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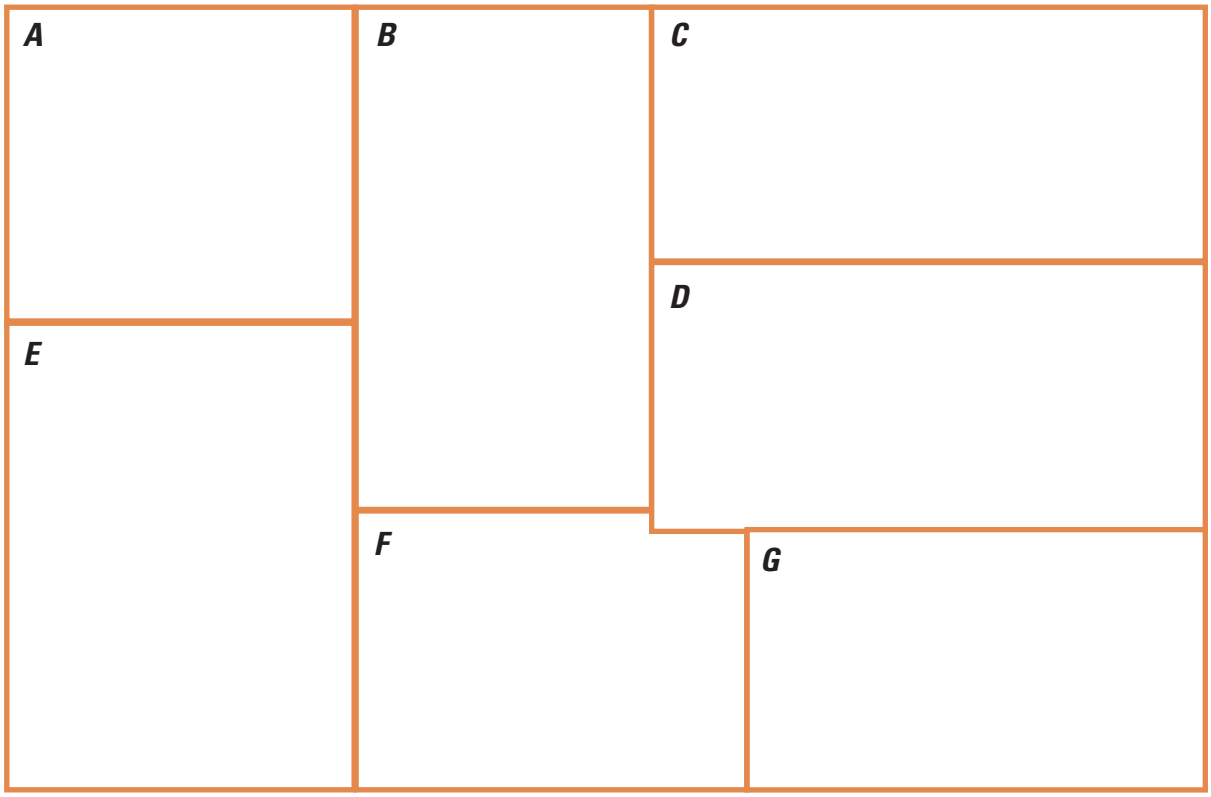
Prepared in cooperation with the U.S. Department of the Interior Office of Policy Analysis and University of Washington

Monitoring Recreation on Federally Managed Lands and Waters—Aspects of Visitor Use



Scientific Investigations Report 2026–5038
Supersedes preprint https://osf.io/preprints/socarxiv/usq34_v1

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By Emily J. Wilkins, Dieta Hanson, Whitney Boone, Spencer A. Wood, Christian Crowley, and Rudy Schuster

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Abbreviations

BLM	Bureau of Land Management
CBG	Census Block Group
Corps	U.S. Army Corps of Engineers
EXPLORE	Expanding Public Lands Outdoor Recreation Experiences Act
FS	U.S. Department of Agriculture Forest Service
FWS	U.S. Fish and Wildlife Service
GPRA	Government Performance and Results Act
GPS	Global Positioning System
IRMA	Integrated Resource Management Applications (used by the National Park Service)
NEPA	National Environmental Policy Act
NMS	National Marine Sanctuary
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NVS	National Visitor Survey (used by the U.S. Fish and Wildlife Service)
NVUM	National Visitor Use Monitoring (used by the U.S. Department of Agriculture Forest Service)
OFM	outcomes-focused management
OMB	Office of Management and Budget
ONMS	Office of National Marine Sanctuaries (within the National Oceanic Atmospheric Administration)
Reclamation	Bureau of Reclamation
SDK	Software Development Kit
SEM	Socioeconomic Monitoring (used by the National Park Service)
VURn	Visitor Use Reporting application (used by the National Park Service)
ZIP	zone improvement plan

Monitoring Recreation on Federally Managed Lands and Waters—Aspects of Visitor Use

By Emily J. Wilkins,[1] Dieta Hanson,[2] Whitney Boone,[3] Spencer A. Wood,[2] Christian Crowley,[3] and Rudy Schuster[1]

Abstract

Federally managed public lands and waters receive around 1 billion recreational visits each year. Data on these visitors can aid in guiding policy decisions, managing resources effectively, and communicating the economic contributions of lands and waters. This report explores the methods used by agencies to collect data on aspects of recreational visitor use to Federal lands and waters (apart from visitation numbers, which are the focus of a companion publication). Aspects of recreational visitor use include visitor demographics, recreational activity participation, visitor satisfaction, visitor attitudes and experiences, trip characteristics, and economic contributions. We review practices used to understand aspects of visitor use across seven Federal agencies, revealing similarities such as the use of visitor intercept surveys and coverage of similar topic areas, and differences in how survey programs are operationalized and how specific questions on visitor surveys are worded. We also evaluate emerging technologies, such as geolocated social media and mobile device location data, for their potential to aid in understanding aspects of visitor use. This report concludes with potential opportunities to enhance data collection and coordination, ensuring cost-effective data collection and informed decision making.

Introduction

U.S. Federal public lands and waters provide abundant recreation opportunities and receive around 1 billion recreational visits each year (Hanson and others, 2025). Agencies that manage Federal lands and waters are required to collect information about visitor use on those lands and waters. Broadly speaking, visitor use information can include visitation estimates (counts of visitors at a given place and time), trip characteristics, activity participation, visitor demographics, visitor spending, visitor satisfaction, visitor experiences, and visitor preferences. This information is used to inform a wide variety of management decisions and to understand the economic contributions of recreation on public lands and waters and surrounding communities. For example, visitor use data can inform recreation site planning, infrastructure and maintenance needs, staffing and visitor service needs, and budget allocation. A prior companion report reviewed the methods employed by agencies to collect and use data on recreational visitation to Federal lands and waters, as well as emerging technologies for estimating visitation (Hanson and others, 2025). This report expands on the prior report by providing insights into six additional ways agencies characterize aspects of visitor use, listed below:

- Visitor demographics—which are characteristics of visitors themselves, such as age, sex, race and ethnicity, education, income, and home location,
- Recreational activity participation—which consists of activities visitors participate in and visitors' primary activities,
- Visitor satisfaction—which represents visitors' overall satisfaction with their visits or satisfaction with certain aspects of their experiences (for example, satisfaction with recreational opportunities, facilities, or services),
- Visitor attitudes and experiences—which cover a wide range of topics, such as visitors' use of various facilities and programs, accessibility for visitors with disabilities, motivations for visiting, and perceptions of safety or crowding,
- Trip characteristics—which represents characteristics of recreational trips, including the length of trips, number of times re-entering a location, and people per vehicle, and

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- Economic contributions—which represents the total visitor spending in the local area and how that spending affects local economies.

Many Federal laws and policies necessitate data collection and reporting on visitor use, including:

- The Expanding Public Lands Outdoor Recreation Experiences Act (EXPLORE Act, Public Law 118–234, 16 U.S.C. § 8401 et seq.) directs the Secretaries of Interior, Agriculture, Commerce, and the Assistant Secretary of Army for Civil Works to "seek to capture comprehensive recreation use data to better understand and inform decision making by the Secretaries" (U.S. Congress, 2025, p. 28). The EXPLORE Act also directs agencies to establish a reporting system for annual visitation data, including categories of recreation activity, and calls on the Secretaries of Interior and Agriculture to develop an inventory and assessment of recreation resources for Federal recreation lands and waters.

