sustainability

MDPI

Article

Valuing the Recreational Services Provided by Hungary's Forest Ecosystems

Anna Széchy * and Zsuzsanna Szerényi

Institute of Sustainable Development, Corvinus University of Budapest, 1093 Budapest, Hungary
* Correspondence: anna.szechy@uni-corvinus.hu

Abstract: The aim of this paper is to assess the economic value of recreation as an ecosystem service enjoyed by hikers in Hungary's forests. The assessment is carried out in the framework of a national undertaking to map and assess the state of ecosystems and their services in Hungary under the EU's biodiversity strategy. As is common in the policymaking context, the constraints of the project did not allow for a primary study. We therefore rely on previous studies and combine several approaches to arrive at a value estimate on two scales. First, we conduct a local case study, calculating travel costs for the Pilis Biosphere Reserve, a popular hiking area where visitor surveys are available. We then estimate the unit (value per visit) and total value of forest recreation for the whole country by a different approach, based on foreign studies via benefit transfer. We find that the results from the two approaches are consistent and that the monetary value of forest recreation (in the form of hiking/walking) is approximately 10 million EUR/year for the Pilis Biosphere Reserve and approximately 100 million EUR/year for the whole country.

Keywords: benefit transfer; ecosystem services; forest recreation; monetary valuation; travel costs

check for updates

Citation: Széchy, A.; Szerényi, Z. Valuing the Recreational Services Provided by Hungary's Forest Ecosystems. *Sustainability* **2023**, *15*, 3924. https://doi.org/10.3390/su15053924

Academic Editor: Pablo Peri

Received: 26 December 2022
Revised: 7 February 2023
Accepted: 15 February 2023
Published: 21 February 2023

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

1. Introduction

Many economists and conservationists have embraced the concept of ecosystem services and their monetary valuation as a tool to better integrate environmental considerations into decision making (e.g., [1–3]). It is argued that the benefits provided by nature to society are often taken for granted and thus neglected in favour of aspects that have clear financial consequences. Assigning monetary values to natural capital and ecosystem services may therefore lead to decisions that are better for the environment as well as for society as a whole [4]. Although the monetary valuation of ecosystem services is fraught with numerous theoretical and practical caveats that lead many to call into question the usefulness of such methods (see for example [5,6]), most international organizations, such as the World Bank, the Organisation for Economic Co-operation and Development (OECD), and the European Union (EU), are pushing for their development and integration into policymaking processes (see for example [7–9]).

The EU's Biodiversity strategy for 2020 [10] explicitly calls for Member States to assess the state of ecosystems and their services in their national territory (a project known as MAES, for the Mapping and Assessment of Ecosystems and their Services). This also includes economic valuation, which, however, is only carried out for selected ecosystem services. To implement the assessment in Hungary, expert groups were formed to cover the most important ecosystem services, one of which was dedicated to cultural ecosystem services, particularly recreation and cultural heritage. The expert group carried out the assessment and mapping of the country's entire area with regard to its potential for nature-based recreation, particularly hiking/walking, which is the dominant nature-based recreation activity in Hungary. The recreation potential was evaluated based on factors such as land cover, topography, biodiversity, and "naturalness", as well as the presence of specific attractions (such as caves, lookout points, etc.) and accessibility (roads, public

transport). The assessment showed that forests (particularly natural forests composed of indigenous tree species such as beech and oak) have the highest recreation potential for hikers [11]. Therefore, it was decided to focus the monetary valuation of recreation on forest ecosystems. In Hungary, several ecosystem valuation studies have been carried out in the past (see [12]), but none have addressed recreation. As participants in the MAES-HU project, the authors of this paper carried out the valuation exercise (see the Funding section at the end of the paper for the project details and Vári et al. [13] for an overview of the project's overall results).

Forests are typically areas with high biodiversity and provide a wide range of ecosystem services including recreation and are generally considered one of the most attractive types of landscape for this purpose [14]. Forest ecosystems are defined by the Technical Expert Group to the Convention on Biological Diversity as "a dynamic complex of plant, animal and microorganism communities, and their abiotic environment, interacting as a functional unit, where the presence of trees is essential." ([15], p. 7). The importance of recreation among the ecosystem services provided by forests emerges as particularly high in a European context (while in developing countries, provisioning services are perceived to be the most important) [16]. Recently, the COVID-19 pandemic and the restrictions accompanying it appear to have increased the importance of forest recreation even more. With other recreation opportunities limited, more people have turned to outdoor recreation and forests as a way to spend free time, keep fit, and reduce stress experienced during the pandemic, leading to a marked increase in forest visits (see [17] for Germany, and [18] for Slovakia). It remains of course to be seen whether these changes endure beyond the pandemic, but it is not unreasonable to assume that if groups of people who have not hitherto engaged in forest-based recreation tried these activities during the pandemic, at least some of them may develop new habits and preferences that persist into the future. All this again points to the need to view forests, among their many other functions, as important sites for recreation and to integrate the value of this ecosystem service into forest management decisions.

The most common method for estimating the economic value of recreation as an ecosystem service is the travel cost method, but there are also many studies relying on stated preference methods such as contingent valuation or choice experiment. The travel cost method values the recreational services provided by ecosystems based on the expenditure and time people are willing to invest in order to enjoy them. This method has been widely used to estimate the recreational benefits provided by forests of all kinds, including urban forests ([19] in Berlin, Germany; [20] in Melaka, Malaysia), national parks ([21] in Chile; [22] in Germany; [23] in China), as well as nationwide studies, including all types of forests (e.g., [24] in Switzerland). Other nationwide studies focus on outdoor or nature-based recreation in general (e.g., [25] in Sweden and [26] in Finland), showing that forested areas are the greatest source of the recreation benefit in these countries. Another key lesson from these studies is that accessibility is a key issue for the recreation value, with forested areas located in close proximity to population centers providing the greatest overall benefit due to the high number of visits (while the value of individual visits may be greater for more distant destinations). A meta-analysis of 26 European studies valuing forest recreation using the travel cost method is presented by Zandersen and Tol [27].

While the travel cost method relies on the observation of actual consumer behaviour, stated preference methods elicit individuals' willingness to pay for ecosystem services through surveys, the hypothetical nature of which may result in less reliable values ([12,28]). Studies using contingent valuation to estimate the recreational value of forests include, e.g., [29] in Ireland, [30] in Germany, and [31] in Taiwan. Barrio and Loureiro [32] conducted a meta-analysis of contingent valuation studies on the ecosystem services provided by forests and found recreation opportunities to be an important driver of people's willingness to pay for forest management programmes.

Comparing the travel cost method and stated preference methods in relation to outdoor recreation, a meta-analysis by Sen et al. [33] found that studies applying the travel cost method tend to yield higher value estimates than stated preference methods. Applying both methods to Polish forests, Bartczak et al. [34] found the same relationship and explained it by the observation that proposing a scenario where people would have to pay for a service previously enjoyed free of charge (forest access) may lead to strong resentment among respondents. This manifests itself not only in a high share of so-called protest zeros, which researchers typically exclude from the results, but may also lead to reduced values for the remaining responses. This means that in case of forest recreation, results based on the travel cost method can be considered more reliable than stated preference studies.

Hedonic pricing can also be used to capture the value of recreation by examining the impact of the proximity to natural areas on property prices, but it is difficult to distinguish the value of recreation opportunities from other environmental characteristics, such as improved air quality. This method has mainly been used in the valuation of urban green spaces, such as parks, e.g., [35] for Leipzig, Germany, or [36] for Budapest, Hungary. Theoretically it is also possible to use cost-based approaches, specifically avoided costs. Here, it can be assumed that time spent in nature has a positive impact on people's health, thereby reducing healthcare expenditure and economic losses resulting from premature death or disability [37]. However, this method is more suitable for the estimation of the overall importance of sports and outdoor recreation for the national economy rather than the valuation of specific ecosystems and recreation activities.

