



Indicator 6.44

The importance of forests to people, 2013–2019

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What is this indicator and why is it important?

The ecosystem services people associate with forests can be economic, environmental, social, and spiritual. Factors including regions, demographics, and changing environmental attitudes may influence the different ecosystem services that forests support (Brown and Reed 2000). This indicator report provides insight into the importance of forests to private woodland owners and visitors to U.S. Department of Agriculture (USDA), Forest Service national forests.

What does the indicator show?

There are many ways to measure the importance of forests to people. In the previous indicator 6.44 report, a series of focus group discussions were conducted across varied U.S. populations (USDA Forest Service 2011). This updated report uses a different approach that leverages existing data, which may allow for replication to support more consistent future monitoring of this indicator.

First, data from the 2018 National Woodland Owners Survey (NWOS) were used to estimate the importance of ecosystem services for family forest owners in the United States. The ecosystem services analyzed included cultural, spiritual, regulating, and provisioning services (Millennium Ecosystem Assessment 2005). Second, to estimate the importance of public forest lands, data from the 2013 and 2019 National Visitor Use Monitoring Survey (NVUM) were used to estimate the willingness to pay (WTP) per person to travel to national forests. These datasets were chosen because they provided robust national-level data collected from landowners and recreation visitors with direct connections to forests.

Importance of Forests to Private Landowners

Privately owned forest land accounts for 56 percent of all U.S. forest land, of which 65 percent is owned by families or individuals, known as “family forest ownerships” (Butler et al. 2021). Family forest ownerships are defined as “family, individual, trust, estate, or family partnerships that own at least 1 acre of land with tree cover equal to or greater than 10 percent.” Administered by the Forest Service’s Forest Inventory and Analysis Program, the NWOS is a periodic survey distributed to owners or managers of private forests.

Table 44-1 provides descriptions for the categories of ecosystem services and the variables used to quantify the importance of each. Preferences for each NWOS variable were ranked on five-point Likert scales from “not important” to “very important” (including a not applicable category) and from “strongly disagree” to

“strongly agree.” For analysis, the authors quantified the percentage of landowners and acreage owned by landowners who indicated that cultural and/or spiritual values were important or very important as well as those who indicated that regulating and/or provisioning services were important or very important.

Table 44-1—Descriptions of each ecosystem service category and the relevant variables from the National Woodland Owners Survey (NWOS), included for reproducibility

Ecosystem service category	Description	NWOS variable name	NWOS variable description
Cultural/ Spiritual	A non-material benefit that contributes to the development and cultural advancement of people, including how ecosystems play a role in local, national, and global cultures; includes ethical value, existence value, recreation, and ecotourism.	OBJ_CHILD	How important are the following as reasons for why you currently own your wooded land in <STATE>? To pass land on to my children or other heirs.
		OBJ_REC	How important are the following as reasons for why you currently own your wooded land in <STATE>? For recreation, other than hunting.
		OBJ_HUNT	How important are the following as reasons for why you currently own your wooded land in <STATE>? For hunting.
		OBJ_FAM	How important are the following as reasons for why you currently own your wooded land in <STATE>? To raise my family.
		OBJ_BEA	How important are the following as reasons for why you currently own your wooded land in <STATE>? To enjoy beauty or scenery.
		OBJ_PRI	How important are the following as reasons for why you currently own your wooded land in <STATE>? For privacy.
Regulating	The benefit provided by ecosystem processes that moderate natural phenomena.	ATT_WOODDED	Please indicate your level of agreement with the following statements. I want my wooded land to stay wooded.
		OBJ_WIL	How important are the following as reasons for why you currently own your wooded land in <STATE>? To protect or improve wildlife habitat.
		OBJ_NAT	How important are the following as reasons for why you currently own your wooded land in <STATE>? To protect nature or biological diversity.
		OBJ_WAT	How important are the following as reasons for why you currently own your wooded land in <STATE>? To protect water resources.
Provisioning	Any type of benefit to people that can be extracted from nature. Includes food, timber, wood fuels, oils, medicinals, and nontimber forest products (NTFPs).	OBJ_NTFP	How important are the following as reasons for why you currently own your wooded land in <STATE>? For nontimber forest products, such as berries or maple syrup.
		OBJ_FIRE	How important are the following as reasons for why you currently own your wooded land in <STATE>? For firewood.
		OBJ_TIM	How important are the following as reasons for why you currently own your wooded land in <STATE>? For timber products, such as logs or pulpwood.

