were male, and 49.2% were female. By age group, respondents aged 60 and older accounted for the largest share at 23.3%, followed by those in their 50s (21.2%), 40s (20.1%), 30s (18.1%), and 20s (17.2%). In terms of educational attainment, undergraduate degree holders were the most common at 68.8%, followed by high school graduates (21.8%) and graduate degree holders (8.4%). The most common monthly average household income was in the KRW 3–4 million bracket at 17.0%, followed by KRW 4–5 million (14.8%) and KRW 2–3 million (13.5%).

While 82.9% of respondents were aware of forest recreation, only 29.5% had experienced it, indicating a gap between awareness and actual use. When the combined “agree” and “strongly agree” responses to items measured on a five-point scale were considered positive, 58.8% of respondents expressed satisfaction with rest and leisure in forests. Regarding the perceived effects of forest recreation, the promotion of mental health ranked highest at 76.8%, followed by promotion of physical health (65.7%) and enhancement of ecological value (62.0%). This was followed by contributions to the local community (54.8%), promotion of social relationships (51.8%), and provision of educational and experiential opportunities (46.0%).

Table 3. Distribution of respondent characteristics and key single-item variables (N = 1050).

Variable	Category	N	%	Variable	Category	N	%
Sex	Male	533	50.8	Perceived promotion of physical health	Strongly disagree	13	1.2
	Female	517	49.2		Disagree	43	4.1
Age group	20s	181	17.2		Neutral	305	29.0
	30s	190	18.1		Agree	568	54.1
	40s	211	20.1		Strongly agree	121	11.6
	50s	223	21.2	Perceived promotion of mental health	Strongly disagree	8	0.8
	60s and older	245	23.3		Disagree	36	3.4
Educational attainment	Middle school or below	11	1.0		Neutral	200	19.0
	High school	229	21.8		Agree	514	49.0
	Undergraduate	722	68.8		Strongly agree	292	27.8
	Graduate school	88	8.4		Strongly disagree	7	0.7
Monthly average household income	Less than KRW 1 million	67	6.4	Perceived promotion of social relationships	Disagree	73	7.0
	KRW 1–2 million	95	9.0		Neutral	425	40.5
	KRW 2–3 million	142	13.5		Agree	435	41.4
	KRW 3–4 million	178	17.0		Strongly agree	110	10.4
	KRW 4–5 million	155	14.8	Perceived provision of educational and experiential opportunities	Strongly disagree	9	0.9
	KRW 5–6 million	137	13.0		Disagree	71	6.8
	KRW 6–7 million	92	8.8		Neutral	486	46.3
	KRW 7–8 million	81	7.7		Agree	405	38.6
	KRW 8 million or more	103	9.8		Strongly agree	79	7.4

Table 3. Cont.

Variable	Category	N	%	Variable	Category	N	%
Awareness of forest recreation	No	180	17.1	Perceived contribution to the local community	Strongly disagree	7	0.7
	Yes	870	82.9		Disagree	59	5.6
Experience of forest recreation	No	740	70.5		Neutral	408	38.9
	Yes	310	29.5		Agree	467	44.5
Satisfaction with rest and leisure	Strongly disagree	4	0.4		Strongly agree	109	10.3
	Disagree	35	3.3	Perceived enhancement of ecological value	Strongly disagree	9	0.9
	Neutral	394	37.5		Disagree	49	4.7
	Agree	508	48.4		Neutral	340	32.4
	Strongly agree	109	10.4		Agree	501	47.7
					Strongly agree	151	14.3

The comparison with the resident-registration population is presented in Table S1. The sample closely matched the population distribution by sex, with absolute differences of 0.15 percentage points, while differences across age groups ranged from -3.39 to 2.54 percentage points. Regional differences were relatively larger, ranging from -12.59 to 2.40 percentage points, reflecting the use of square-root proportional allocation.

Table 4 presents the item composition and descriptive statistics of the forest ecological sensitivity scale. The scale's reliability was Cronbach's $\alpha = 0.870$, with a mean across all items of 3.68 (SD 0.61). The item "I think the most valuable asset to pass on to the next generation is nature" yielded the highest mean at 4.01, followed by "I think the forest ecosystem on Earth is unstable at the moment" and "I feel refreshed when I go to the forest," both at 3.94. By contrast, the item "I have purposely searched for data (books or broadcasts) about forests" had the lowest mean at 3.11. Additionally, items corresponding to the integrative stage—"Active participation in forest protection activities in the community" (3.14) and "Look for videos or materials about animals, plants, and forests with interest" (3.20)—also yielded low means.