The aim of this paper is to examine the value of the recreation service provided by Hungary's forests. The valuation is carried out on two scales: for a specific study area and on the national level. The specific activity chosen for valuation was hiking/walking, as this is the most significant forest recreation activity in Hungary, with recent surveys on outdoor recreation indicating that 48.7% of the country's active-aged population engage in it at least occasionally [38]. Unfortunately, the constraints of the MAES-HU project did not allow carrying out a primary study. In the policy context, it is a common problem that due to limited resources and time, valuation exercises have to be attempted without being able to rely on primary data [28]. Nevertheless, as argued by Jadhav et al. [39], even in such situations, providing a monetary estimate for the value of ecosystem services can be a powerful tool to make their benefits visible to decision makers.

In cases where carrying out a primary study is not feasible, it has become common practice to adapt values from previous studies to new sites and situations, in a process known as value transfer or benefit transfer [40]. The sources for these estimates may be individual studies conducted at similar sites or meta-analyses of several primary studies [41]. In either case, great care must be taken in selecting the source studies and in adjusting the values to account for differences between the source and the target context ([28,42]). Shrestha et al. [43] argue that value transfers made based on meta-analyses rather than single studies lead to better results, however, they emphasize that in any case, the informed choices of the researchers conducting the transfer remain crucial to the process. The main advantage of using meta-analyses for benefit transfer is that they are based on large amounts of data from multiple previous studies. However, some time and location specific details may be lost during the aggregation process, which means that this approach is best suited for use on the national level ([44–46]). The meta-analysis-based benefit transfer approach was applied with regard to recreation, e.g., in the UK National Ecosystem Assessment [33].

Our study is the first attempt to capture the economic value of forest recreation (or any type of recreation) as an ecosystem service in Hungary. First, we examine a specific area, the Pilis Biosphere Reserve. This site was chosen for two reasons. Firstly, it is one of the most popular destinations for hikers in Hungary [38]. Secondly, this is the area where the largest amount of data is available in the form of previous visitor surveys that allow us to derive a value estimate based on travel costs. Then, we estimate the recreation value for the country's forests as a whole. Here, we used a different approach (as the Pilis Biosphere

reserve cannot be considered representative for all the country's forests). We apply the benefit transfer method, adapting per visit values from suitable foreign studies. The simultaneous examination of the local and national level represents a novel approach, as most previous studies have either focused on a single site (for example [19–21,23,47,48]) or an entire country (for example [24–26,49]). The comparison of the results for the two scales, which were assessed independently (the national values were not obtained by scaling up the local results), allows us to evaluate the consistency of the methods and have more confidence in the reliability of the findings.

Our research questions were therefore the following:

- What is the value of recreation as an ecosystem service for hikers in the Pilis Biosphere Reserve?
- What is the value of recreation as an ecosystem service for hikers in Hungary's forests as a whole?
- Are the value estimates derived on the two different scales, using different approaches, consistent?

We find that the economic value of the recreation ecosystem service provided to hikers is approximately 10 million EUR/year for the Pilis biosphere Reserve and approximately 100 million EUR/year for the whole country (for the year 2020).

2. Materials and Methods

2.1. Study Areas

Forests in Hungary cover just under 2 million hectares (remaining largely unchanged over the past decade), which is 20.9% of the country's surface area (see Figure 1). Moreover, 59.5% of the country's forests primarily serve commercial purposes (wood production), while the rest are designated for "special purposes", such as nature protection, soil or water protection, but also education, border zones, etc [50]. In terms of ownership, 56% of forests are owned by the state and 42% are in private hands (the remaining 2% are under community ownership) [51]. It should be noted that, as a main rule, Hungarian laws allow visitors access to forests for purposes such as hiking regardless of ownership. The dominant species in Hungarian forests are oaks (32.3%), robinia (black locust; 24.5%), poplars (10.6%), pines (9.6%), and beech (6.1%) [52].

The Pilis Biosphere Reserve (PBR) is one of six biosphere reserves in Hungary (added to UNESCO's network in 1980). It is an area of low mountains (with the highest peaks reaching just over 700 m) covered mainly by oak and beech forests, located about 30 km North of the capital Budapest. The total area of the PBR is 38,600 hectares, with its strictly protected core zone of 1400 hectares and buffer zone of 24,000 hectares consisting entirely of state-owned forests, while the so-called transition zone of 13.4 hectares also comprises settlements and agricultural areas (see Figure 2) [53]. The PBR offers beautiful views on the scenic Danube Bend and is home to a wide variety of plants and animals, including several protected species. Its proximity to the capital and many well-kept hiking trails make it one of the most popular destinations for hikers in Hungary [54].

2.2. Estimating the Value of Hiking in the Pilis Biosphere Reserve

First, we estimated the value of hiking for the Pilis Biosphere Reserve. A survey was conducted in the area during 2017–2018, aiming to assess the number and characteristics of hikers visiting the PBR [55]. Although not originally intended for that purpose, the survey nevertheless provides enough data to calculate an estimate for the economic value of recreation based on travel costs. The questionnaire was completed via in-person interviews, conducted on site, by 1194 respondents (Data collection took place at numerous locations across the PBR that serve as typical starting points for hikers during a weekend in October in 2017 and a weekend in October 2018. All hikers encountered by the researchers were asked to take part in the survey [55]). Information elicited included the duration of the visit (half day, whole day or more than one day), the starting point of the hike, the domicile (municipality) of the visitor, and the number of people hiking together as a group. Thus,

this survey provides enough data for us to estimate the average cost per visit, although we had to rely on different assumptions and estimates in some places where exact information was not available. To obtain the total recreational value, we also had to estimate the annual number of visits to the area. This could be done based on the data from the above survey and additional information from the forest authority managing the area.

A full application of the travel cost method would have necessitated more detailed data, including the frequency of visits by each person to estimate a demand curve and calculate consumer surplus (see for example [56,57]), which was unfortunately not available in our case. Therefore, similarly to Lupp et al. [48] and Lin et al. [49], we performed the valuation solely based on the number of visits and the average cost per visit.

One key question regarding travel costs is whether time spent at the site should be included in the cost of visits, and if yes, at what value (including it obviously results in higher estimates for the recreational value) [27]. We are of the opinion that including the time spent travelling as well as at the site is justified, since the recreational value of hiking is well reflected by the fact that people decide to spend a certain portion of their free time (which is just as limited as their financial resources) on this rather than any other activity. Moreover, excluding the time spent at the site from the travel cost calculations would mean that people living in close proximity to a forest (for whom getting there involves no actual out-of-pocket expenditure) do not derive any recreational value from visiting it, which is clearly not realistic.