Sources: Millennium Ecosystem Assessment (2005); Butler et al. (2021).

Cultural and spiritual services are non-material benefits that contribute to the development and cultural advancement of people. According to Govigli and Bruzzese (2023), emotional and spiritual attachment to forests can include care and attachment toward forested spaces, cultural identity, quality of life or mood enhancement, and bequest values. NWOS questions that were included comprised topics such as passing on land to heirs, recreation, hunting, raising a family, beauty and scenery, and privacy to measure cultural and spiritual importance for owning wooded land.

Regulating ecosystem services include ecosystem processes that moderate natural phenomenon and include benefits derived from the ecosystem’s impact on natural processes (Smith et al. 2011). Questions from NWOS that were incorporated in this analysis include those related to perceived importance of maintaining the forest ecosystem along with natural and hydrological processes on their forested land, such as the desire for wooded land to stay wooded and the protection or improvement of wildlife habitat, biodiversity, or water resources.

Provisioning services are defined by the Forest Service as “the products or commodities obtained from forest ecosystems, including timber, food, and fresh water” (Smith et al. 2011). To identify the importance of provisioning services to landowners, NWOS questions

included in this analysis ask about the gathering non-timber forest products (such as berries or maple syrup), firewood, and timber products.

Data from the 2018 NWOS suggest an average of 94 percent of U.S. family forest owners indicated that the cultural or spiritual ecosystem services from their forests are important or very important to them (Butler et al. 2021; USDA Forest Service 2019). In addition, 97 percent of U.S. family forest owners reported that regulating or provisioning ecosystem services from their forested land were important or very important. These percentages represent an estimated 331 and 346 million acres of forest land, respectively (Butler et al. 2021).

Figures 44-1 and 44-2 illustrate the percentages of family forest land owned by people who found cultural or spiritual ecosystem services and regulating or provisioning ecosystem services from their forests important or very important. Preference differences at the county and town level likely exist among landowners; however, NWOS data do not currently provide insights to micro-level heterogeneity (Butler et al. 2021). Overall, privately owned forest land has relatively high percentages of owners who believe cultural or spiritual ecosystem services and regulating or provisioning ecosystem services are important, with a minimum of 86 percent (Vermont) and 73 percent (Idaho) of forest area, respectively.

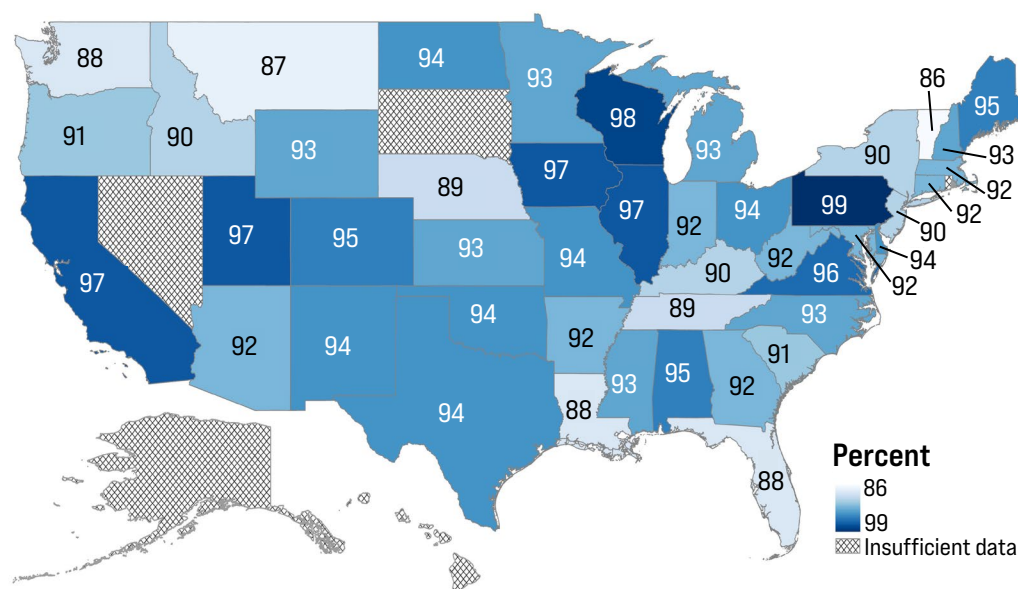


Figure 44-1—Map of the United States showing percentages of family forest land by State where landowners indicated cultural and/or spiritual needs and values were important or very important from results of the 2018 National Woodland Owners Survey.
Source: Butler et al. (2021).