- The Government Performance and Results Act of 1993 (GPRA; 31 U.S.C. § 1115 et seq.) and Government Performance and Results Modernization Act of 2010 (31 U.S.C. § 1115 et seq.) require agencies to develop strategic plans, annual performance plans, and annual performance reports. As part of this process, agencies measure performance related to strategic goals. For land and water management agencies, performance measures often include public satisfaction on Federal lands and waters.

- The National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. § 4321 et seq.) requires environmental assessments and environmental impact statements for Federal agency actions. Data on visitor use and economic impact of recreation can inform environmental assessments and environmental impact statements; the law specifically calls for "an interdisciplinary approach which will insure [sic] the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking." (U.S. Congress, 1970, p. 853).

- The Federal Lands Recreation Enhancement Act (16 U.S.C. 87) applies to the U.S. Department of Agriculture and the U.S. Department of the Interior. This act requires agencies to report on fee collections and expenditures, and authorizes sites to retain revenue for visitor services, including satisfaction surveys and infrastructure that supports recreation.

- Executive Order 12866, signed in 1993, requires certain analyses as part of the Federal regulatory process. This process is guided by the Office of Management and Budget (OMB) through guidance like Circular A-4. Data on visitor use and economic impact of recreation can inform the required analyses.

In addition to these Federal laws and policies that apply across multiple Federal agencies, there are some agency-specific laws and policies that may necessitate collecting certain data on visitor use. For example, the National Parks Omnibus Management Act of 1998 (16 U.S.C. 54 § 5901 et seq., recodified in U.S.C. § 100701–100707) states that the National Park Service (NPS) is "directed to assure that management of units of the National Park System is enhanced by the availability and utilization of a broad program of the highest quality science and information," and requires "a program of inventory and monitoring…to provide information on the long-term trends in the condition of National Park System resources" (U.S. Congress, 1998, p. 3–4). Similarly, the Federal Land Policy and Management Act of 1976 (43 U.S.C. §§ 1701–1787) states that "The Secretary [of the Interior] shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values)…This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values" (Bureau of Land Management, 2016). Additionally, the Department of the Interior regulations for Natural Resource Damage Assessment and Restoration under the Comprehensive Environmental Response, Compensation, and Liability Act (43 CFR Section 11) describes recreation as a service, the loss of which can be assessed in a claim for damages.

This report describes the methods used by Federal land and water management agencies to collect and report data on aspects of visitor use apart from visitation estimates. We review approaches used by the U.S. Army Corps of Engineers (Corps), Bureau of Land Management (BLM), Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (FWS), U.S. Department of Agriculture Forest Service (FS), National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS), and the National Park Service. We also review alternative and emerging approaches that may assist these agencies in understanding aspects of visitor use.

In the "Existing Methods to Collect Visitor Use Data" section of this report, we review the existing methods that Federal land and water managing agencies use to understand visitor use on Federal lands and waters. The methods for understanding visitor use predominantly consist of various visitor survey programs used at different agencies. In the "Novel Methods" section of this report, we review and assess the uses and limitations of newer and largely unused methods and data sources for understanding visitor use, including geolocated social media and mobile device location data. The "Implementing a Method" section of this report provides considerations for selecting a method to collect visitor use data (predominately focused on survey methodology), the tradeoffs associated with various survey strategies, and a broad overview of considerations for survey design. In the "Opportunities" section of this report, we discuss potential improvements to the ways in which recreational visitor use

is monitored. Finally, the "Legislative Activity" section of this report discusses recent legislation related to aspects of visitor use.

Existing Methods to Collect Visitor Use Data

The following section details the methods used by the Corps, BLM, Reclamation, FWS, FS, NOAA's ONMS, and NPS to understand aspects of visitor use on Federally managed lands and waters. We begin with a broad overview of survey programs at each agency, including what types of data are collected, then provide more in-depth summaries by agency. This report focuses on all aspects of visitor use apart from visitation estimation; for more information on how Federal agencies estimate visitation, refer to the companion report by Hanson and others (2025).

All seven Federal agencies use visitor surveys to collect data on visitor use on federally managed lands and waters. Most agencies use onsite intercept surveys, with some agencies coupling intercept surveys with post-trip online or mail surveys. Table 1 provides a broad description of survey programs at the seven agencies. The survey mode varies across agencies and may include:

- Comment cards, in which paper survey cards are usually left in visitor centers or other high-use areas and visitors decide if they want to fill them out (although staff may hand comment cards to select visitors in some cases);
- Intercept surveys, where visitors are stopped by staff, contractors, or volunteers onsite and asked if they are willing to participate in a survey;

Table 1. A summary of visitor survey programs (active as of 2025) to understand aspects of visitor use on Federal public lands and waters.

[Abbreviations: BLM, Bureau of Land Management; Corps, U.S. Army Corps of Engineers; NOAA ONMS, National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries; NVS, National Visitor Survey; NVUM, National Visitor Use Monitoring; OFM, outcomes-focused management; Reclamation, Bureau of Reclamation; SEM, Socioeconomic Monitoring]

Agency	Name of visitor survey program(s)	Brief description
U.S. Army Corps of Engineers	Visitor comment card	Visitor comment cards are administered to visitors at all Corps-managed parks and projects with over 50,000 annual visitors once every three years (Dena Williams, Corps, written commun., 2025).
Bureau of Land Management	Visitor satisfaction surveys Outcomes-focused management surveys	Visitor satisfaction surveys are administered at select sites each year as an intercept survey (Washington State University, undated). OFM surveys are used on an as-needed basis at select locations to understand additional aspects of visitor use ahead of a land use plan revision (Michelle Puckett, BLM, written commun., 2025).
Bureau of Reclamation	Visitor satisfaction surveys Recreation use survey	Visitor satisfaction surveys are administered at select management areas each year as an intercept survey. Reclamation also has a general suite of recreation survey questions that are customizable and can be used by individual locations as needed (Ronnie Baca, Reclamation, written commun., 2025).
U.S. Fish and Wildlife Service	National Visitor Survey	NVS surveys are administered as onsite intercepts coupled with a post-trip online or mail-back survey. All refuges with over 75,000 annual visitors are surveyed once every five years (Dietsch and others, 2025).
U.S. Forest Service	National Visitor Use Monitoring	NVUM surveys are administered as onsite intercepts. All forests and grasslands are surveyed once every five years (English and others, 2020).
National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries	Visitor center and exhibit surveys	Visitor center and exhibit surveys are intercept surveys administered to visitors at ONMS visitor centers and exhibits. NOAA ONMS is also in the process of developing a visitor use monitoring program in national marine sanctuaries called "Sanctuary Count" (Schwarzmann and Burns, 2025).
National Park Service	Socioeconomic Monitoring	SEM surveys are administered as onsite intercepts coupled with a post-trip, mail-back survey. Each year 24 representative park units are selected using stratified random sampling (Otak, Inc. and others, 2024).

- Online surveys, which are usually sent as a follow-up after an intercept survey if the surveyor asks for an email address, although online surveys could also be sent to potential participants with no previous in-person contact; and
- Mail surveys, which are usually used as a follow-up after an intercept survey if the surveyor asks for a mailing address, although paper surveys can also be sent directly through the mail with no previous in-person contact (for example, surveys of the general public).

Table 2 displays the categories of information and types of questions that at least two agency surveys ask visitors. Agencies have some commonalities in the types of questions they ask on surveys, although questions on the same general topic may be phrased differently. Additionally, there are many differences among agencies in what types of questions are asked, likely due to differences in data needs and how the agencies use the data. All seven agencies ask visitors for their age on visitor surveys, while information collected on other demographic characteristics varies from agency to agency. All agencies collect data on overall visitor satisfaction, with some agencies asking about satisfaction with recreation opportunities, facilities, or services as well. BLM, FWS, FS, NOAA ONMS, and NPS surveys collect information about activity participation (or what exhibits they visited, in the case of the ONMS visitor center and exhibit survey). There is variability in what questions agencies ask on visitor surveys related to trip characteristics, visitor attitudes and experiences, and economic contributions. While table 2 only includes types of questions asked across multiple agencies, there are additional question topics asked by only one agency. For example, NPS includes questions related to the use of electronic devices during visits.