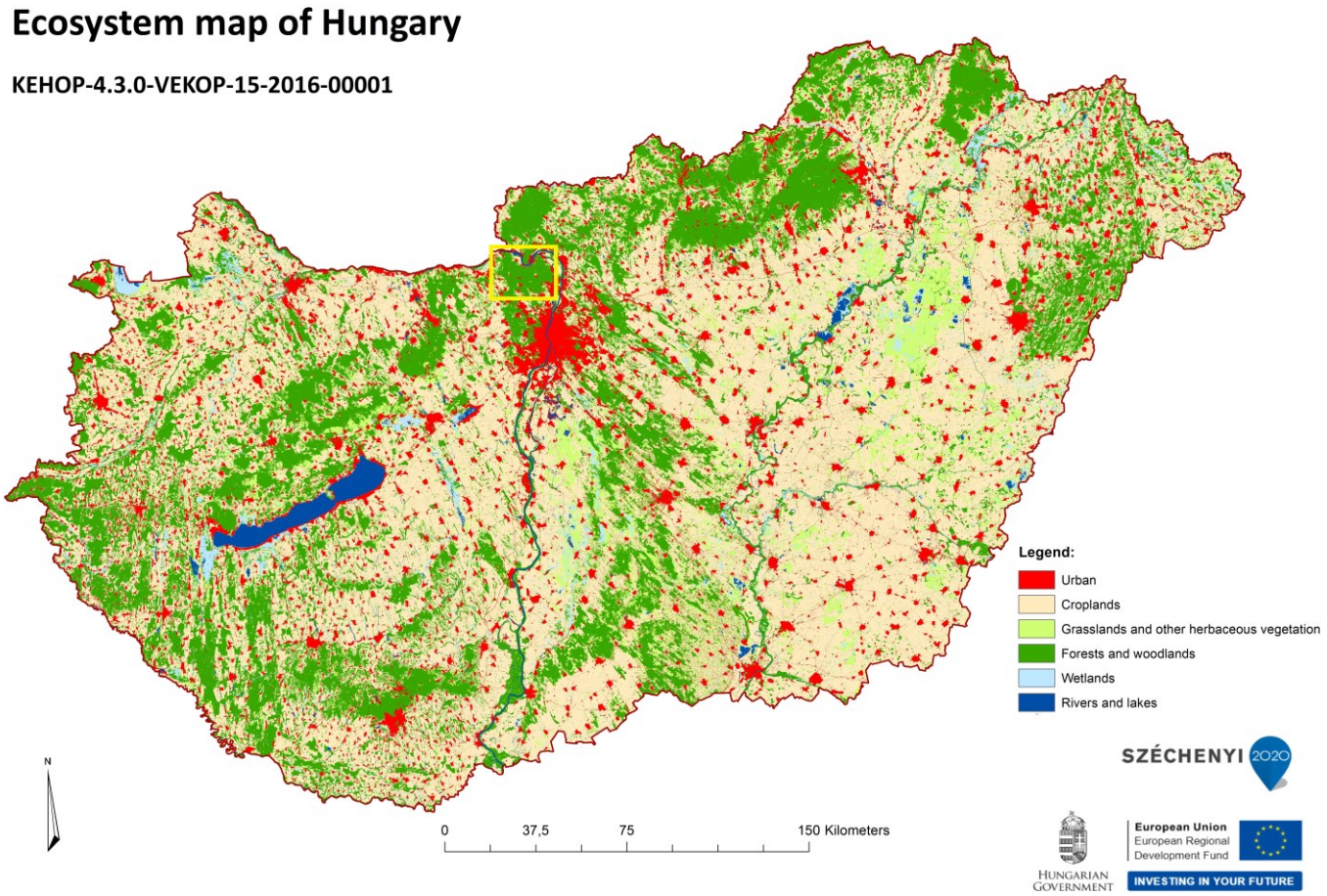

Figure 1. Map of Hungary's ecosystems (the yellow rectangle shows the location of the PBR) (the map was created in the framework of the MAES-HU project by the Lechner Knowledge Center, the Ministry of Agriculture, the Centre for Ecological Research and the Institute for Soil Sciences).

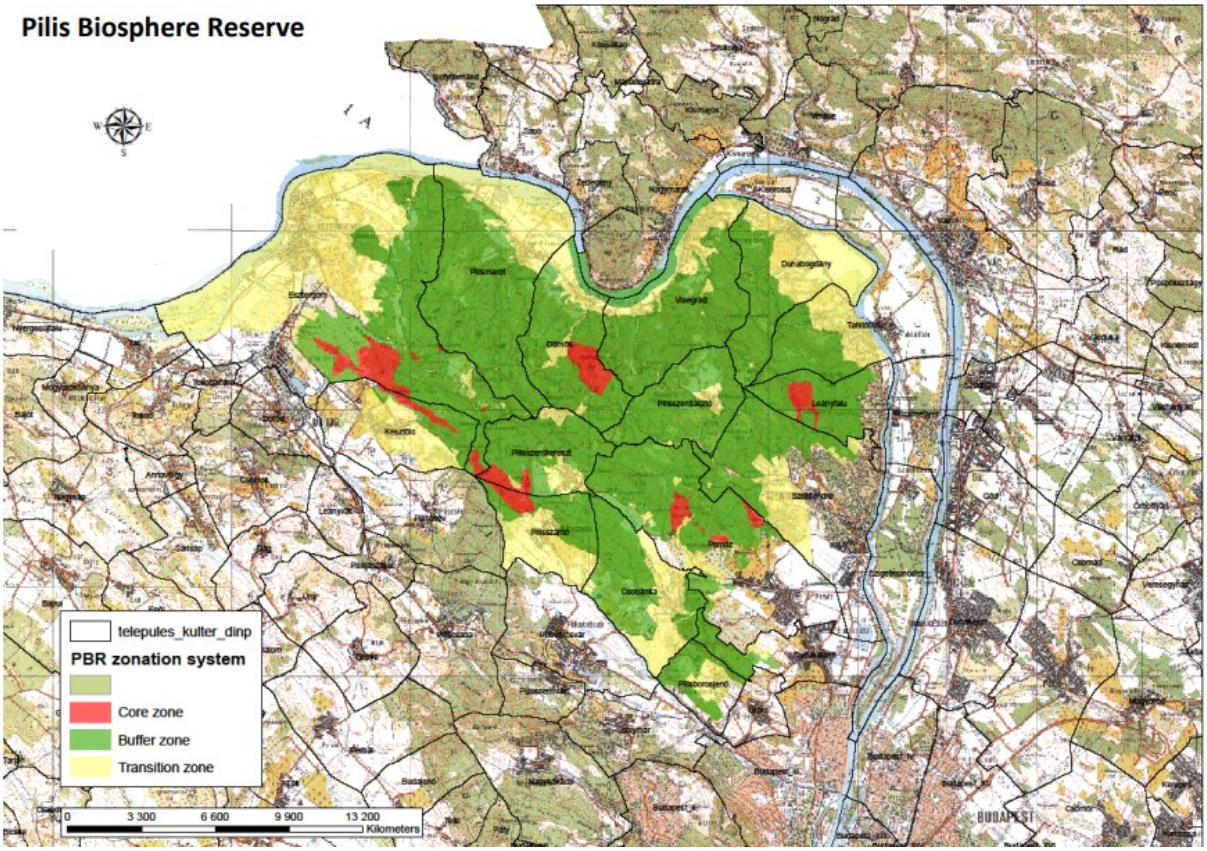

Figure 2. Map of the Pilis Biosphere reserve (the map was provided directly by Pilisi Parkerdő Zrt.).

The value of a trip is thus comprised of two elements: direct travel expenditure and the opportunity cost of time spent on the visit ([24,47,57]). Regarding the direct travel expenditure, it was assumed that all visitors used a car to access the site (which is typical in case of the Pilis area) and the distance travelled was taken as the distance between the visitors' domicile and the starting point of the hike using Google Maps. The average distance travelled was 40.2 km for half-day visitors (58.5% of respondents) and 53.5 km for full day visitors (30.5% of respondents) [55]. We assumed that the number of people traveling in the same car was 2.5 on average. This is unfortunately not certain, since the original survey only indicates that 10% of respondents were hiking alone; 39% in groups of 2, 37% in groups of 3–5, and 14% in larger groups, but we do not know the exact group sizes and the likelihood that people hiking together did not travel to the site in the same car of course increases with the group size.) We then estimated the travel expenditure assuming a gasoline cost of HUF 366/l (the average during 2017–2018, the time of the survey, based on official data from the National Tax and Customs Administration) [58] and an average fuel consumption of 8 l/100 km (which is reflective of the relatively high average age of cars in Hungary—14.2 years at the time of the survey according to the Hungarian Central Statistical Office) [59].

Regarding the opportunity cost of time spent on the visit, the most common recommendation from the literature is to include it at 25–50% of the individual's wage [60]. We opted for a relatively prudent rate of 30% (similarly to [24]) and, because we did not have data on respondents' actual income, used the average net hourly wage, which was HUF 1231 in 2018 [61]. Some uncertainty results from the fact that the time spent in the PBR by each visitor was only recorded in a categorical form (half a day, full day, more than one day), so we had to rely on educated guesses to translate this into hours. We assumed that half a day means 4, and a full day 8 h, which already includes the time spent travelling to and from the site. Multi-day visits, however, which comprised 11% of respondents, were treated as single, full day visits for the purposes of the calculation, because we could not be

sure that each day of such trips was spent hiking in the forest, and not on other activities in the area, such as visiting cultural sights, baths, etc. From this aspect, our values can therefore be regarded as prudent estimates.