Table 4. Item composition and descriptive statistics of the forest ecological sensitivity scale.

No.	Item	Mean	SD
1	I like to go to the forest.	3.65	0.87
2	When I go to the forest, I feel comfortable	3.89	0.86
3	I feel refreshed when I go to the forest.	3.94	0.83
4	Humans must live with forests to maintain their lives.	3.90	0.85
5	The balance of the forest ecosystem is very subtle and can be easily broken, so it should be handled carefully	3.98	0.83
6	I think the forest ecosystem on Earth is unstable at the moment.	3.94	0.87
7	I think the most valuable asset to pass on to the next generation is nature.	4.01	0.84
8	I have purposely searched for data (books or broadcasts) about forests.	3.11	1.02
9	Look for videos or materials about animals, plants, and forests that interest you.	3.20	0.96
10	Active participation in forest protection activities in the community.	3.14	1.00
	Overall	3.68	0.61

SD, standard deviation.

3.2. Response Distribution by Bid Level

Table 5 presents the distribution of DBDC responses by initial bid amount. The proportion of Y-Y responses, in which respondents expressed a WTP on both occasions, was highest at 66.0% in the KRW 1000 group, but fell to 6.7% in the KRW 50,000 group. Conversely, the proportion of N-N responses, where respondents refused payment on both occasions, increased from 8.0% in the KRW 1000 group to 58.0% in the KRW 50,000 group. This pattern aligns with the theoretical prediction that the probability of acceptance declines with increasing bid amount.

Table 5. Double-bounded dichotomous choice (DBDC) response distribution by bid amount.

Bid Amount (KRW)	Y-Y	Y-N	N-Y	N-N	N
	N (%)	N (%)	N (%)	N (%)	
1000	99 (66.0)	33 (22.0)	6 (4.0)	12 (8.0)	150
3000	66 (44.0)	43 (28.7)	9 (6.0)	32 (21.3)	150
5000	38 (25.3)	65 (43.3)	13 (8.7)	34 (22.7)	150
10,000	41 (27.3)	47 (31.3)	18 (12.0)	44 (29.4)	150
20,000	28 (18.7)	39 (26.0)	23 (15.3)	60 (40.0)	150
30,000	10 (6.7)	33 (22.0)	30 (20.0)	77 (51.3)	150
50,000	10 (6.7)	28 (18.6)	25 (16.7)	87 (58.0)	150
Total	292 (27.8)	288 (27.4)	124 (11.8)	346 (33.0)	1050

3.3. Reasons for Payment Refusal and Classification of Protest Responses

Table 6 presents the distribution of first-ranked reasons for payment refusal stated by 346 N-N respondents. The most frequently selected reason was the belief that forests or forest recreation facilities should be freely accessible (116 respondents, 33.7%). The results categorizing perceived entitlement to free access, the belief that costs should be covered by taxes, distrust of facility management, and distrust of policy as protest responses are presented in Table 7. Of the 346 N-N respondents, 192 (55.5%) were classified as protest respondents, while the remaining 154 (44.5%) were classified as genuine payment refusals. Consequently, the sample for the sensitivity analysis included 858 respondents.

Table 6. Distribution of first-ranked reasons for payment refusal among N-N respondents.

No.	Reason for Payment Refusal	N	%
1	I believe forests or forest recreation facilities should be freely accessible.	116	33.7
2	I am unlikely to use forests or forest recreation facilities often.	52	15.0
3	I have low expectations for the effects of forest recreation.	15	4.3
4	I am not satisfied with the current level of services of facilities.	25	7.2
5	I believe they are already sufficiently funded by taxes or other public resources.	43	12.4
6	I do not trust the management of forest recreation facilities through usage fees.	23	6.6
7	I find it financially difficult to bear the cost.	35	10.1
8	I feel that paying would not directly benefit me.	27	7.8
9	I have insufficient trust in the government's forest recreation policy.	10	2.9
	Total	346	100.0

Table 7. Classification of protest respondents and genuine payment refusals among N-N respondents.