Agencies ask questions on visitor surveys related to visitor spending primarily to inform analyses of economic contributions. Most Federal agencies managing lands and waters estimate the economic contribution of visits nationwide, while FS and the Corps also measure aggregate economic value nationwide (with other agencies estimating economic value on a local or case-specific basis) (Horsch and others, 2017). Economic contributions of recreation measure how spending by recreationists affects economies within a given geography (community, region, State, or Nation). The related term "economic impacts" refers to the effects of a new activity or an increase in activity, while "economic contributions" refer to the effects of an existing activity. Economists may use economic contribution analysis (input-output analysis) to estimate the effect of visitor spending on employment and income (Horsch and others, 2017). The economic value of a recreation activity differs from economic contribution and is a monetary measure of benefits to an individual or group engaging in that activity. For any one individual, the net economic value of a given recreation activity (also referred to as consumer surplus) is measured as the maximum amount the individual is willing to pay to participate in the activity, less the actual cost incurred by the individual to participate in that activity. Consumer surplus reflects the sense that a recreationist gets a "bargain" by being able to participate in their activity for less than the maximum amount they would be willing to pay to do so. In other words, consumer surplus reflects that visitors enjoy their activity more than they pay to engage in it, similar to profit for a business.

Agencies use differing approaches for estimating economic contributions and economic value and the report by Horsch and others (2017) provides a comprehensive summary of such approaches. The most common measures of economic contributions include spending, jobs, labor income, value added, and economic output. Generally, the process of estimating economic contributions involves identifying average visitor spending (potentially for a range of visitor profiles), annual visitation, and regional economic multipliers (Horsch and others, 2017). Many of the questions asked on visitor surveys under the "Economic contributions" section of table 2 are aimed at gathering data to inform these types of analyses.

Agency Summaries

The subsections in the "Agency Summaries" section detail the methods used by the Corps, BLM, Reclamation, FWS, FS, NOAA ONMS, and NPS to collect information on recreational visitor use on Federal lands and waters. These summaries were written by reviewing publicly available documents and websites from each agency, reviewing publicly available information associated with OMB control numbers (accessed at https://omb.report), and having written correspondence with agency staff (listed in the acknowledgements) in the spring and summer of 2025.

U.S. Army Corps of Engineers

The Corps uses a variety of different visitor surveys to understand visitor use. Currently (as of 2025), the Corps conducts customer satisfaction surveys every three years at recreation areas (parks and projects) managed by the Corps. This program informs Corps performance measures under GPRA and has been ongoing since GPRA was enacted in 1993. The Corps uses comment cards to conduct these surveys (OMB control number 0710-0019). Surveys are required every three years at each Corps-managed park or project that receives over 50,000 annual visits (approximately 480 parks or projects), and there is optional participation for Corps-managed parks or projects that receive fewer than 50,000 annual visits. In projects where there are more than 20,000 camping visits, comment cards target both day-use visitors and campers (with a target sample size of 160 surveys from day-use visitors and 160 surveys from campers). In places with fewer than 20,000 annual camping visits, the surveys are aimed at day-use visitors only, targeting a sample of 160

Table 2. Categories of information and types of questions asked on visitor surveys across multiple Federal agencies that manage public lands and waters. Specific questions only asked at one agency are not included in this table.

[Information in this table comes from reviewing survey instruments that are associated with each Office of Management and Budget (OMB) control number, searchable at https://omb.report. Abbreviations: BLM, Bureau of Land Management; Corps, U.S. Army Corps of Engineers; FS, U.S. Department of Agriculture Forest Service; FWS, U.S. Fish and Wildlife Service; NOAA ONMS, National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries; NPS, National Park Service]

Categories of information	Types of questions	Corps—Visitor comment card	BLM—Visitor satisfaction surveys	Reclamation—Visitor satisfaction surveys	FWS—National Visitor Survey	FS—National Visitor Use Monitoring	NOAA ONMS—Visitor center survey	NPS—Socioeconomic Monitoring
Visitor demographics	Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Gender or sex	Yes	Yes	Yes	Yes	Yes	No	Yes
	Income	No	No[1]	No	Yes	Yes	No	Yes
	Education	No	No[1]	No	Yes	No	Yes	Yes
	Race/ethnicity	Yes	No[1]	No[1]	Yes	Yes	No	Yes
	Home location	Yes	Yes	No	No[2]	Yes	Yes	Yes
Visitor satisfaction	Overall satisfaction	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Satisfaction with recreation opportunities	No	No	Yes	Yes	No	No	Yes
	Satisfaction with recreation facilities	Yes	Yes	Yes	Yes	Yes	No	Yes
	Satisfaction with services	Yes	Yes	Yes	Yes	Yes	No	Yes
	Perceptions of fee acceptability or value	Yes	Yes	No[1]	No	Yes	No	Yes
Trip characteristics	Trip duration (hours or nights)	No	No[1]	No[1]	Yes	Yes	Yes	Yes
	Group size	No	Yes	No	Yes	No	Yes	Yes
	Number in vehicle	No	No	No	No	Yes	No	Yes
	Type of group (for example, family, friends)	No	No	No[1]	No	No	No	Yes
	Number of visits within 12 months	Yes	No[1]	No[1]	Yes	Yes	No	Yes
	Number visits to other agency sites within 12 months	No	No	No[1]	Yes	No	No	Yes
	Was this their primary destination?	No	No[1]	No	Yes	Yes	No	Yes
	Primary reason or purpose for visiting	No	No[1]	No	Yes	Yes	Yes	Yes
	Payment of entrance or other use fees	Yes	Yes	No	No	No	No	Yes
	How they heard about the location or information sources used for planning	Yes	No[1]	No	Yes	No	Yes	Yes
	Types of overnight accommodations	No	No[1]	No	No	Yes	No	Yes
	Form of transportation used	No	No	No	Yes	No	No	Yes
Economic contributions	Spending in the local area by categories	No	No[1]	No[1]	Yes	Yes	No	Yes
Recreational activities[3]	Activity participation	No	Yes	No[1]	Yes	Yes	Yes[4]	Yes
	Primary activity	No	No[1]	No[1]	Yes	Yes	No	Yes

Table 2. Categories of information and types of questions asked on visitor surveys across multiple Federal agencies that manage public lands and waters. Specific questions only asked at one agency are not included in this table.—Continued

[Information in this table comes from reviewing survey instruments that are associated with each Office of Management and Budget (OMB) control number, searchable at https://omb.report. Abbreviations: BLM, Bureau of Land Management; Corps, U.S. Army Corps of Engineers; FS, U.S. Department of Agriculture Forest Service; FWS, U.S. Fish and Wildlife Service; NOAA ONMS, National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries; NPS, National Park Service]

Categories of information	Types of questions	Corps—Visitor comment card	BLM—Visitor satisfaction surveys	Reclamation—Visitor satisfaction surveys	FWS—National Visitor Survey	FS—National Visitor Use Monitoring	NOAA ONMS—Visitor center survey	NPS—Socioeconomic Monitoring
Visitor attitudes and experiences	Use of facilities, programs, or exhibits	Yes	No[1]	No[1]	Yes	Yes	Yes	Yes
	Accessibility for visitors with disabilities	No	Yes	No	Yes	Yes	Yes	Yes
	Motivations or reasons for visiting	No	Yes	No[1]	No	No	No	Yes
	Perceptions of safety	Yes	No	No[1]	Yes	Yes	No	Yes
	Crowding or congestion (including parking availability)	Yes	No[1]	No[1]	No	Yes	No	Yes
OMB Control number	Not applicable	0710-0019	1040-0001	1040-0001	0596-0236	0596-0110	0648-0582	1024-0224

[1]This type of question is not asked as part of the survey program listed in the table heading but is asked as part of a different survey program within the agency (that is active as of 2025). For the BLM, this is the outcomes-focused management (OFM) surveys (OMB control number 1004-0217), and for Reclamation this is their general recreation survey questions (OMB control number 1006-0028).

[2]The NVS does not ask about specific home location but does ask how far they traveled from their home in hours and minutes to get to the refuge.

[3]For more information about specific recreational activities each agency monitors, refer to Appendix 1.