The value per visit in the Pilis Biosphere reserve was thus calculated (separately for half-day and full day visits) as

$$\textit{Average value per visit} = \textit{cost of travel} + \textit{opportunity cost of time spent on the visit} \quad (1)$$

where

$$\textit{cost of travel} = \textit{average distance travelled (km)} \times \textit{gasoline consumption (litres/km)} \times \textit{cost of gasoline (HUF/l)} / \textit{number of people travelling in the same car} \quad (2)$$

and

$$\textit{opportunity cost of time} = \textit{time spent on the visit (hours)} \times 0.3 \times \textit{average net hourly income (HUF)} \quad (3)$$

The total annual recreation value was calculated from the average values via the total number of visits as:

$$\textit{Total annual value of hiking in the Pilis Biosphere Reserve} = \textit{number of half-day visitors per year} \times \textit{average value of half-day visits} + \textit{number of full day visitors per year} \times \textit{average value of full day visits} \quad (4)$$

The management authority of the PBR uses several methods to estimate the annual number of visitors to the area. Manual visitor counts covering the entire area are undertaken each year (on a weekend in September or October), and a permanent visitor counting device is placed at one of the most frequented lookout-towers (Prédikálószék). The manual counts show the number of visitors ranging between 10,000 and 17,000 per weekend (dependent above all on the weather), while the permanent counter at the Prédikálószék lookout tower shows that approximately two-thirds of visitors arrive at weekends and one third on weekdays [62]. Aiming to avoid outliers, we used a lower estimate of 12,000 visitors per weekend and a higher estimate of 15,000 visitors per weekend, which translates to 936,000 and 1,170,000 visits per year, respectively (assuming the proportion of weekend-to-weekday visits is the same for the whole area as shown by the Prédikálószék visitor counter). This translates to 547,560 half-day and 388,440 full-day visits in the lower, and 684,450 half-day and 458,550 full-day visits in the higher estimate (using the proportions found by Benkhard and Csákvári [55]).

2.3. Estimating the Value of Hiking for all of Hungary's Forests via Benefit Transfer

Recreation values are highly site-specific, being influenced by a number of characteristics, such as accessibility (proximity to densely populated areas, availability of hiking trails) and attractiveness (natural beauty, wildlife, amenities, etc.), that influence not only the number of visits to a given area, but also the value per visit [63]. This means that the results of the Pilis survey could not be adapted to provide an estimate for the value of the recreational service provided by the country's forests as a whole.

The value of forest recreation for the entire country was estimated using the benefit transfer method, by adapting the average value per visit (or per person) from comparable foreign studies and estimating the total number of recreational visits to Hungary's forests. For the benefit transfer, we sought to identify studies in the literature whose setting was as similar as possible to ours. Namely, we looked for studies providing average value estimates for a broad range of forest sites. Some of these are meta-analyses, which, as explained above, are well suited for value transfers on the national level. We limited our focus to Europe and excluded studies focusing on highly specific recreation activities, such as hunting, riding, or fishing (as these tend to have much higher value estimates than walking or hiking, which was the focus of our study). We also excluded studies focusing

on higher mountain ranges (of which Hungary has none), as the experience for hikers in this case might be quite different and the recreational value higher.

In the end, we identified four studies suitable for the benefit transfer process and used these to calculate a range of estimates.

- The 2014 work of Sen et al. [33] is a study published in the framework of the UK's National Ecosystem Assessment. The economic valuation of recreation relies on a meta-analysis of recreational values from over 200 previous studies (using the travel cost method or stated preference methods). The study provides estimates for the value per visit for a range of ecosystems, including forests, for which the average estimate is 3.34 GBP (in 2010 GBP). The estimate only includes single day trips with no specific purpose, such as hunting, kayaking, etc.
- Zandersen and Tol [27] conducted a meta-analysis of 26 studies featuring 251 estimates for the recreational value or forests via the travel cost method. The average value per visit was 17.3 EUR while the median was only 4.52 EUR (in 2000 EUR), indicating that the average value was skewed by a small number of very high estimates (we therefore decided to use the median value in the benefit transfer process).
- Bartczak et al. [34] conducted surveys across ten different forest areas in Poland using the travel cost method to estimate the average value per visit which was 6.93 EUR (in 2005 EUR).
- Elsasser and Weller [30] provide an estimate for the value of forest recreation in Germany via a national representative study based on the contingent valuation method. This is different from the previous studies in that, instead of an average value per trip, they calculate the average per person willingness to pay for visiting the country's forests over a whole year, which was 27 EUR overall and 32 EUR for forest users (in 2011 EUR).

The results from the above studies were converted to 2020 values by adjusting for inflation and adapted to Hungary by correcting for differences in income. The latter adjustment is necessary because the values in the original studies were all obtained via either the travel cost method or contingent valuation, both of which reflect consumer decisions and are thus influenced by respondents' income. Transferring the results from studies carried out in countries with higher average income than Hungary without adjustment would therefore lead to an overestimation of the recreation values.

A further factor that might potentially distort the results is if differences exist in people's preferences toward hiking and forest recreation between Hungary and the countries in the original studies. A higher preference for hiking as a recreational activity among the population of a certain country might namely result not only in a higher number of forest visits but also in higher values per visit. As the values of Sen et al. [33] and Zandersen and Tol [27] are based on meta-analyses of studies from various countries, it is unfortunately not possible to conduct a direct comparison of preferences, but in the case of Poland and Germany, we know that hiking is a much more important part of the average person's lifestyle than in Hungary. In Poland, 85% of the adult population has visited a forest at least once over a period of one year [34]. In Germany, this proportion was 76.4% [30], while in Hungary, only 48.7% of the country's active population engages in hiking at least occasionally [38].

First, we created a value estimate using the average per visit values from the first three studies. In their meta-analysis, Sen et al. [33] state that the all the model specifications were set to provide conservative estimates. Therefore, we decided to adopt the value from this study as the lower and the value from Zandersen and Tol [27] as the central estimate for our calculations. Given the differences between preferences, it is clear that directly adapting the Polish value would not be appropriate for Hungary even as an upper estimate. Therefore, in order to provide a sensitivity analysis (and to account for the possibility that hiking may be more popular in Hungary than the original settings of the studies in Zandersen and Tol [27]), we decided to include a symmetrical upper estimate for the per visit value.

In order to calculate the total recreational value of Hungary's forests from the average per visit values, we also need to know the number of recreational visits made over one year. Unfortunately, there is no reliable statistical data regarding the annual number of recreational visits to Hungary's forests, so we also had to rely on estimates for this element of the calculation. The outdoor recreation survey mentioned above [38] was representative for the country's active age population, but only collected data regarding the frequency of hiking in categorical terms ("regularly", "occasionally") rather than the exact number of visits. Nevertheless, we can use it to obtain a rough estimate. Assuming for example that "regularly" (17.2% of respondents) means on average once per month and "occasionally" (31.5% of respondents) means twice per year, we arrive at an annual number of visits of 16.8 million, while assuming higher numbers (two visits a month for regular and three visits per year for occasional hikers) the annual number of visits is 31.7 million. Both estimates, however, are too low in the sense that they are only for the active age population, while younger and older groups also engage in hiking/walking in the forest and enjoy the recreational benefits it provides.

The other source of information is the management authority in charge of the forests in and around Budapest (including the Pilis Biosphere Reserve as well as other hills and forests even closer to, or within the city itself which the residents of the capital use for daily recreation). Based on regular visitor counts, they estimate that the annual number of visits to their area is around 18.5 million (this figure only includes hikers, not bikers, joggers, etc. so directly corresponds to our focus) [62]. Unfortunately, we do not have similar information for the rest of the country, but if we assume that people living in the rest of the country visit the forests in their area about as frequently as the residents of the Budapest agglomeration (which is home to 1/4 of Hungary's population) visit the forests within and near to the city, the total number of forest visits in the whole country would be 74 million. Of course, the visitor numbers in the forests close to Budapest also include visitors from other parts of the country, but similarly, the residents of Budapest might also travel elsewhere for hiking, so this effect might be balanced out. However, if we based the estimate for the whole country on the hiking habits of the residents of the Budapest agglomeration, we would be certain to overestimate the actual number of visits. This is because the recreational survey shows that in Hungary, people with higher educational attainment and income (which is true for Budapest compared to the country average), and urban residents in general, have a higher-than-average preference for hiking as a recreational activity [38].