Category	N	%
Protest respondents	192	55.5
Genuine payment refusals	154	44.5
Total	346	100.0

3.4. WTP for the Forest Recreation Function and Its Determinants

Table 8 presents the results of the DBDC logit models estimated for the full sample of 1050 respondents. Across all models, the bid coefficient was negative and statistically significant, indicating a lower probability of acceptance at higher bid amounts.

Table 8. DBDC logit model estimation results—full sample (N = 1050).

Variable	Model 1			Model 2			Model 3		
	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic
Intercept	1.011	0.070	14.45 ***	0.528	0.349	1.512	−2.378	0.552	−4.305 ***
Bid amount	−0.074	0.003	−23.40 ***	−0.075	0.003	−23.418 ***	−0.078	0.003	−23.484 ***
Sex				−0.091	0.117	−0.777	−0.095	0.121	−0.784
Age group				0.045	0.042	1.077	0.015	0.044	0.348
Educational attainment				−0.036	0.109	−0.335	−0.086	0.112	−0.768
Household income				0.100	0.027	3.744 ***	0.063	0.028	2.275 *
Awareness of forest recreation							0.698	0.173	4.040 ***
Experience of forest recreation							0.109	0.152	0.716
Satisfaction with rest and leisure							0.264	0.110	2.390 *
Perceived promotion of physical health							−0.152	0.114	−1.335
Perceived promotion of mental health							0.016	0.104	0.152
Perceived promotion of social relationships							−0.005	0.098	−0.048
Perceived provision of educational and experiential opportunities							0.099	0.100	0.987
Perceived contribution to the local community							0.043	0.105	0.413
Perceived enhancement of ecological value							−0.018	0.097	−0.181
Forest ecological sensitivity							0.509	0.165	3.087 **
Mean WTP (KRW)	17,777			17,731			17,418		
Median WTP (KRW)	13,603			13,611			13,560		
WTP 95% CI (KRW)	16,524–19,200			16,448–19,150			16,174–18,815		
Log-likelihood	−1510.8			−1502.0			−1459.6		
AIC	3025.7			3016.1			2951.2		
N	1050			1050			1050		

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. AIC, Akaike information criterion; CI, confidence interval; WTP, willingness to pay; KRW, Korean Won.

In Model 3, household income ($\beta = 0.063$, $p < 0.05$), awareness of forest recreation ($\beta = 0.698$, $p < 0.001$), satisfaction with rest and leisure ($\beta = 0.264$, $p < 0.05$), and forest

ecological sensitivity ($\beta = 0.509$, $p < 0.01$) were significantly and positively associated with WTP. By contrast, sex, age group, educational attainment, experience of forest recreation, perceived promotion of physical health, perceived promotion of mental health, perceived promotion of social relationships, perceived provision of educational and experiential opportunities, perceived contribution to the local community, and perceived enhancement of ecological value were not identified as statistically significant determinants of WTP.

With covariates added stepwise, mean WTP was estimated at KRW 17,777 in Model 1, KRW 17,731 in Model 2, and KRW 17,418 in Model 3, indicating minimal differences across models. The bid coefficient remained stable between -0.074 and -0.078 , and model fit (AIC) improved as covariates were added. The Krinsky–Robb 95% confidence interval for mean WTP in Model 3 was KRW 16,174–18,815.

Table 9 presents mean WTP estimates by forest recreation use experience and awareness in the full sample. Mean WTP was estimated at KRW 25,402 (approximately USD 17.9) for respondents with use experience and KRW 15,043 (approximately USD 10.6) for those without use experience. By awareness, mean WTP was estimated at KRW 19,697 (approximately USD 13.9) among respondents who were aware of forest recreation and KRW 9118 (approximately USD 6.4) among those who were not aware of it.

Table 9. Mean WTP by forest recreation use experience and awareness (full sample).

Group	N	Mean WTP (KRW)	95% CI (KRW)
Use experience: Yes	310	25,402	22,175–29,376
Use experience: No	740	15,043	13,600–16,570
Awareness: Yes	870	19,697	18,265–21,277
Awareness: No	180	9118	7295–11,437

Values are unadjusted subgroup-specific mean WTP estimates based on the baseline specification, in which the bid amount was the only explanatory variable. Confidence intervals were obtained using the Krinsky–Robb method with 10,000 replications.