[4]The visitor center surveys ask which exhibits visitors stopped at, which is similar to but different than how other agencies ask about activity participation due to the unique context of this survey. These surveys do not assume visitors to the visitor centers and exhibits also visited a national marine sanctuary, so "activity participation" would be limited to what they viewed or participated in at the visitor center or exhibit.

completed surveys (Dena Williams, Corps, written commun., 2025). These surveys are administered during the three-month period that receives the highest visitation (often summer) and collect data related to visitor satisfaction, demographics, trip characteristics, and visitor attitudes and experiences (refer to table 2). The Corps uses visitor use data to provide customer satisfaction feedback to managers and inform area managers about recreation management needs. The data can also be used to inform investment decisions or closure considerations for recreation areas.

Between 2011 and 2017, the Corps conducted vehicle exit (traffic stop) surveys at over 30 lakes across seven regions in the United States (OMB control number 0710-0001). The locations were chosen to be representative across regions and were recreation areas that had moderate to high visitation. These surveys were administered by people hired through the Student Conservation Association and collected a wider variety of data than the comment cards, including data on trip characteristics and activity participation.

The Corps reports annual information on total number of visits for different activities across the United States, as well as economic data generated from visits to Corps project sites, including total visitor spending, jobs, and value added. Spending profiles of visitors were created using survey data from 2011 to 2013 for different types of visitors, for example, campers and day-use visitors, and locals and non-locals. These profiles are used in conjunction with other data (for example, annual visitation and regional economic multipliers) to produce annual economic estimates including visitor spending, jobs, and value added (Dena Williams, Corps, written commun., 2025). These data are available on the Corps' Value to the Nation website (https://www.iwr.usace.army.mil/Missions/Value-to-the-Nation/Recreation/).

In addition to data collected through various survey efforts, the Corps uses data from carrying capacity studies to understand visitor perceptions of acceptable use patterns and Recreation.gov (Recreation One Stop) to better understand visitor use.

Bureau of Land Management

The BLM has two ongoing visitor use survey programs as of 2025: (1) visitor satisfaction surveys, and (2) outcomes-focused management (OFM) surveys. The BLM uses visitor use data from these surveys to inform land use plan revisions, provide feedback on whether management objectives are being met, inform site-specific NEPA analyses, and write business plans. Data from the BLM's visitor satisfaction surveys have historically been used to fulfill the requirements of GPRA to

report on agency performance related to visitor experience when the Department of the Interior's strategic plan includes visitor experience related goals or objectives.

The visitor satisfaction surveys are onsite intercept surveys conducted annually at one or two sites per administrative "state," for a total of 12–24 sites per year (OMB control number 1040-0001). BLM administrative "states" sometimes fall along State boundaries (for example, Colorado), but in other cases an administrative "state" may consist of multiple States (for example, the administrative state "Montana-Dakotas" represents Montana, North Dakota, and South Dakota) (BLM, undated). The sites are chosen by each administrative state often with input from field staff who can volunteer to conduct surveys at one of their sites. The questions mostly focus on topics related to visitor satisfaction, but also include questions about visitor demographics, trip characteristics, recreational activities, and visitor attitudes and experiences (refer to table 2). Washington State University assists with these surveys and the annual results from each site and nationwide are posted on the University's website (https://sesrc.wsu.edu/blm/reports/).

The OFM surveys are conducted as-needed to address a specific management need, usually ahead of a field office's land-use plan revision, which generally happens every 20–30 years (OMB control number 1004-0217). These surveys aim to cover most of a field office or the most popular recreation areas within a field office. The number of field offices conducting OFM surveys fluctuates each year depending on needs but tends to be around 3–6 per year. Visitors are intercepted onsite and asked for an email address to send a longer follow-up survey, or they are given a paper copy and asked for a mailing address to send reminders if they prefer a hard copy. The OFM surveys can include a range of questions and field office staff have some flexibility in choosing which questions they include based on what is useful for planning at their office. These surveys are intended to be used for planning at a field office level and are not intended to produce information that is representative at State or national levels.

The questions on the OFM surveys align with an OFM framework, which is used by the BLM (BLM, 2014). The OFM framework states that visitor experiences on public lands lead to onsite benefits, which are then linked to additional off-site benefits. A person's ability to obtain desired outcomes from their recreation experience depends on a variety of recreation site characteristics, so the survey questions are aimed at understanding the relation between recreation settings, management actions, recreation activities, and visitor outcomes (BLM, 2014). Questions may cover topics including visitor demographics, trip characteristics, visitor satisfaction, recreational activities, visitor spending, and visitor attitudes and experiences. Researchers at the University of Alaska Fairbanks and Colorado Mesa University have assisted with some of these surveys and results from studies they produce are publicly available on their website (https://www.uaf.edu/nre/plrrp.php), although this website does not contain results from all OFM surveys.

Besides data collected through visitor surveys, the BLM also uses individual Special Recreation Permits and Recreation Use Permits as sources for limited data on visitor use, such as home location of visitors (Greg Wolfgang, BLM, written commun., 2025).

Bureau of Reclamation

Reclamation has two ongoing visitor use surveys as of 2025: (1) visitor satisfaction surveys, and (2) broader recreation surveys. Reclamation uses visitor use data from these surveys to help site managers improve visitor services and recreational opportunities by informing resource management plans and needs assessments. Data from Reclamation's visitor satisfaction surveys have historically been used to fulfill the requirements of GPRA to report on agency performance related to visitor experience when the Department of the Interior's strategic plan includes visitor experience related goals or objectives (Ronnie Baca, Reclamation, written commun., 2025).

The visitor satisfaction surveys are conducted annually at two Recreation Management Areas or Wildlife Management Areas per region, for a total of 10 locations per year (OMB control number 1040-0001). The two sites per region are selected by regional coordinators based on numerous factors, including visitation levels and staff availability at the management area. These are onsite intercept surveys conducted during the recreation season (typically the summer at most locations). The primary purpose of these surveys is to understand and report visitor satisfaction, thus the questions mostly focus on topics related to visitor satisfaction (refer to table 2). Researchers at the U.S. Geological Survey analyze the data and write annual satisfaction reports; these reports are only available within Reclamation and are not published.

The broader recreation survey includes a general suite of questions that are customizable to the needs of a given management area (OMB control number 1006-0028). Questions may cover topics including visitor demographics, trip characteristics, visitor satisfaction, recreational activities, visitor spending, and visitor attitudes and experiences. Any management area can use this survey, and it is generally used to collect data to inform future resource management plans and needs assessments, and to gauge potential effects on users should a site be altered. These surveys are typically used at one to two locations per year, but this can vary depending on need. These are conducted as either a survey card that can be turned in or an onsite intercept survey (Ronnie Baca, Reclamation, written commun., 2025).

Reclamation recreation and wildlife areas are often managed by partners such as State, county, and city municipalities, and these partners may conduct their own visitor surveys at these locations. In addition to survey data, Reclamation also collects data through an annual data call related to fees, spending, and concession operations and revenue. Reclamation uses visitor use data for Department-wide reporting, market analyses, requests for proposals for

new concessionaires, resource management plants, budgeting, and decisions such as site alterations or improvements (Ronnie Baca, Reclamation, written commun., 2025).

U.S. Fish and Wildlife Service

The FWS maintains a National Visitor Survey (NVS) program, which is a central component of visitor use monitoring for the National Wildlife Refuge System. Each year, approximately 30 refuges are surveyed for the NVS. Refuges are selected on a five-year cycle, with any refuge with 75,000 or more annual visitors able to participate. Refuges are selected each year based on appropriate staffing to provide support for the survey team and appropriate locations to successfully contact 400 visitors per refuge. The survey is a combined onsite intercept followed by an after-visit, follow-up survey. Visitors are asked for their mailing address and sent a postcard with a link to take the survey online about a week after their visit (Dietsch and others, 2025). If they do not complete the online survey, visitors are sent a full paper survey with a return envelope. In total, visitors are contacted up to four times to take the survey (two online options and two paper survey options). Visitor surveys usually take place at selected refuges during two 14-day sampling windows, which vary by refuge and are intended to represent two different periods of visitor use (Dietsch and others, 2025). Staff from the American Conservation Experience have administered the onsite intercept survey, and staff from FWS along with Ohio State University, Clemson University, and University of Washington have administered the mail-back portion of the survey and managed data entry, storage, analysis and reporting for the NVS (Andrew Don Carlos, FWS, written commun., 2025).