In light of the above, we believe that the actual number of recreational visits to Hungary's forests might realistically be somewhere between the two estimates seen above, i.e., approximately 40–50 million per year.

The total value of recreation (hiking) in Hungary's forests was thus calculated as follows [33]:

$$\textit{Total annual value of forest recreation} = \textit{average value per visit} \times \textit{annual number of visits} \quad (5)$$

We also calculated an estimate for the value of forest recreation for the whole country transferring values from the study of Elsasser & Weller [30]. Because this study uses the contingent valuation method and reports per person per year values (instead of per visit values), it requires a slightly different approach. To make sure that the much higher proportion of hikers in Germany versus Hungary did not distort the results, we opted for transferring the average value for forest users (32 EUR) and extrapolate this only for the corresponding population in Hungary:

$$\textit{Total annual value of forest recreation} = \textit{average annual willingness to pay of forest users} \times \textit{number of forest users in the country} \quad (6)$$

3. Results and Discussion

3.1. The Value of Hiking in the Pilis Biosphere Reserve

Our calculations were carried out as shown in Equations (1)–(4). The results are shown in Table 1 (all values have been converted to EUR and updated for 2020 by correcting for inflation). The average value per visit is 7.56 EUR for half-day and 13.15 EUR for full day trips. Using these estimates, we obtain an annual recreation value for hiking at the Pilis Biosphere Reserve of 9.3–11.6 million EUR for 2020 (using the lower and the higher estimates for the number of visits, respectively).

Table 1. Value of the recreation ecosystem service enjoyed by hikers at the Pilis Biosphere Reserve (in 2020 EUR).

	Value Per Visit (EUR)			Number of Visits Per Year (Thousands)		Total Annual Recreation Value (Million EUR)	
	Travel Expenditure	Cost of Time	Total Cost	Lower Estimate	Higher Estimate	Lower Estimate	Higher Estimate
Half-day trips	2.95	4.62	7.56	547.56	684.45	4.14	5.17
Full day trips	3.92	9.23	13.15	388.44	485.55	5.11	6.38
Total				936	1170	9.25	11.56

3.2. The Value of Hiking for All of Hungary's Forests

The values per visit adapted to Hungary from the studies identified for benefit transfer in Section 2.3 (corrected for inflation and income differences, expressed in 2020 EUR) were as follows: (For the conversion, it was necessary to decide whether to perform the inflation adjustment first and then the adjustment for income, or vice versa. Due to the fact that the gap between Hungarian and Western-European incomes has narrowed between the years of the original studies and 2020, we believe that basing the income correction on 2020 income proportions provides a more realistic picture of 2020 recreation values for Hungary. Therefore, we accounted for inflation first and then adjusted the values to Hungary. The calculations were based on inflation and net per capita average annual disposable income figures on PPP basis (as provided by Eurostat) for the countries in the original studies and Hungary (in case of the value from the meta-analysis by Zandersen & Tol [27], the EU average inflation and income values were used).) the lower estimate based on the UK values of Sen et al. [33] was 1.3 EUR, the central estimate based on the meta-analysis of Zandersen and Tol [27] was 2.26 EUR, and our upper estimate was 3.22 EUR (as explained above, we opted for a symmetrical value instead of adapting the Polish values which are certain to be unrealistically high for Hungary). It is worth noting that these values are considerably lower than the value per visit estimates calculated for the Pilis Biosphere Reserve (see Table 1). However, this could be expected given the fact that most forest visits are short walks undertaken in close proximity to people's homes, and therefore the "average" visit would have a significantly lower individual value than the somewhat longer trips typical for the Pilis area.

Based on the estimates for the average value per visit and the total number of visits (Equation (5)), we created a range of estimates for the total annual value of forest recreation (with respect to hiking/walking) in Hungary, which can be seen in Table 2. The values range between 52.4 and 161 million Euros with a central estimate of 101.7 million EUR/year.

We also calculated a different estimate, transferring per person willingness to pay from the study of Elsasser & Weller [30] (see Equation (6)). The average willingness to pay of forest users (32 EUR in the original study) corresponds to 8.3 EUR in Hungary, after adjusting for inflation and income differences. Extending this to the 48.7% of the adult population in Hungary who are regular or occasional hikers yields a result of 33.7 million EUR/year. This value is significantly smaller than the estimates in Table 2, which is exactly what could be expected based on the experience from the literature that studies using contingent

valuation typically yield lower estimates than those based on travel costs, with the latter considered to be more realistic. We therefore decided to keep the values in Table 2 as our final estimates for the value of forest recreation on the national level.

Table 2. Annual value of the recreation ecosystem service provided by forests to hikers for all of Hungary (in 2020 EUR).

		Value Per Visit (Million EUR)		
		Lower Estimate (1.3 EUR)	**Central Estimate (2.26 EUR)**	**Upper Estimate (3.22 EUR)**
Annual number of visits	lower estimate (40 million)	52.4	90.4	128.8
	central estimate (45 million)	58.8	101.7	144.9
	higher estimate (50 million)	65.2	113	161

To put our results into context, we compared our central estimate of 101.7 million EUR with the market value of wood produced from the country's forests (calculated based on data from the Hungarian Statistical Office regarding quantity and average prices of wood produced ([64,65])) and found that the recreation value corresponds to ~20% of the value of wood production in 2020. At the local level, this might of course vary significantly, with areas like the PBR where wood production is very limited due to the protected status generating a much higher benefit via recreation, while for most of the country's robinia and poplar forests, which are essentially tree plantations with low amenity value, the proportions would be the opposite.

As our country level estimate was not derived from the value for the PBR, it is interesting to compare whether the two estimates are compatible with each other. Based on forest area, the PBR represents just under 2% of the total forested area in the country, but our results indicate that it generates approximately 10% of the total recreation benefit to hikers. Our results also show how this 10% share comes about as a combination of the number of visits and the value per visit. Based on the number of visits, if our estimates are correct, the area of the PBR accounts for only a small proportion of all forest visits in the country (~1 million visits per year to the PBR vs. ~45 million visits on the national level translates to a share of 2.2% of forest visits taking place in the PBR, which is only slightly higher than the share of the PBR in the total forest area). This is not surprising because studies from various countries have shown that the distance/travel time has a very strong negative impact on the number of forest visits ([25,28]), meaning that forests in or very near big cities are where most visits (often just short walks) occur. In case of the Pilis, the local population is small, and the average hiker needs a 40–50 km drive to reach the starting point of the hike, so for most visitors, it does not serve day-to-day recreation purposes. At the same time, the recreational value of a single visit to the Pilis (7.56–13.15 EUR) is much higher than the average forest visit in Hungary (2.26 EUR). Considering these factors, it seems realistic that the PBR should account for ~10% of the national recreation benefit, which means that, at least in this case, the travel cost and the benefit transfer approach yield compatible results.

Finally, it is important to recognize some inherent limitations of the research. The data for the PBR contained some gaps that needed to be filled by expert judgement to estimate the exact visitor numbers, the time spent at the site, and the number of people travelling together. These gaps notwithstanding, our estimate was able to rely on data collected at and specific to the site examined. In the case of national values, however, the values were transferred from foreign studies and are thus subject to possible biases inherent to the benefit transfer methodology. We attempted to reduce the chance of such biases by adapting per visit rather than per hectare values and carefully selecting the studies used for the value transfer, choosing as our starting point meta-analyses that contain data from numerous primary studies across a wide variety of forest sites. This approach, however,

means that our national estimates should not be interpreted per hectare and used to derive local estimates; nor taken as a starting point for further benefit transfer processes.

4. Conclusions

As the first attempt at capturing the economic value of recreation ecosystem services in Hungary, our study focused on one of the most common outdoor recreation activities: hiking in the country's forests. In the absence of a primary survey, we relied on data from a previous study to obtain the recreation value for a popular hiking area (the Pilis Biosphere Reserve) based on travel costs. We then applied the benefit transfer methodology, adapting estimates for the average value per forest visit (or per person) from foreign studies to calculate an estimate for the whole country. We estimate the annual value of forest recreation for hikers in the Pilis Biosphere Reserve to be between 9.25 and 11.56 million Euros. For the whole country, the value is estimated in the range of 52.4–161 million Euros with a central estimate of 101.7 million EUR.