3.5. Sensitivity Analysis Excluding Protest Respondents

The results of the sensitivity analysis on the 858 respondents, excluding the 192 protest respondents, are presented in Table 10. Across all models, the bid coefficient was negative and statistically significant, indicating a lower probability of acceptance at higher bid amounts.

Table 10. DBDC logit model estimation results—protest respondents excluded (N = 858).

Variable	Model 1			Model 2			Model 3		
	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic
Intercept	1.469	0.079	18.49 ***	0.926	0.389	2.380 *	−1.251	0.616	−2.030 *
Bid amount	−0.078	0.003	−23.62 ***	−0.078	0.003	−23.628 ***	−0.081	0.003	−23.627 ***
Sex				0.023	0.131	0.174	0.048	0.134	0.360
Age group				0.064	0.046	1.392	0.044	0.049	0.893
Educational attainment				−0.055	0.122	−0.454	−0.121	0.125	−0.967
Household income				0.099	0.030	3.303 ***	0.068	0.031	2.183 *
Awareness of forest recreation							0.654	0.191	3.431 ***
Experience of forest recreation							0.375	0.173	2.171 *
Satisfaction with rest and leisure							0.320	0.123	2.609 **

Table 10. Cont.

Variable	Model 1			Model 2			Model 3		
	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic	Coefficient	Std. Error	Wald Z-Statistic
Perceived promotion of physical health							−0.146	0.131	−1.115
Perceived promotion of mental health							0.059	0.116	0.509
Perceived promotion of social relationships							−0.055	0.108	−0.510
Perceived provision of educational and experiential opportunities							0.164	0.122	1.467
Perceived contribution to the local community							−0.062	0.119	−0.524
Perceived enhancement of ecological value							−0.059	0.109	−0.539
Forest ecological sensitivity							0.316	0.186	1.701
Mean WTP(KRW)	21,539			21,531			21,483		
Median WTP(KRW)	18,877			18,917			19,110		
WTP 95% CI(KRW)	20,024–23,234			20,024–23,238			19,992–23,179		
Log-likelihood	−1336.8			−1329.7			−1299.2		
AIC	2677.7			2671.5			2630.4		
N	858			858			858		

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

In Model 3, household income ($\beta = 0.068$, $p < 0.05$), awareness of forest recreation ($\beta = 0.654$, $p < 0.001$), experience of forest recreation ($\beta = 0.375$, $p < 0.05$), and satisfaction with rest and leisure ($\beta = 0.320$, $p < 0.01$) were significantly and positively associated with WTP. Compared to the main analysis, the experience of forest recreation emerged as a new significant factor. By contrast, forest ecological sensitivity retained its direction ($\beta = 0.316$) but was not statistically significant. Additionally, sex, age group, educational attainment, perceived promotion of physical health, perceived promotion of mental health, perceived promotion of social relationships, perceived provision of educational and experiential opportunities, perceived contribution to the local community, and perceived enhancement of ecological value were not significantly associated with WTP.

Mean WTP was estimated at KRW 21,539 in Model 1, KRW 21,531 in Model 2, and KRW 21,483 in Model 3, all higher than estimates for the full sample. The Krinsky–Robb 95% confidence interval based on Model 3 was KRW 19,992–23,179, which did not overlap with the full-sample confidence interval of KRW 16,174–18,815.

3.6. Robustness Check Using the Probit Specification

As a robustness check, the three model specifications were re-estimated using the probit specification. The probit models produced the same pattern of statistically significant determinants as the logit models in both samples (Table S2). In Model 3, mean WTP under the probit specification was estimated at KRW 19,400 (approximately USD 13.7; 95% CI: KRW 18,071–20,875) for the full sample and KRW 24,024 (approximately USD 16.9; 95% CI: KRW 22,436–25,787) after protest responses were excluded. The corresponding logit estimates were KRW 17,418 and KRW 21,483, respectively. The logit specification yielded lower AIC values than the probit specification in both the full sample (2951.155 vs. 3016.844) and the protest-response-excluded sample (2630.422 vs. 2676.934).

4. Discussion

This study analyzed WTP for the sustained provision of the forest recreation function and its determinants using the DBDC CVM with 1050 adults nationwide. The full sample of respondents served as the main analysis, and the sensitivity of the results to protest response treatment was examined by excluding protest respondents. Based on these results, this chapter discusses the estimated WTP for the forest recreation function, the determinants of WTP for this function, and the sensitivity analysis of the protest response treatment.