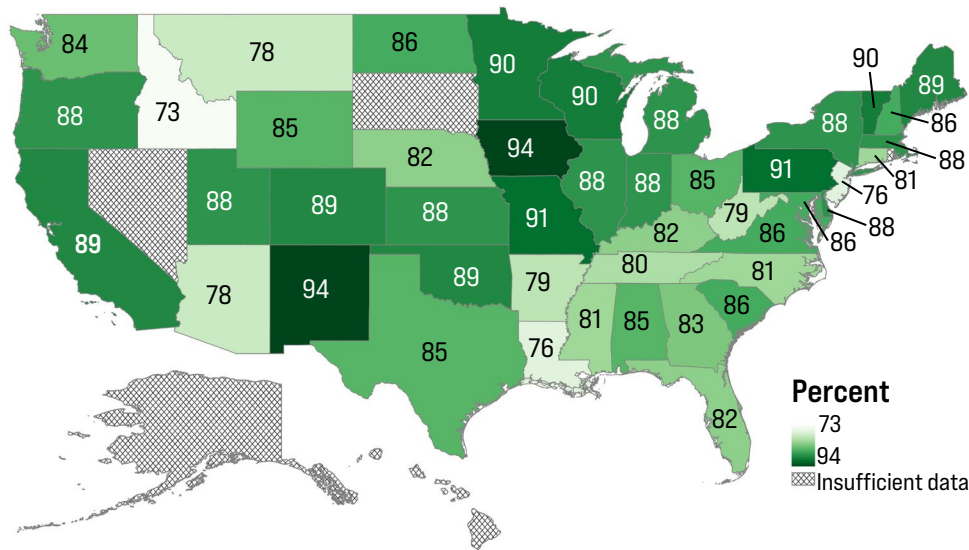


Figure 44-2—Map of the United States showing percentages of family forest land by State where landowners indicated regulating and/or provisioning needs and values were important or very important from results of the 2018 National Woodland Owners Survey. Source: Butler et al. (2021).

Table 44-2 describes the acreage of forest land owned by family forest owners who derive cultural or spiritual ecosystem services and/or regulating or provisioning ecosystem services from their forests. The South Region has almost 180 million acres of forest land associated with cultural or spiritual ecosystem services, followed by the North Region with 103 million acres. In addition, the South Region has more than 188 million acres with forest landowners who derive regulating or provisioning ecosystem services, followed by the North Region with

more than 106 million acres. Whereas the South Region and North Region have primarily private landownership, forest land in the Pacific Coast Region and the Rocky Mountain Region is primarily publicly owned, meaning there is less private land that can provide these services. However, both public and private lands support ecosystem functioning and fulfill cultural and spiritual needs. The next section quantifies the importance of national forests to recreation visitors.

Table 44-2—Percentages of family forest owners who derive cultural or spiritual services or regulating or provisioning services from their forests as well as the acres of forest land held by those landowners, by region [regions based on the USDA Forest Service's Resources Planning Act Assessment; see fig. 44-A1]

Region	Percentage of respondents who derive cultural or spiritual services from their forests	Acres of U.S. forest land that provide cultural or spiritual services	Percentage of respondents who derive regulating or provisioning services from their forests	Acres of U.S. forest land that provide regulating or provisioning services
North	95	102,526,532	97	106,808,156
Pacific Coast	94	17,827,442	97	18,854,903
Rocky Mountain	93	27,086,896	95	27,865,443
South	94	179,340,042	97	188,229,065
Alaska	Insufficient data			

Source: USDA Forest Service (2019).

Importance of Publicly Owned Forests

The importance of some publicly owned forests can be quantified using the NVUM survey (USDA Forest Service 2020; 2023). The NVUM surveys visitors to national forests on factors relating to their visit, including trip spending and distance traveled. Table 44-3 shows the average length of a trip taken (in miles) to each region. The longest distance traveled in both 2013 and 2019 were to Alaska—2,044 and 859 miles, respectively.