It is unfortunately a common occurrence that, while policy demand for the results is strong, time and/or resource limitations mean that ecosystem value estimates have to be generated with relatively limited data. Our study demonstrates that combining different data sources and approaches, including benefit transfer, can be a viable option in such situations. At the same time, we must of course recognize the uncertainty resulting from the gaps in data that had to be filled by expert judgements as presented above. This underlines the observation from Shrestha et al. [43] pointing to the importance of researchers' choices in the valuation process.

Overall, we can see that there is a good level of consistency between the results obtained by the various approaches used in this study: the local values for the Pilis Biosphere Reserve, the countrywide results from transferring the per-visit values, and the countrywide result based on the transfer of per person willingness to pay, with differences all pointing in the expected direction. This allows us to have some confidence that, despite the unknown factors that had to be estimated for the calculation, our final results correctly reflect the magnitude of the benefits from forest recreation enjoyed by hikers in Hungary. This is significant because no information was previously available on the value of recreation as an ecosystem service in Hungary. We believe (echoing Jadhav et al. [39]) that highlighting the non-market benefits in such a way can help authorities to better understand the importance of recreation aspects and consider them in their forest management decisions (as part of the MAES-HU project to implement the EU Biodiversity strategy in Hungary, the results of this study were commissioned by and have been presented to decision makers).

While we have been able to provide an estimate of the value of recreation for the PBR and for the country's forests as a whole, we have not been able to provide spatially detailed value estimates for other specific forest sites in the country. Thanks to the MAES-HU project, a lot of spatially detailed information regarding the characteristics of Hungarian forests (as well as other ecosystems) and their suitability for the purposes of recreation is now available. However, in order to assess the actual flow of recreation as an ecosystem service (which, in addition to the attractiveness of the site, is likely to be hugely influenced above all by proximity to population centers, but also the recreation habits of the local population), spatially detailed data on visitor numbers would also be necessary, which currently do not exist [11].

While there are plans to improve the collection of data regarding recreational visits to nature in Hungary [11], our study highlights the importance of designing these efforts in a way that the data collected is also suitable for the purposes of economic valuation. On-site visitor counts should elicit information regarding the duration of the visit, the distance and means of travel, the number of people travelling together, and the frequency of visits to the same site. An alternative to on-site surveys is a representative national survey that not only elicits information about people's general outdoor recreation habits, but also specific details about their last forest visit (such as the UK's Monitor of Engagement with the National Environment, see [66]). Such information would allow the estimation of demand

curves, could also be used to understand how certain site-specific characteristics contribute to the recreational value, and could serve as inputs for site-specific forest management decisions. In recent years, a methodology based on so-called crowdsourced environmental data (i.e., location-tagged social media postings) has been proposed as a cheaper alternative to traditional surveys to collect information on recreational visitor flows (see [67,68]). While this may indeed be a very useful way to obtain information on the number of visitors to certain areas, it also has many limitations, such as a lack of information on time spent at the site by visitors and insufficiently accurate information on their place of residence. These methods are also likely to undervalue forest sites used for daily recreation (which, as discussed, have been shown to provide the greatest part of the overall recreation benefit) compared to more "exotic" locations that may feature more prominently in social media uploads. For these reasons we believe that traditional surveys are still indispensable for the valuation of forest recreation as an ecosystem service.

Collecting new data would be especially important today because, in line with international observations, the COVID-19 pandemic has also led to an increase in the importance of forest recreation in Hungary. Forest authorities in the country reported that the number of forest visits set a new record in 2020, increasing by approximately 25–30% compared to previous years [54]. (In Hungary, the degree of restrictions imposed due to the pandemic varied throughout 2020, but forest visits, including more distant trips, were not subject to any limitations, even during the strictest lockdown period.) Therefore, it should be assumed that the current value of forest recreation has increased by at least this magnitude compared to our estimates (which are based on data generated prior to the COVID-19 pandemic). However, a simple upscaling of the values to represent the increased number of visits would not be sufficient to capture the changes as, under the circumstances, it is highly possible that the average benefit associated with each visit has also changed. It is of course too early to tell whether such changes will be permanent, but in any case, the need for new research is greater than ever to understand the changing function and value of nature-based recreation in a post-pandemic world.

Author Contributions: Conceptualization, A.S. and Z.S.; Methodology, A.S. and Z.S.; Formal analysis, A.S.; Writing—original draft, A.S.; Writing—review & editing, A.S. and Z.S.; Supervision, Z.S.; Funding acquisition, Z.S. All authors have read and agreed to the published version of the manuscript.

Funding: The project was co-financed by the European Regional Development Fund in the framework of the Environment and Energy Efficiency Operational Program of the Széchenyi 2020 Development Program. (Project title: Strategic Assessments supporting the long-term conservation of natural values of community interest as well as the national implementation of the EU Biodiversity Strategy to 2020. Project reference number: KEHOP-4.3.0-VEKOP-15-2016-00001).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data sharing not applicable.

Acknowledgments: The authors would like to thank all members of the MAES-HU project and the expert group for cultural ecosystem services, in particular Edina Csákvári. We would also like to thank all others who contributed information for this paper, in particular Péter Csépányi, Péter Palásti and Zita Zsembery.

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

References

1. Costanza, R.; d'Arge, R.; De Groot, R.; Farber, S.; Grasso, M.; Hannon, B.; Limburg, K.; Naeem, S.; O'neill, R.V.; Paruelo, J.; et al. The value of the world's ecosystem services and natural capital. *Nature* **1997**, *387*, 253–260. [CrossRef]
2. National Research Council. *Valuing Ecosystems Services: Toward Better Environmental Decision-Making*; National Research Council: Washington, DC, USA, 2005.
3. Hanley, N.; Barbier, E.B.; Barbier, E. *Pricing Nature: Cost-Benefit Analysis and Environmental Policy*; Edward Elgar Publishing: Cheltenham, UK, 2009.