4.1. Implications of the Estimated WTP for the Forest Recreation Function

The WTP for the forest recreation function estimated in this study was KRW 17,418 (approximately USD 12.3).

Existing domestic CVM studies related to forest recreation have surveyed users who visited specific recreation resources. A study surveying entrance-fee-type WTP among 309 visitors to a National Park estimated a per-visit WTP of KRW 13,056 (approximately USD 9.2) [12]. Another study estimating WTP for a trail development fund among 723 visitors to the East–West Trail reported a WTP of KRW 30,087 (approximately USD 21.2) [13]. Additionally, a study targeting recreation forests in the Chungbuk region reported an annual recreation value of KRW 16,543 (approximately USD 11.6) per person [15].

Internationally, a study of tourists visiting an urban forest in Savannah, USA, reported a mean WTP of USD 11.25 [27], which is similar to our estimate. By contrast, a study of visitors to a forest park in Iran reported a mean WTP of USD 2.08–2.47 [31], and visitors to Irish forests indicated a WTP of IR£1.07–1.65 (approximately USD 1.7–2.6) per visit at the time of the survey [37], both lower than the present estimate.

As noted, estimates of forest recreation value vary considerably based on the survey context. Comparison with domestic studies indicates differences in the objects of valuation, such as recreation forests and forest trails, as well as variations in payment vehicles, including development funds and annual payment amounts. Moreover, international studies reflect differences in income levels and prices; a meta-analysis synthesizing forest CVM studies has confirmed that WTP varies by forest type, region, and survey mode [24].

Furthermore, while prior studies surveyed visitors, this study estimated stated WTP by including a sample without use experience. Therefore, the results of this study cannot be directly compared with those of prior studies, and this estimate should be interpreted as mean stated WTP under the hypothetical per-visit payment scenario rather than as a definitive value assigned by the entire population to the forest recreation function.

4.2. Determinants of WTP for the Forest Recreation Function

Household income, awareness of forest recreation, satisfaction with rest and leisure in forests, and forest ecological sensitivity were identified as determinants of WTP for the forest recreation function. This indicates that WTP is associated with multiple factors: ability to pay, awareness of the service, satisfaction derived from actual use, and values toward nature.

First, the significant positive association between household income and WTP is consistent with the greater capacity to bear costs at higher income levels. In CVM research, income is regarded as a key variable reflecting ability to pay. Studies on WTP for natural resources and ecosystem services have similarly identified a positive association between income level and WTP [19,29]. Therefore, when designing cost-sharing mechanisms for forest recreation, policies such as subsidy and voucher schemes may be considered to reduce potential disparities in access based on income level.

Additionally, awareness was assessed by asking respondents whether they were aware of forest recreation. Those who were aware demonstrated significantly higher WTP ($\beta = 0.698, p < 0.001$). In valuations of other public goods, prior knowledge of the valuation object has also been found to be positively associated with WTP [47]. In this survey, the awareness rate for forest recreation was 82.9%, whereas the actual use experience rate was only 29.5%, revealing a substantial difference. The subgroup analysis further showed that mean WTP was KRW 25,402 among respondents with use experience and KRW 15,043 among those without use experience. Similarly, mean WTP was KRW 19,697 among respondents who were aware of forest recreation and KRW 9118 among those who were not. This indicates that stated WTP was also observed among respondents without use experience. However, because the subgroup estimates were unadjusted and use experience was not statistically significant in the full covariate-adjusted model, the higher WTP among respondents with use experience should not be interpreted as an independent effect of use experience. Given the substantial gap between awareness and actual use, improving accessibility and providing practical information on recreation sites, programs, reservation procedures, and transportation may help connect existing awareness with opportunities for actual use.

Satisfaction with rest and leisure in forests ($\beta = 0.264, p < 0.05$) was also positively associated with WTP, indicating that respondents with higher satisfaction expressed greater WTP. A domestic study examining facility-use satisfaction in recreation forests found no significant association between satisfaction and WTP [15]. However, satisfaction in that study pertained to the evaluation of physical facilities at a specific recreation forest, whereas satisfaction in this study assesses overall experiential satisfaction with forest recreation; thus, direct comparison is limited. This suggests that overall satisfaction with the forest recreation experience may be more closely linked to WTP than satisfaction derived from individual facilities.