The surveys are intended to be representative at the refuge level, and individual reports from each refuge are publicly available (https://iris.fws.gov/APPS/ServCat/Collection/Profile/2889). Full details on survey methodology and the survey instrument are in the appendixes of each report. Upon completion of a five-year cycle of survey administration, data from individual refuges are aggregated for national reporting. The data are weighted by annual visitation for each refuge prior to national-level analysis. The NVS completed its first five-year cycle in 2023 with 141 refuges participating and the first national report published in 2025 (Dietsch and others, 2025). These surveys cover a wide range of topics, including visitor demographics, spending, satisfaction, trip characteristics, and transportation and access (refer to table 2). The FWS is incorporating data related to visitor spending in a new analysis system to estimate the economic contributions of refuge visitation to local communities and the national economy (Andrew Don Carlos, FWS, written commun., 2025). Economic impact modeling efforts are provided in "Banking on Nature" reports (for an example of a previous Banking on Nature report, refer to Caudill and Carver, 2019).

The information collected through the NVS is used to inform decisions about managing recreation, improving access, and planning for visitor services and transportation. Additionally, the data inform infrastructure priorities and help ensure resources are protected while providing quality visitor experiences. For example, these data help inform the design of facilities, tailor services and facilities to match visitor interest and needs and better protect refuge resources by combining social data with biological data. The NVS information is also used to demonstrate the economic value that refuges provide to local communities and develop strategic communications with visitors (FWS, undated a). The data collected by the NVS can be used for comparisons across data collection efforts, including future efforts and previous efforts (for previous visitor surveys from 2010 to 2012, refer to Sexton and others, 2012). This collection of information from refuge visitors may be used by the FWS in the future to track and understand how complex changes occurring within American society (for example, demographic changes and stakeholder preferences) are associated with changes in visitor use and likely to affect the future of refuges.

In addition to the information collected through the NVS, the FWS gets limited visitor use data through permits. Certain recreation activities (for example, some hunting opportunities) require a permit and FWS tracks the number of permits issued. Permit holders may be recruited to participate in visitor surveys specific to their refuge activity. Individual refuges also periodically conduct visitor use studies for more specific purposes (for example, participants in special events, visitors to certain sites, and so forth) to inform specific planning needs. These limited data collection efforts are not part of the overall NVS effort (Andrew Don Carlos, FWS, written commun., 2025).

U.S. Forest Service

The FS's National Visitor Use Monitoring Program (NVUM) has two concurrent goals: "(1) to estimate the volume of recreation visits to units of the NFS [National Forest System], and (2) to describe salient characteristics of those visits, including activity participation, visit duration, visitor demographics, and visitor satisfaction" (English and others, 2020).

Surveys are conducted as onsite intercept surveys at around 24 forests or grasslands each year. Data are representative at the forest level but are not representative of certain sites or locations within a forest (except in special circumstances, such as for a National Recreation Area or a Wilderness Area within a forest). Forests and grasslands each participate in NVUM surveys on a regular five-year schedule, and this survey design allows for representative data at the national and regional levels when aggregating five years of data. NVUM has been collecting visitor use data using similar methods for over two decades, thus these data can be used to understand trends over time (English and others, 2020).

On average, there are about 230–240 survey dates per forest per year, and these are spread throughout the year to be representative of all seasons (English and others, 2020). Specific sites within each forest are chosen using stratified random sampling. Sites are stratified by level of use (low, medium, high, very high) and site type (day-use developed, overnight-use developed, wilderness, general forest areas). Each ranger district categorizes sites and days based on use levels (different days at the same site could have different levels of use, for example, weekends could be categorized as higher use than weekdays). Sampling times are randomly chosen as a six-hour period either in the morning or afternoon and evening. In some cases, FS also estimates visitor data for subunits in a forest, which often represent congressionally designated areas such as a National Recreation Area, National Monument, or Wilderness. For additional information on the NVUM sampling approach, refer to English and others (2020).

NVUM covers a variety of topics, including visitor demographics, spending, satisfaction, activity participation, trip characteristics, and visitor attitudes and experiences (refer to table 2). Since all questions are asked onsite without an off-site follow-up, to reduce the burden on respondents, the FS does not ask each respondent every question. All visitors are asked questions related to demographics, activity participation, and trip characteristics, while one-third are asked detailed questions on satisfaction, and a different third are asked detailed questions on income and visitor spending (English and others, 2020; FS, 2023). Data collected through NVUM are publicly available in the results application (https://apps.fs.usda.gov/nvum/results), which allows users to view data for a single forest, multiple forests, a region, or nationwide.

The FS uses these data for a wide variety of purposes, including congressional and departmental reporting, agency accomplishments reporting and communication, executive dashboards, NEPA analyses, forest and strategic planning, forest management, recreation management, partnerships, developing recreation budget formulas, and understanding the effects of natural disturbances (for example, effects of wildfire on visitation and spending) (English and others, 2020). Spending data are used to compute estimates of total visitor spending for individual forests and all forests combined. In addition, those spending estimates are used to further estimate the jobs and economic activity associated with visitor spending nationally and for individual forests. These economic data have been cited in FS budget justifications (FS, 2024). The spending averages estimated from the NVUM data have also been used by other Federal agencies (such as BLM) and State partners to estimate visitor spending. Since the FS has been collecting the same data through NVUM for over two decades, the agency can analyze trends in visitor use over time.

National Oceanic and Atmospheric Administration Office of National Marine Sanctuaries

NOAA ONMS has an ongoing visitor intercept survey program to evaluate visitor experience at national marine sanctuary (NMS) visitor centers and exhibits (OMB control number 0648-0582). These visitor centers and exhibits are on land and thus not located within sanctuaries. The visitor center surveys are entirely in-person and ask questions related to demographics, trip characteristics, communication preferences, awareness of NOAA and the NMS, and questions to assess learning and satisfaction associated with the exhibits about NMSs and ocean ecosystems. The data are not currently summarized to be representative nationwide, but are intended to be after surveys are administered at all visitor centers and exhibits (Danielle Schwarzmann, NOAA, verbal commun., 2025). NOAA ONMS may publish results from these surveys after more surveys are completed in 2026 (Danielle Schwarzmann, NOAA, verbal commun., 2025). NOAA ONMS is working to develop a visitor monitoring program within NMSs; refer to Schwarzmann and Burns (2025) for more information.

The NOAA ONMS has also conducted visitor surveys at select sites within NMSs in the past to better understand aspects of visitor use. Sites were selected based on need and program priorities; however, ONMS has not administered visitor use surveys in NMSs in over five years. During these surveys, visitors were intercepted onsite and had the option to complete the full survey either online or were given a paper copy to mail back. The surveys asked questions related to visitor demographics, spending, activities, satisfaction, trip characteristics, and visitor attitudes and experiences. Additionally, given that these surveys took place within NMSs, there were questions related to what wildlife visitors observed, expectations for viewing different types of wildlife, and how wildlife viewed affected satisfaction (OMB control number 0648-0763). Results from these surveys are available in individual reports (for example, Schwarzmann and Shea, 2020; Shea and Schwarzmann, 2021). In general, ONMS uses visitor use data to estimate economic contributions of activities within sanctuary boundaries to local communities and to help inform NEPA analysis. Visitor use data have also been used to understand the value of whale watching in NMSs (for example, Schwarzmann and Shea, 2020; Shea and Schwarzmann, 2021).

In addition to primary data collected through visitor surveys, ONMS uses secondary data collected by other Federal agencies, State agencies, local tourism boards, and other researchers to understand visitor use and economic contributions. For example, the Monroe County Tourism Development Council provides information on visitors to the county, including visitor demographics, trip characteristics, activity participation, and visitor spending (Rockport Analytics, 2025).