4. De Groot, R.; Brander, L.; Van Der Ploeg, S.; Costanza, R.; Bernard, F.; Braat, L.; Christie, M.; Crossman, N.; Ghermandi, A.; Hein, L.; et al. Global estimates of the value of ecosystems and their services in monetary units. *Ecosyst. Serv.* **2012**, *1*, 50–61. [CrossRef]
5. Gowdy, J.M. Natural capital and the growth economy. *Sustain. Dev.* **1994**, *2*, 12–16. [CrossRef]
6. Spangenberg, J.H.; Settele, J. Precisely incorrect? Monetising the value of ecosystem services. *Ecol. Complex.* **2010**, *7*, 327–337. [CrossRef]
7. OECD. *Handbook of Biodiversity Valuation: A Guide for Policy Makers*; OECD Publishing: Paris, France, 2002. [CrossRef]
8. Johnson, J.A.; Ruta, G.; Baldos, U.; Cervigni, R.; Chonabayashi, S.; Corong, E.; Gavryliuk, O.; Gerber, J.; Hertel, T.; Nootenboom, C.; et al. *The Economic Case for Nature: A Global Earth-Economy Model to Assess Development Policy Pathways*; World Bank: Washington, DC, USA, 2021.
9. Vysna, V.; Maes, J.; Petersen, J.E.; La Notte, A.; Vallecillo, S.; Aizpurua, N.; Ivits, E.; Teller, A. Accounting for ecosystems and their services in the European Union (INCA). In *Final Report from Phase II of the INCA Project Aiming to Develop a Pilot for an Integrated System of Ecosystem Accounts for the EU*; Statistical report; Publications Office of the European Union: Luxembourg, 2021.
10. European Commission. Our life insurance, our natural capital: An EU biodiversity strategy to 2020. *COM* **2011**, *244*, 16.
11. Csákvári, E.; Fabók, V.; Babai, D.; Dósa, H.; Kisné Fodor, L.; Jombach, S.; Kelemen, E.; Tormáné Kovács, E.; Könczey, R.; Mártonné Máthé, K.; et al. A Gyalogos Természetjárás és Gombászás Mint Kulturális Ökoszisztéma-Szolgáltatások Értékelése—Az Ökoszisztéma-Állapottól a Ténylegesen Igénybe Vett Ökoszisztéma-Szolgáltatás Értékelésig. In *A Közösségi Jelentőségű Természeti Értékek Hosszú Távú Megőrzését és Fejlesztését, Valamint az EU Biológiai Sokféleség Stratégia 2020 Célkitűzéseinek Hazai Szintű Megvalósítását Megalapozó Stratégiai Vizsgálatok Projekt, Ökoszisztéma-Szolgáltatások Projektelem*; Agrárminisztérium: Budapest, Hungary, 2021; p. 119. [CrossRef]
12. Marjainé Szerényi, Z.; Csutora, M.; Harangozó, G.; Krajnyik, Z.; Kontár, R.; Nagypál, N. *A Természetvédelemben Alkalmazható Közgazdasági Értékelési Módszerek*; Környezetvédelmi és Vízügyi Minisztérium: Budapest, Hungry, 2005.
13. Vári, A.; Tanács, E.; Kovács, E.T.; Kalóczkai, Á.; Arany, I.; Czúcz, B.; Bereczki, K.; Belényesi, M.; Csákvári, E.; Kiss, M.; et al. National Ecosystem Services Assessment in Hungary: Framework, Process and Conceptual Questions. *Sustainability* **2022**, *14*, 12847. [CrossRef]
14. Bösch, M.; Elsasser, P.; Franz, K.; Lorenz, M.; Moning, C.; Olschewski, R.; Rödl, A.; Schneider, H.; Schröppel, B.; Weller, P. Forest ecosystem services in rural areas of Germany: Insights from the national TEEB study. *Ecosyst. Serv.* **2018**, *31*, 77–83. [CrossRef]
15. Secretariat of the Convention on Biological Diversity. *Review of the Status and Trends of, and Major Threats to, the Forest Biological Diversity*; SCBD: Montreal, QC, Canada, 2002; 164p, (CBD Technical Series no. 7).
16. Velasco-Muñoz, J.F.; Aznar-Sánchez, J.A.; Schoenemann, M.; López-Felices, B. An Analysis of the Worldwide Research on the Socio-Cultural Valuation of Forest Ecosystem Services. *Sustainability* **2022**, *14*, 2089. [CrossRef]
17. Derks, J.; Giessen, L.; Winkel, G. COVID-19-induced visitor boom reveals the importance of forests as critical infrastructure. *For. Policy Econ.* **2020**, *118*, 102253. [CrossRef]
18. Pichlerová, M.; Önkal, D.; Bartlett, A.; Výbošťok, J.; Pichler, V. Variability in Forest Visit Numbers in Different Regions and Population Segments before and during the COVID-19 Pandemic. *Int. J. Environ. Res. Public Health* **2021**, *18*, 3469. [CrossRef]
19. Bertram, C.; Larondelle, N. Going to the Woods Is Going Home: Recreational Benefits of a Larger Urban Forest Site —A Travel Cost Analysis for Berlin, Germany. *Ecol. Econ.* **2017**, *132*, 255–263. [CrossRef]
20. Matthew, N.K.; Shuib, A.; Gopal, N.G.R.; Zheng, G.I. Economic Value of Recreation as an Ecosystem Service in Ayer Keroh Recreational Forest, Malaysia. *Sustainability* **2022**, *14*, 4935. [CrossRef]
21. Nahuelhual, L.; Donoso, P.; Lara, A.; Núñez, D.; Oyarzún, C.; Neira, E. Valuing ecosystem services of chilean temperate rainforests. *Environ. Dev. Sustain.* **2006**, *9*, 481–499. [CrossRef]
22. Mayer, M.; Woltering, M. Assessing and valuing the recreational ecosystem services of Germany's national parks using travel cost models. *Ecosyst. Serv.* **2018**, *31*, 371–386. [CrossRef]
23. Zhao, X.; He, Y.; Yu, C.; Xu, D.; Zou, W. Assessment of Ecosystem Services Value in a National Park Pilot. *Sustainability* **2019**, *11*, 6609. [CrossRef]
24. Borzykowski, N.; Baranzini, A.; Maradan, D. A travel cost assessment of the demand for recreation in Swiss forests. *Rev. Agric. Food Environ. Stud.* **2017**, *98*, 149–171. [CrossRef]
25. Ezebilo, E.E. Economic value of a non-market ecosystem service: An application of the travel cost method to nature recreation in Sweden. *Int. J. Biodivers. Sci. Ecosyst. Serv. Manag.* **2016**, *12*, 314–327. [CrossRef]
26. Lankia, T.; Kopperoinen, L.; Pouta, E.; Neuvonen, M. Valuing recreational ecosystem service flow in Finland. *J. Outdoor Recreat. Tour.* **2015**, *10*, 14–28. [CrossRef]
27. Zandersen, M.; Tol, R.S. A meta-analysis of forest recreation values in Europe. *J. For. Econ.* **2009**, *15*, 109–130. [CrossRef]
28. Bateman, I.J.; Abson, D.; Beaumont, N.; Darnell, A.; Fezzi, C.; Hanley, N.; Kontoleon, A.; Maddison, D.; Morling, P.; Morris, J.; et al. Economic Values from Ecosystems. In *UK National Ecosystem Assessment: Technical Report*; UNEP-WCMC: Cambridge, UK, 2011; pp. 1067–1152.
29. Scarpa, R.; Hutchinson, W.G.; Chilton, S.M.; Buongiorno, J. Importance of forest attributes in the willingness to pay for recreation: A contingent valuation study of Irish forests. *For. Policy Econ.* **2000**, *1*, 315–329. [CrossRef]
30. Elsasser, P.; Weller, P. Aktuelle und potentielle Erholungsleistung der Wälder in Deutschland: Monetärer Nutzen der Erholung im Wald aus Sicht der Bevölkerung. *Allg. Forst- Und Jagdztg.* **2013**, *184*, 83–95.