A modified travel cost method was used to estimate the amount an individual spends to visit a national forest, or their “willingness to pay” (WTP) (Brown and Mendelsohn 1984). WTP is a revealed preference method to estimate the benefit of non-tradable goods and services. Positive WTP indicates the goods and services provide the consumer a higher marginal benefit than marginal cost.

To estimate per person WTP, the authors first estimated the average party size for each region, excluding downhill skiers (White 2017). They found that on average, the Pacific Coast had the largest group size of 2.4 individuals per party, followed by the Rocky Mountain with 2.3 individuals per party, and the South, North, and Alaska with 2.2 individuals per party. Spending per trip was estimated by the NVUM respondent for their entire group, which included costs from motel and lodging, camping, restaurants and bars, gas and oil, local transport,

Table 44-3—Average length of trip (in miles) per region (regions based on the USDA Forest Service’s Resources Planning Act Assessment; see fig. 44-A1)

Region	2013	2019
Alaska	2,044	859
North	125	129
South	162	161
Rocky Mountain	390	353
Pacific Coast	306	241

Sources: USDA Forest Service (2013), (2019).

parking fees, recreation and entertainment, and goods purchases such as sporting goods, clothing, and souvenirs. The authors divided the average party expenditure by the average group size to estimate per person WTP. All WTP amounts were inflation adjusted to 2016 dollars.

Figure 44-3 illustrates the WTP to visit national forests in 2013 and 2019. Visitors were willing to pay the most to travel to visit national forests in Alaska per trip for both 2013 (\$1,001.63, reported in 2016 dollars) and 2019 (\$567.24, reported in 2016 dollars).

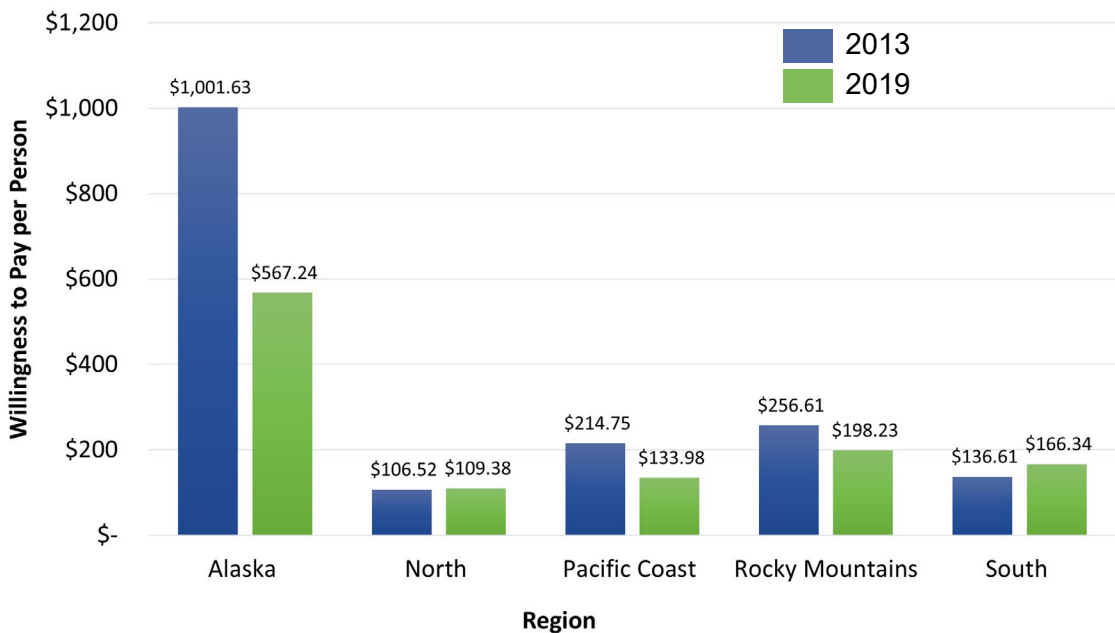


Figure 44-3—Average willingness to pay (WTP) to visit a national forest per person by region, adjusted to 2016 dollars using the Consumer Price Index inflation calculator and using National Visitor Use Monitoring Survey 2013 and 2019 data (regions based on the USDA Forest Service’s Resources Planning Act Assessment; see fig. 44-A1). Sources: U.S. Bureau of Labor Statistics (2024); USDA Forest Service (2013), (2019).