National Park Service

The NPS conducts annual visitor surveys as part of a Socioeconomic Monitoring (SEM) effort. These surveys are both systemic for national aggregation objectives and customized to serve park-specific needs. Surveys are administered at 24–30 park units per year during the peak visitation season of each park. Surveys are administered as onsite intercept surveys coupled with a mail-back survey with additional questions intended to be answered post-trip. NPS has a target of obtaining 400 complete post-trip surveys at most park units (Otak, Inc. and others, 2024). Park units are selected each year for SEM surveys using a stratified random sampling approach from all parks that collect and report visitation data. Park units are stratified into four park types based on their designation: natural, recreation, historic-urban, and historic-other. Each of these park types is split further into high visitation and low visitation parks, and then 3 parks are randomly selected from each of the 8 groups, for a total of 24 park units (NPS, 2024a). This stratified random sampling approach allows for a representative sample of parks each year, and NPS uses data weighting to create estimates that are representative nationally (for example, assigning different weights to survey data from each park depending on their total peak season visitation) (Otak, Inc. and others, 2024). Additional parks (beyond the 24 randomly selected parks each year) may opt-in for SEM surveys, but data from parks that are not part of the random sample are not included in national summary data.

The first full nationwide SEM data collection effort took place in 2022 (Otak, Inc. and others, 2024) after several years of piloting the program and detailing the need (Pettebone and Meldrum, 2018; Resource Systems Group, 2019). Each year, reports are made publicly available that detail nationwide results as well as results from each park unit that participated in SEM surveys that year (for all SEM reports, refer to https://irma.nps.gov/DataStore/Reference/Profile/2299324).

The national SEM sampling effort generates results on visitor use characteristics that aid in the calculation of visitation estimates at parks. It also highlights characteristics of use that go beyond visitation metrics, including visitor experiences, trip characteristics, demographics, and spending information to update economic contributions (refer to table 2 and NPS, 2025). The SEM data have a wide variety of uses across NPS and are intended to allow for analysis of trends over time. Visitor data can inform planning and decision making across a wide array of scenarios, including infrastructure, facility, transportation, visitor services, communications, and public affairs. Additionally, visitor use data inform interpretive programs, helping NPS plan, design, schedule, and implement more effective park interpretation (NPS, 2025). Visitor use data also inform partnership strategies by helping NPS identify critical stakeholders associated with distinct visitor segments. Furthermore, data on trip characteristics and spending are used to develop spending profiles of visitors and estimate economic contributions of visitation to NPS units (Flyr and Koontz, 2024; NPS, 2024b). For specific examples of how SEM data have been used, refer to NPS, 2025.

In addition to the park units selected randomly to participate in SEM surveys each year, parks engaged in planning and management decision making often fund and use custom surveys to inform visitor use, resource, facility, and service-level decisions (Bret Meldrum, NPS, written commun., 2025). Apart from data collected through SEM and other visitor surveys, NPS collects other visitor use information through permits and commercial use authorizations (often limited to areas with remote and dispersed use access) and concessioners and private operators who report data on sales and use. As an example of streamlining the process of collecting this type of administrative data, NPS has developed the Alaska-specific Visitor Use Reporting (VURn) application (NPS, undated). VURn allows commercial operators to create an account and submit activity reports directly into the NPS Integrated Resource Management Applications (IRMA) Portal for review and access by park staff. This approach avoids the need for park staff to develop the data from hardcopy or e-mail reports. NPS also has data on transit system usage collected through the NPS National Transit Inventory (NPS, 2024c), and information related to visitor attendance at interpretation, education, and volunteer programs.

Lastly, NPS has begun testing the use of novel and emerging datasets to better understand visitor use. For example, NPS tested the use of mobile device data in two NPS units in Virginia to understand aspects of visitor use including home locations, demographics, and whether visitors were visiting multiple NPS sites (Pettebone and others, 2025). NPS found that the visitor use metrics derived from mobile device data differed substantially from the same metrics measured through a visitor survey; for example, the mobile device data indicated that many more visitors were local as compared to the survey data. However, the authors noted several reasons for the divergent results, including sampling different visitor populations, and concluded that these data are complementary to the SEM data, rather than a replacement of survey data, given the potential data limitations (refer to Novel Data Methods—Visitor Demographics section for more information). NPS is also currently piloting the use of sentiment analysis for reviews of NPS sites posted on Recreation.gov and Google to provide additional information about visitor experiences (Bret Meldrum, NPS, written commun., 2025).

Surveys of the General Public

In addition to the survey programs described in the subsections above that focused on understanding aspects of visitor use, some Federal agencies administer general public surveys. These general public surveys provide data to help learn about both visitors and non-visitors, including topics

such as perceived barriers to visitation and the total number of Americans who participate in certain outdoor recreation activities.

The NPS administers the Comprehensive Survey of the American Public, with the most recent survey in 2018 and two prior iterations of the survey in 2000 and 2008–2009 (Resource Systems Group and Wyoming Survey and Analysis Center, 2020). This is a nationwide telephone survey and aims to collect data related to public attitudes and behaviors related to programs and services provided by the NPS. Because the survey is nationwide, it captures both NPS visitors and non-visitors and asks non-visitors questions related to perceived barriers to visiting NPS units. The most recent Comprehensive Survey of the American Public in 2018 included additional questions related to program awareness and youth engagement (Resource Systems Group and Wyoming Survey and Analysis Center, 2020).

The FWS administers the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. The most recent survey was administered in 2022, with prior surveys roughly every 5 years (2016, 2011, 2006, 2001, 1996, 1991, and other versions of a similar survey dating back to 1955) (FWS, undated b; FWS, 2022). The 2022 survey used mixed methods to collect responses, consisting of online, telephone, and mail-back paper questionnaires (FWS, 2022). This survey collects information on the number of anglers, hunters, and wildlife watchers in the United States, how often they participate in those activities, and how much money they spend on those activities. Since this is a general public survey, it captures responses of people who visit wildlife refuges as well as those who do not.

Summary of Active Survey Programs Across Agencies

As described in the prior "Agency Summaries" sections, all seven Federal agencies have ongoing visitor survey programs as of 2025. Three agencies (FWS, FS, NPS) have visitor survey programs that produce national-level data (representing the population of recreational visitors to all of an agency's lands nationwide) in addition to local-level estimates (for example, by refuge, forest, or park). Three agencies (Corps, BLM, Reclamation) conduct surveys aimed at describing use of a site or unit and are not intended to be representative nationally. NOAA ONMS intends to administer surveys at all visitor centers and exhibits in the future, after which data could be summarized nationwide (Danielle Schwarzmann, NOAA, verbal commun., 2025). Of the nationally representative surveys, NPS uses stratified random sampling to select a representative set of park units each year, while FS and FWS survey 20 percent of their eligible units each year, such that every five years all eligible units have been surveyed (aggregating five years of unit-level data produces the set of nationwide data). The number of units or sites where surveys are administered each year varies across agencies. Refer to table 3 for a summary of characteristics and details of visitor survey programs across agencies.

Table 3. Summary of characteristics and details of visitor survey programs used to understand aspects of visitor use on Federal public lands and waters as of 2025.

[Data come from the following sources: Dena Williams (U.S. Army Corps of Engineers [Corps], written commun., 2025) for the Corps; Washington State University (undated) and Michelle Puckett (Bureau of Land Management [BLM], written commun., 2025) for the BLM; Ronnie Baca (Bureau of Reclamation [Reclamation], written commun., 2025) for the Reclamation; U.S. Fish and Wildlife Service [FWS] (undated) and Dietsch and others (2024) for FWS; English and others (2020) for the U.S. Forest Service (FS); Danielle Schwarzmann (National Oceanic and Atmospheric Administration [NOAA], written commun., 2025) for the NOAA Office of National Marine Sanctuaries (ONMS); Otak, Inc. and others (2024) for the National Park Service (NPS). Each Office of Management and Budget (OMB) control number is searchable at https://omb.report. Abbreviations: Approx., approximately; OMB, Office of Budget and Management]