The positive association between forest ecological sensitivity and WTP suggests that emotional closeness to forests, along with ecological values and attitudes, may be related to the perceived value of the forest recreation function. Prior studies have found that attitudes toward natural resources tend to be positively associated with WTP for environmental goods and nature-based services [30,48,49]. In South Korea, a valuation study of recreation forests also found that respondents' environmental conservation efforts were significantly and positively associated with WTP [15]. Consequently, when designing future forest recreation services, it may be useful to integrate elements that foster understanding of forest ecosystems and emotional connections to nature.

By contrast, the variables concerning the perceived effects of forest recreation showed no statistically significant associations with WTP. Responses to all six perceived-effect variables were concentrated in the neutral-to-positive categories, which accounted for 92.4%–95.8% of responses. This limited variation may have reduced the ability of these variables to differentiate among respondents; however, because this explanation was not directly examined through additional variance or subgroup analyses, it remains tentative. Therefore, the lack of statistical significance should not be interpreted as indicating that the perceived effects of forest recreation are unimportant. Within the models used in this study, awareness, satisfaction, and ecological sensitivity were significantly associated with WTP, whereas the perceived-effect variables were not. Future research should employ more context-specific and discriminating measures and examine whether these relationships differ across respondent groups.

4.3. Sensitivity Analysis by Protest Response Treatment

To confirm the sensitivity of results to the treatment of protest responses, this study conducted a parallel analysis excluding protest respondents. In CVM, protest responses arise from objections to the payment vehicle or the policy implementation rather than reflecting a genuine zero value for the valuation object itself. The treatment of these responses affects estimates and their interpretation [43,50].

In the sensitivity analysis excluding protest respondents, the mean WTP based on Model 3 was estimated at KRW 21,483, higher than KRW 17,418 from the main analysis. The non-overlapping confidence intervals indicate that the estimated WTP was sensitive to the treatment of protest responses. The full-sample estimate retained all responses, including payment refusals that may have reflected objections to the payment vehicle or policy implementation, whereas the sensitivity-analysis estimate excluded responses classified as protests according to the predefined criteria. Accordingly, the two estimates should be interpreted as alternative results under different treatments of protest responses rather than regarding either estimate as a definitive value of the forest recreation function.

Regarding determinants, household income, awareness of forest recreation, experience of forest recreation, and satisfaction with rest and leisure in forests were identified as statistically significant determinants of WTP, with positive coefficients. Compared to the main analysis, experience of forest recreation emerged as a new determinant, while forest ecological sensitivity did not achieve statistical significance.

To understand why experience of forest recreation was significant only in the sensitivity analysis, we examined the usage experiences of protest respondents. Among 310 respondents with experience of use, 52 (16.8%) were protest respondents who had used forest recreation but refused payment due to objections. Consequently, the payment acceptance rate among respondents with use experience was only 63.5% in the full sample but increased to 76.4% when excluding protest respondents. Thus, this descriptive pattern may partly explain why use experience became significant in the analysis excluding protest respondents. However, its association with WTP should be interpreted as sensitive to the treatment of protest responses because it was not significant in the full-sample model.

Similarly, to explore why forest ecological sensitivity was not significant in the sensitivity analysis, we reviewed the ecological sensitivity levels of protest respondents. The mean ecological sensitivity of protest respondents was 3.46, lower than the full-sample mean of 3.68. Because protest respondents exhibited lower ecological sensitivity and rejected both bids, their inclusion may have strengthened the positive association between ecological sensitivity and WTP in the full-sample model. After these respondents were excluded, the coefficient decreased from 0.509 to 0.316 and was no longer statistically significant. This descriptive pattern may partly explain the change in statistical significance; however, the association between ecological sensitivity and WTP should be interpreted as sensitive to the treatment of protest responses.

5. Conclusions

This study analyzed the public's WTP for the forest recreation function and its determinants by applying the DBDC CVM to 1050 adults nationwide.

The analysis estimated mean stated WTP for the forest recreation function at KRW 17,418 (approximately USD 12.3), with household income, awareness of forest recreation, satisfaction with rest and leisure in forests, and forest ecological sensitivity identified as significant determinants of WTP. By contrast, none of the perceived-effect variables were identified as significant determinants of WTP. In the sensitivity analysis excluding protest respondents, mean stated WTP was estimated to be higher at KRW 21,483 (approximately USD 15.1), with experience of forest recreation emerging as an additional significant factor.