An increase in local recreation visitors to the Alaskan region may have decreased the average miles traveled, or there may have been a decrease in visitors from other States. The most dramatic increase in WTP occurred in the South Region, where WTP increased by 22 percent between the 2 survey years, whereas the WTP for the Pacific Coast Region decreased by 38 percent during the same time period.

What has changed since 2010?

It is not possible to directly compare findings from this report with the findings from the previous indicator report (USDA Forest Service 2011). Focus group participants from the previous report¹ highlighted a mix of consumptive and nonconsumptive uses, as well as range of cultural values individuals held for forests. The authors then ranked frequency of mentions for importance of forests. The top mentioned category was environmental or biological (i.e., wildlife and clean air), followed by: cultural heritage (i.e., memories and community); products (i.e., wood products and non-wood products); recreation (i.e., camping and hunting); sense of place (i.e., identity and attachment); health and well-being (i.e., psychological benefits and well-being activities); aesthetics; spirituality; diversity (i.e., habitat and biodiversity; economics; education; and privacy. In general, findings did not meaningfully differ. More than 90 percent of family forest owners reported that cultural, spiritual, regulating, or provisioning services were important or very important. Further, it is possible that recreation visitors to national forests derive both consumptive and non-consumptive values from public lands, although further research could be conducted to specifically quantify these values.

Why can't the entire indicator be reported at this time?

While the NWOS and NVUM datasets provided a great deal of information about perceptions of the importance of private and public forests in the United States, there

were significant limitations. First, the surveys sampled private forest owners and visitors to national forests. Neither sample represents the entire U.S. population, because many people do not visit national forests or own forest land. Furthermore, the NWOS survey does not survey privately owned forests on Tribal lands.

Further, NWOS does not have information on the proportion of land that exclusively provides economic, social, environmental, or spiritual ecosystem services. Thus, it was assumed all acres are used to support cultural, spiritual, regulating, and provisioning needs, so area estimates may be an overestimation. More data are needed for exact land-area estimates. Additionally, the standard errors associated with small forest holdings (1-9 acres) are large, so there is greater uncertainty with the estimations from NWOS data. For additional information on the methodology and constraints of NWOS data, refer to Butler et al. (2021).

Lastly, the travel cost method used for national forests is not a perfect proxy for value. Visitors may have taken the trip for reasons other than solely visiting a national forest. Or in other words, a group could have stopped at the national forest on their way to another destination. Thus, the value reported here could be overstated. In addition, average estimates on party size were used to estimate the per person WTP. Party sizes can vary, and therefore further analyses on the range of WTP and under differing conditions could be estimated in future work. Furthermore, data on the number and kind of substitutes available to visitors were not readily available at the national level, so this could not be accounted for in this analysis (English et al. 2019). In future analyses, assessing elasticity of demand could more accurately quantify the value of national forests to visitors (Ecosystem Valuation 2000).

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¹The authors of the previous indicator 6.44 conducted focus groups with a more representative sample from the U.S. public by age, gender, geographic location, race, and ethnicity.

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Appendix 1: Additional Figures

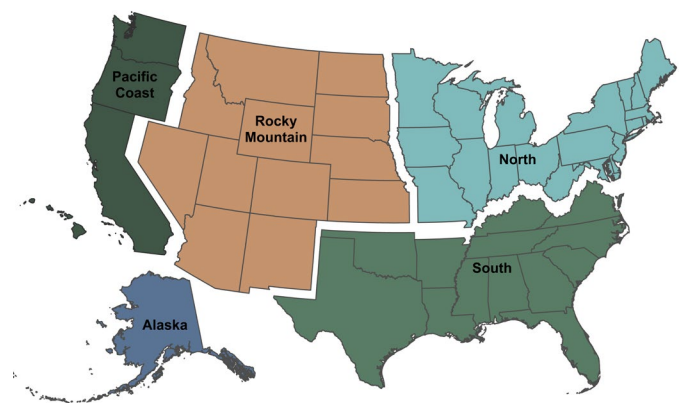


Figure 44-A1—Regions used in this indicator report, which are the same as those in the 2020 Resources Planning Act Assessment.
Source: USDA Forest Service 2023.

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