Characteristics of visitor surveys	Corps	BLM	Reclamation	FWS	FS	NOAA ONMS	NPS
Name of survey program	Visitor comment card	Visitor satisfaction surveys[1]	Visitor satisfaction surveys[2]	National Visitor Survey (NVS)	National Visitor Use Monitoring (NVUM)	Visitor center and exhibit survey	Socioeconomic Monitoring (SEM)
Survey mode	Comment card (often handed to selected visitors to fill out onsite, similar to an intercept survey)	Onsite intercept	Onsite intercept	Onsite intercept coupled with post-trip mail-back or online survey	Onsite intercept	Onsite intercept	Onsite intercept coupled with post-trip mail-back
Spatial scale of survey data	Park and project level	Recreation sites	Management Area level	Refuges	Forest or grassland	Visitor center or exhibit[3]	Park unit
Number of units or sites per year for surveys	Around 480 every 3 years	12–24 recreation sites	10 management areas	30 refuges	21–26 forests or grasslands	Varies	24 park units
How are units (parks, forests, refuges, projects, sanctuaries, or BLM sites) selected?	Required participation for all projects with over 50,000 annual visits	Each administrative "state" selects 2 sites annually	2 per region, selected by regional coordinators based on visitation levels, staff availability	5-year cycle of all refuges with over 75,000 annual visitors	5-year cycle of all forests and grasslands	Based on program priorities	Stratified random sampling (by park type and visitation levels)
Timing of visitor surveys	During the peak season (usually summer)	During the peak season (usually summer)	During the peak season (usually summer)	During two seasons (varies by refuge)	Year-round	Year-round	A 12-day window during the peak season (usually summer)
Target number of completed surveys per unit (or site)	Varies, usually 160 or 320 complete[4]	Unknown; most often 50–150 complete in 2024	200 complete	400 contacts (approx. 200 complete)	Varies by unit, but averages 235 sample days per unit	300 complete	400 post-trip surveys at most units
Are survey data rolled up nationwide?	No, but data from comment cards are summarized at district and division levels	No (apart from annual satisfaction)	No (apart from annual satisfaction)	Yes, aggregating 5 years of data and using data weighting	Yes, aggregating 5 years of data	Not yet, but maybe once all locations have completed surveys	Yes, using data weighting
Are survey results publicly available in reports?	No	Yes	No	Yes	Yes	Available by request; publication expected in 2026–27	Yes

Table 3. Summary of characteristics and details of visitor survey programs used to understand aspects of visitor use on Federal public lands and waters as of 2025.—Continued

[Data come from the following sources: Dena Williams (U.S. Army Corps of Engineers [Corps], written commun., 2025) for the Corps; Washington State University (undated) and Michelle Puckett (Bureau of Land Management [BLM], written commun., 2025) for the BLM; Ronnie Baca (Bureau of Reclamation [Reclamation], written commun., 2025) for the Reclamation; U.S. Fish and Wildlife Service [FWS] (undated) and Dietsch and others (2024) for FWS; English and others (2020) for the U.S. Forest Service (FS); Danielle Schwarzmann (National Oceanic and Atmospheric Administration [NOAA], written commun., 2025) for the NOAA Office of National Marine Sanctuaries (ONMS); Otak, Inc. and others (2024) for the National Park Service (NPS). Each Office of Management and Budget (OMB) control number is searchable at https://omb.report. Abbreviations: Approx., approximately; OMB, Office of Budget and Management]

Characteristics of visitor surveys	Corps	BLM	Reclamation	FWS	FS	NOAA ONMS	NPS
OMB control number	0710-0019	1040-0001	1040-0001	0596-0236	0596-0110	0648-0582	1024-0224

[1]In addition to this survey program, the BLM has outcomes focused management (OFM) surveys that are used on an as-needed basis at select locations to understand additional aspects of visitor use, including visitor motivations and outcomes (OMB control number 1004-0217). These surveys tend to take place at 3–6 field offices ahead of a land use plan revision.

[2]In addition to this survey program, Reclamation has a general suite of recreation survey questions that are customizable and can be tailored to the needs of any location. This is used at about one or two locations per year but varies based on the need (OMB control number 1006-0028).

[3]These visitor centers and exhibits are not located within sanctuaries, but at locations near sanctuaries.

[4]If a survey aims to target either day-use visitors or campers, the target number of completed surveys is 160. If a project has over 50,000 annual visits and over 20,000 annual camping visits, then they are expected to conduct surveys of both day-use visitors and campers, with 160 completed surveys for each and a total of 320 completed surveys.

Novel Methods

In the last decade, a body of research has focused on developing and testing novel methods for measuring aspects of visitor use. A prior companion report summarized research on novel methods for estimating visitation (Hanson and others, 2025), while this report summarizes studies evaluating methods for estimating other aspects of visitor use. Consistent with findings reported in the companion report, there has been an increase in research on and application of novel methods for measuring visitation (Hanson and others, 2025), but we have found there is much less research on novel methods for estimating other aspects of visitor use. While visitation is a straightforward metric to measure, being a count of visitors, other visitor use metrics can be more complex (visitor experience, for example, is a more dimensional measure), which may explain the difference in research focus.

For this report, we reviewed scientific literature for research on novel methods for measuring aspects of visitor use. We considered only studies that evaluated novel data and methods—typically using some form of ground-truth data, often collected through visitor surveys. We found a limited number of studies that have done any evaluative work, and only for measurement of visitor home locations, visitor demographics, visitor activities, and visitor experiences. There are no studies to our knowledge evaluating the use of novel data for measuring direct visitor spending or trip characteristics, and very limited work on methods for estimating visitor preferences or satisfaction.

To summarize the state of the research, this section begins by outlining the two main types of novel data—geolocated social media data and mobile device location data—that have been used to measure visitor use. This is followed by a "Novel Data Methods" section with an overview of the research that has been done on methods for measuring visitor home locations, demographics, activities, and experiences, and a discussion of some of the specific considerations for each of those uses. Finally, we end with a "Novel Data Assessment" section containing a discussion of strengths and weaknesses of emerging approaches for estimating visitor use metrics.

Geolocated Social Media Data

Social media data in the context of visitor use research refers to user-generated content from a social media platform that has been geotagged (associated with a geographical location) and timestamped, allowing researchers to associate a visitor (the person who created the digital content) with a particular recreational site at a particular time. There are two main types of social media platforms in the context of visitor use. The first type is image-sharing platforms, where visitors upload geolocated photographs from their visits to public lands and waters. The second type is location-sharing platforms where users can geotag a post with the location where it was generated. Different platforms allow different access to the user-generated content; some charge for access whereas others allow free access or access to a subset of posts.

Mobile Device Location Data

Mobile device locations are a fairly new source of data, emerging from the increased use of mobile devices connected to the internet. Mobile devices, such as mobile phones, tablets, and smartwatches, are used to collect location information

via applications (apps) and their associated software, often provided through Software Development Kits (SDKs). These apps and SDKs typically use global positioning systems (GPS) to determine the device's location. Once collected, this information is transmitted over the internet to people who developed the app or SDK, who can sell it, typically to third party data vendors. The final product that is resold to consumers is a dataset that can consist of anonymous device identifiers, timestamps, and latitudes and longitudes indicating the location of devices through time. In other cases, the products consist of aggregated summaries of the location data (for example, how many total devices were detected on a given day at a given location).

Novel Data Methods

This section gives an overview of research on the use of novel data in estimating aspects of visitor use. Specifically, we review research using novel data to understand visitor home locations, visitor demographics, visitor activities, and visitor experiences.

Visitor Home Locations

Both geolocated social media and mobile device location data have been used to infer home locations of visitors to public lands such as parks. The majority of studies on this topic have evaluated methods relying on geolocated social media; we found seven published studies investigating whether social media posts can be used to infer home locations of visitors to public lands through comparison with data collected through intercept surveys. These studies explored two main methods for determining home locations: the reported home locations provided in public profiles of the social media users, and inferred locations based on spatial patterns in locations of users' social media posts. The first method, proposed and tested by Wood and others (2013) was further evaluated by Sessions and others (2016) and Sonter and others (2016) by comparing home locations from the user profile of Flickr users who posted photographs from U.S. public lands with survey data from those same lands. Both studies observed that the proportion of visitors from in-State or out-of-State (or international), were generally correlated between the two data sources, although the relationship differed by geography. Sessions and others (2016) observed that visitors coming from international locations were overestimated and those from out-of-state were underestimated based on the number of photographs posted. Similarly, Liang and others (2023) observed that the self-reported home State (or country of international visitors) for Twitter users who posted tweets geotagged to Yellowstone National Park generally agreed with location of survey respondents for the top 10 origins, although some locations appeared on one list but not the other.