The following conclusions can be drawn from these results.

First, under the hypothetical per-visit payment scenario, stated WTP for the forest recreation function was not confined to respondents with use experience. Mean WTP was KRW 15,043 (approximately USD 10.6) among respondents without use experience and KRW 25,402 (approximately USD 17.9) among those with use experience. Because these subgroup estimates were unadjusted, the difference should not be interpreted as an independent effect of use experience. The awareness rate for forest recreation (82.9%) exceeded the use experience rate (29.5%), and awareness was significantly associated with higher WTP. Given this substantial gap, policy efforts could focus on improving accessibility and providing practical service information to connect the high level of awareness with opportunities for actual use.

Second, none of the six perceived-effect variables were significantly associated with WTP, although responses were concentrated in neutral-to-positive categories. Thus, these variables did not explain statistically significant variation in WTP in the models used in this study. This finding does not indicate that the perceived effects of forest recreation are unimportant; rather, it suggests that general perceptions of these effects alone may be insufficient to explain individual differences in stated WTP. Future valuation studies should employ more context-specific and discriminating measures and examine heterogeneity across respondent groups.

Third, the estimated WTP for the forest recreation function varies based on the treatment of protest responses. Mean stated WTP was KRW 17,418 (approximately USD 12.3) in the full sample and KRW 21,483 (approximately USD 15.1) when protest respondents were excluded. Accordingly, neither figure should be interpreted as a definitive population value; both should be interpreted within the context of the specified hypothetical per-visit payment scenario and the applied treatment of protest responses.

Fourth, this study extended the valuation focus from specific sites to the forest recreation function itself. Unlike prior studies estimating the value of specific sites among visitors, this study provides empirical evidence based on a nationwide sample that included respondents without prior use experience.

These results can contribute to broadening the empirical basis for assessing the public-benefit functions of forests and may inform service design and policy development that consider respondent characteristics and satisfaction.

This study has the following limitations.

First, it used a CVM based on a hypothetical market scenario to measure WTP rather than actual payment behavior. Consequently, as reported for stated-preference approaches, WTP may have been overestimated relative to actual payments [51–53]. In addition, the valuation object—the forest recreation function—broadly encompassed recreation facilities, programs, and the maintenance and conservation of the forest environment. Because the per-visit fee was not linked to a specific site or service, respondents may have emphasized different components when interpreting the hypothetical scenario. The survey did not include a certainty scale, cheap-talk script, or scope test, limiting the direct assessment of potential hypothetical bias. Second, identifying protest responses based on the first-ranked reason and predefined refusal categories represents one operational definition of protest behavior; alternative classification criteria could yield different WTP estimates. Third, because the study relied on a self-report questionnaire, response bias may have affected the variables of awareness, satisfaction, and attitude. Fourth, analyzing cross-sectional data at a single point in time limits the interpretation of the relationship between the determinants and WTP as causal.

Future research should extend these results by comparing them with actual payment behavior, examining differences across payment vehicles and valuation methods, analyzing by demand group, and considering the specific attributes of forests and spatial factors.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/f17080991/s1>, Table S1: Comparison of the sample and resident-registration population distributions by sex, age, and place of residence, September 2025; Table S2: Robustness comparison of DBDC Model 3 estimates under the Logit and Probit specifications.

Author Contributions: S.P. (Sooil Park): conceptualization, methodology, formal analysis, software, data curation, writing—original draft, writing—review and editing, and visualization. Y.L.: supervision, project administration, funding acquisition, methodology, validation, and writing—review and editing. S.P. (Sujin Park): methodology, resources, and writing—review and editing. J.K.: methodology, resources, and writing—review and editing. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the National Institute of Forest Science under Grant No. FM0600-2025-01-2025.

Institutional Review Board Statement: This study involved an anonymous, minimal-risk questionnaire survey. Participation was voluntary, and no personally identifiable or sensitive information was collected.

Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

WTP	Willingness to pay
CVM	Contingent valuation method
DBDC	Double-bounded dichotomous choice
MLE	Maximum likelihood estimation
KRW	Korean Won
USD	United States Dollar

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