31. Liu, W.-Y.; Lin, Y.-Y.; Chen, H.-S.; Hsieh, C.-M. Assessing the Amenity Value of Forest Ecosystem Services: Perspectives from the Use of Sustainable Green Spaces. *Sustainability* **2019**, *11*, 4500. [CrossRef]
32. Barrio, M.; Loureiro, M.L. A meta-analysis of contingent valuation forest studies. *Ecol. Econ.* **2010**, *69*, 1023–1030. [CrossRef]
33. Sen, A.; Harwood, A.R.; Bateman, I.J.; Munday, P.; Crowe, A.; Brander, L.; Raychaudhuri, J.; Lovett, A.A.; Foden, J.; Provins, A. Economic Assessment of the Recreational Value of Ecosystems: Methodological Development and National and Local Application. *Environ. Resour. Econ.* **2014**, *57*, 233–249. [CrossRef]
34. Bartczak, A.; Lindhjem, H.; Navrud, S.; Zandersen, M.; Żylicz, T. Valuing forest recreation on the national level in a transition economy: The case of Poland. *For. Policy Econ.* **2008**, *10*, 467–472. [CrossRef]
35. Liebelt, V.; Bartke, S.; Schwarz, N. Hedonic pricing analysis of the influence of urban green spaces onto residential prices: The case of Leipzig, Germany. *Eur. Plan. Stud.* **2018**, *26*, 133–157. [CrossRef]
36. Takács, D. Városi Szabadterek és Szabadtér-Fejlesztések Ingatlanérték-Befolyásoló Hatásának Elemzése Budapest Példáján. Ph.D. Dissertation, Szent István Egyetem, Tájépítészeti és Tájökológiai Doktori Iskola, Budapest, Hungary, 2016; p. 291.
37. Bowler, D.E.; Buyung-Ali, L.M.; Knight, T.M.; Pullin, A.S. A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health* **2010**, *10*, 456. [CrossRef]
38. Mártonné Máthé, K.; Császár, Z. Valóban aktív a magyar lakosság? Aktív és ökoturisztikai keresletet és motivációt felmérő kutatás. *Tur. Bull.* **2019**, *19*, 45–57.
39. Jadhav, A.; Anderson, S.; Dyer, M.J.B.; Sutton, P.C. Revisiting Ecosystem Services: Assessment and Valuation as Starting Points for Environmental Politics. *Sustainability* **2017**, *9*, 1755. [CrossRef]
40. Pinke, Z.; Vári, Á.; Kovács, E.T. Value transfer in economic valuation of ecosystem services–Some methodological challenges. *Ecosyst. Serv.* **2022**, *56*, 101443. [CrossRef]
41. Boutwell, J.L.; Westra, J.V. Benefit transfer: A review of methodologies and challenges. *Resources* **2013**, *2*, 517–527. [CrossRef]
42. Richardson, L.; Loomis, J.; Kroeger, T.; Casey, F. The role of benefit transfer in ecosystem service valuation. *Ecol. Econ.* **2015**, *115*, 51–58. [CrossRef]
43. Shrestha, R.; Rosenberger, R.; Loomis, J. Benefit transfer using meta-analysis in recreation economic valuation. In *Environmental Value Transfer: Issues and Methods*; Springer: Dordrecht, The Netherlands, 2007; pp. 161–177. [CrossRef]
44. Rosenberger, R.S.; Loomis, J.B. Using meta-analysis for benefit transfer: In-sample convergent validity tests of an outdoor recreation database. *Water Resour. Res.* **2000**, *36*, 1097–1107. [CrossRef]
45. Shrestha, R.K.; Loomis, J.B. Meta-analytic benefit transfer of outdoor recreation economic values: Testing out-of-sample convergent validity. *Environ. Resour. Econ.* **2003**, *25*, 79–100. [CrossRef]
46. Bergstrom, J.C.; Taylor, L.O. Using meta-analysis for benefits transfer: Theory and practice. *Ecol. Econ.* **2006**, *60*, 351–360. [CrossRef]
47. Hein, L. Economic Benefits Generated by Protected Areas: The Case of the Hoge Veluwe Forest, The Netherlands. *Ecol. Soc.* **2011**, *16*, 19. [CrossRef]
48. Lupp, G.; Förster, B.; Kantelberg, V.; Markmann, T.; Naumann, J.; Honert, C.; Koch, M.; Pauleit, S. Assessing the Recreation Value of Urban Woodland Using the Ecosystem Service Approach in Two Forests in the Munich Metropolitan Region. *Sustainability* **2016**, *8*, 1156. [CrossRef]
49. Lin, J.-C.; Chiou, C.-R.; Chan, W.-H.; Wu, M.-S. Valuation of Forest Ecosystem Services in Taiwan. *Forests* **2021**, *12*, 1694. [CrossRef]
50. KSH (Hungarian Central Statistical Office). 15.1.1.5. Erdőgazdálkodási Célú Erdőterület Az Elsődleges Rendeltetés Szerint. 31 December 2020. Available online: https://www.ksh.hu/stadat_files/kor/hu/kor0003.html (accessed on 16 January 2023).
51. KSH (Hungarian Central Statistical Office). 15.1.2.14. Erdők Vármegye És Régió Szerint, 2017–2021. 2020. Available online: https://www.ksh.hu/stadat_files/kor/hu/kor0058.html (accessed on 16 January 2023).
52. KSH. 15.1.1.6. A Faállománnyal Borított Erdőgazdálkodási Célú Erdőterület Megoszlása Fafajcsoportok és Korosztályok Szerint, 31 December 2022. Available online: https://www.ksh.hu/stadat_files/kor/hu/kor0004.html (accessed on 16 January 2023).
53. UNESCO-MAB. Pilis Biosphere Reserve Follow-Up Progress Report. 2017. Available online: http://www.nbmr.hu/_user/browser/File/UNESCO/Elorehaladasi_jelentesek/Pilis%20biosphere%20reserve%20follow%20up%20report%202017.pdf (accessed on 16 January 2023).
54. Pilisi Parkerdő. A Biztonságos Erdőlátogatás Fontosságára Hívja Fel a Figyelmet az Agrárminisztérium. 2021. Available online: https://parkerdo.hu/parkerdo/biztonsagos-erdolatogatas-fontossagara-hivja-fel-figyelmet-az-agrarminiszterium/ (accessed on 16 January 2023).
55. Benkhard, B.; Csákvári, E. A kulturális ökoszisztéma-szolgáltatások a gyalogos természetjárás szempontjából, budapest környéki hegységeinkben. In *Tájak Működése és Arculata*; Fazekas, I., Lázár, I., Eds.; MTA DTB Földtudományi Szakbizottság: Debrecen, Hungary, 2019; pp. 169–176.
56. Willis, K.G.; Garrod, G.D. The Individual Travel-Cost Method and the Value of Recreation: The Case of the Montgomery and Lancaster Canals. *Environ. Plan. C Gov. Policy* **1990**, *8*, 315–326. [CrossRef]
57. Juutinen, A.; Immerzeel, B.; Pouta, E.; Lankia, T.; Artell, J.; Tolvanen, A.; Ahtiainen, H.; Vermaat, J. A comparative analysis of the value of recreation in six contrasting Nordic landscapes using the travel cost method. *J. Outdoor Recreat. Tour.* **2022**, *39*, 100528. [CrossRef]

58. NAV (National Tax and Customs Administration). Korábbi Években Alkalmazott Üzemanyagárak. 2020. Available online: https://nav.gov.hu/nav/szolgaltatasok/uzemanyag/uzemanyagarak/Korabbi_evben_alkalma20150212.html (accessed on 15 April 2020).
59. KSH (Hungarian Central Statistical Office). A Teljes Munkaidőben Alkalmazásban Állók Kedvezmények Nélküli Nettó Átlagkeresete a Munkáltató Székhelyének Elhelyezkedése Szerint. 2020. Available online: https://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_qli030a.html (accessed on 15 April 2020).
60. Czajkowski, M.; Giergiczny, M.; Kronenberg, J.; Englin, J. The individual travel cost method with consumer-specific values of travel time Savings. *Environ. Resour. Econ.* **2019**, *74*, 961–984. [CrossRef]
61. KSH 2020b (Hungarian Central Statistical Office). A Személygépkocsi-Állomány Átlagos Kora Gyártmányok Szerint. 2020. Available online: https://www.ksh.hu/stadat_files/sza/hu/sza0026.html (accessed on 15 April 2020).
62. Pilisi Parkerdő. Egyre Jobban Szeretünk a Főváros Környékén Kirándulni. 2018. Available online: https://www.turistamagazin.hu/hir/egyre-jobban-szeretunk-a-fovaros-kornyeken-kirandulni (accessed on 15 October 2019).
63. Müller, A.; Knoke, T.; Olschewski, R. Can Existing Estimates for Ecosystem Service Values Inform Forest Management? *Forests* **2019**, *10*, 132. [CrossRef]
64. KSH. 1.1.1.4. Egyes Termékek És Szolgáltatások Éves Fogyasztói Átlagára. 2022. Available online: https://www.ksh.hu/stadat_files/ara/hu/ara0004.html (accessed on 16 January 2023).
65. KSH. 15.1.1.8. Fakitermelés az Erdőgazdálkodási Célú Erdőterületeken Fafajcsoportok Szerint. 2022. Available online: https://www.ksh.hu/stadat_files/kor/hu/kor0006.html (accessed on 16 January 2023).
66. Natural England. Monitor of Engagement with the Natural Environment (MENE). 2022. Available online: https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results (accessed on 16 January 2023).
67. Sinclair, M.; Mayer, M.; Woltering, M.; Ghermandi, A. Valuing nature-based recreation using a crowdsourced travel cost method: A comparison to onsite survey data and value transfer. *Ecosyst. Serv.* **2020**, *45*, 101165. [CrossRef]
68. Havinga, I.; Bogaart, P.W.; Hein, L.; Tuia, D. Defining and spatially modelling cultural ecosystem services using crowdsourced data. *Ecosyst. Serv.* **2020**, *43*, 101091. [CrossRef]

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