A second approach for using social media to estimate home locations is based on the locations of all geotagged media posted by each user who has been identified as a park visitor (based on geotagged posts within an area of interest). Several methods have been proposed, the simplest of which is to infer a visitor's home based on the location where each user creates largest number of geotagged social media posts. More complicated methods have also been developed, such as geospatial clustering of the geotagged posts and using machine learning methods (Martinez-Harms and others, 2018). Using a simpler method, Heikinheimo and others (2017) first identified visitors to parks in Finland based on their Instagram posts geotagged to those parks, then looked at the country or region within Finland where those same users had the most geotagged posts. They found no difference in the distribution of frequencies of home locations by country based on their method and those from in-person survey responses. Exploring a wider variety of methods, Sinclair and others (2020) used five different measures, including the place with the maximal timespan between the first and the last photograph, to determine home location. Their methods produced accuracy at a country level between 76 percent and 89 percent, but lower accuracy at the subcounty level. A study of visitors to Kruger National Park in South Africa used several different spatial, clustering, and spatiotemporal methods applied to their entire set of geotagged Instagram posts to determine home locations and compared the results to official visitor statistics (Heikinheimo and others, 2022). While they found generally high correlation between the ground-truth data and the estimated home location country, some methods had higher accuracy, such as the geographic median of a user's full set of geotagged posts. They also observed that certain other characteristics of social media users' accounts or patterns in their social media use were related to the accuracy of the home location estimate. For example, the total number of countries where a user had posted geolocated social media was inversely related to the accuracy of the home location estimate, while the number of months of active social media use (at least one geotagged post) contributed positively to accuracy.

In general, the use of geotagged social media for determining park visitor home locations shows promise at some spatial scales, but the methods should be applied with caution given research showing that accuracy can vary depending on the specific methods used and the geographical resolution at which home locations are estimated (country versus State, for instance). Further evaluation of the stated home location versus inferred home location methods—for instance, through comparisons with survey data—could help quantify and characterize the accuracy of different approaches to using social media to determine visitors' origins.

Compared with research evaluating methods using social media, there has been less research examining the use of mobile device location data for estimating home locations. Two published studies have measured how home location estimates from commercially available mobile device location datasets compare with stated home locations of visitors to

national parks in the United States. In both studies, the third-party vendors who sold the data applied their own methods to determine the home location of a given device based on the user's entire history of mobile device location data, which the researchers then used to compare to ground-truth data. Liang and others (2022) used the home locations determined by a data vendor for devices that had been detected within Yellowstone National Park and determined the home State using devices' known locations between the hours of 6 p.m. and 7 a.m. (nighttime hours) over a six-week span. When compared with a survey of park visitors, the lists of the top 10 States were almost identical, although the rank order of States differed. The mobile device location data overestimated the number of visitors from Wyoming (the State containing most of the park's area), which the authors suggest was due to mobile device location data capturing park employees who were likely not recreating and thus not included in the survey. The second study (Rice and others, 2022) used a different mobile device location data vendor which determined home locations similarly, using the zone improvement plan (ZIP) codes where the device most commonly appeared between 6 p.m. and 8 a.m. on weekdays and all day on weekends ("non-work hours"). When comparing counts of devices originating from ZIP codes estimated from the mobile device locations to counts of reservations made online from different ZIP codes, the authors found Pearson's correlation coefficients ranging from 0.860 to 0.995 and suggested that any differences were due to visitors who were from a different ZIP code than the one used to make the reservation (for example, reservation made by a friend or family member living in a different location).

While the two studies discussed in the above paragraph found generally high correlation, the lack of additional validating studies means that many questions about the accuracy and utility of methods for using mobile device location data for determining home locations are presently unanswered. For example, the two prior studies focused on domestic visitation at U.S. national parks, which generally have high visitation and some ground-truth data to compare. Studies at locations that are more remote or less popular might find different results. More research on the methods used to determine the home location could be beneficial, including investigating what timespan of historical mobile device data to use and how to accurately capture international visitors, since international data (that would show an international home location) are often not included in purchased datasets, or because international visitors may have different mobile device usage patterns than domestic visitors. However, many of the data vendors who provide home location data do not share their exact methodology for determining home location, making evaluation difficult. In some cases, mobile device location data is in a format that allows researchers to determine home locations themselves, eliminating issues with lack of transparency from data vendors' methods, although studies evaluating this approach with ground-truth data are lacking. Research on the methods for determining home location from digital mobility data is still in its early stages, with a very limited number of studies showing that the data have potential but should be tested and validated using survey or other ground-truth data to ensure accuracy before use.

Visitor Demographics

Social media and mobile device location data are both being researched as a source of information on the demographics of recreational visitors to public lands. Compared with research on home location estimation, however, there has been less work put towards examining the use of these data for visitor demographics, especially for social media data. We are aware of only two studies in which social media were evaluated as a measure of visitor demographics. In both studies, information from social media users who had posted content geotagged in the area of interest was used to infer their age, ethnicity, or gender. In the first study, images of people in city parks in Seattle, Washington posted to social media were analyzed by a facial recognition algorithm to classify their age (child versus adult) and ethnicity (Mashhadi and others, 2021). Compared to survey data collected at the same parks, the demographic proportions of visitors derived from images were significantly different. For example, the algorithm applied to social media images estimated fewer visitors fell in the "White" race category than did the survey results, although the authors note this could be due to inaccuracy in the algorithm or bias in the survey. Instead of using the content of visitors' photos, the second study (Liang and others, 2023) used the profile information of X (formerly Twitter) users who shared geotagged posts from Yellowstone National Park to determine demographic information. The names shared in public profiles were matched in databases that assign first names a gender and last names an ethnicity, and a facial recognition algorithm was used on user profile photographs to assign an age category. The study observed no difference from survey data for visitor gender but significant differences for age and ethnicity. The results of these studies taken together indicate that social media data, taken either from user profiles or from the content of posted photographs, is unlikely to be a reliable source of demographic data on recreational visitors. Beyond the lack of accuracy, demographic measurements—and the use of artificial intelligence or other algorithms—has ethical considerations, acknowledged by authors of both studies. Commercial algorithms are proprietary and details about them, including the datasets on which they are trained, are often not shared. Training algorithms on demographically biased data can over- or underestimate certain groups (Liang and others, 2023), and some ethnic groups may not even be defined within an algorithm, leading to misclassification (Mashhadi and others, 2021). Inaccurate predictions could create issues by classifying individuals into a group they do not identify with, and this misclassification could lead to their demographic group being misreported among visitors. Additionally, inferring gender, age, or ethnicity could be

considered unethical on principle—even if algorithms can be made to give accurate results. Finally, while social media users make their content publicly available, there are still questions and concerns about whether using it to infer demographics intrudes on users' privacy (Liang and others, 2023).

Researchers using mobile device location data to determine the demographics of recreational visitors have evaluated different methods than researchers using social media—namely, the estimated home locations of devices detected in the parks of interest. Home locations are generally determined by looking at the nighttime locations of the devices (refer to the section "Visitor Home Locations" above for more details), and then the locations are associated with population-level demographic data, usually from the U.S. Census Bureau (in the United States) or other national statistics. For example, in a study by Liang and others (2022) using a mobile device location dataset, the home census block group (CBG is a geographical unit used by the U.S. Census Bureau) was estimated for each mobile device that visited Yellowstone National Park. They used the percentages of gender, age, race, educational level, and income level of people living within each CBG to infer the demographics of visitors visiting the park from many CBGs. Compared to data from surveys conducted at the same park, there were significant differences across nearly all demographics estimated. Similarly, when Monz and others (2021) used mobile device location data to determine the home locations and demographics of visitors to county parks in California (through census demographics at the CBG level), they found differences from survey-based estimates of education level and ethnicity. The authors of these studies propose several causes of the inaccuracy of visitor demographic information obtained from mobile device location data. Since methods depend on census information from a larger scale than a single household, both outdated census data and differences between the census population and the subset of that population that are park visitors can lead to inaccuracy (Monz and others, 2021). Research shows that the demographics of park visitors do not align with the United States population as a whole; some demographics, such as people who have higher incomes, higher formal education, and are white are more likely to visit NPS units (Xiao and others, 2021). Inaccuracy in the determined home locations can also contribute to errors in the demographic estimates (Liang and others, 2022).

Research indicates that both social media and mobile device location data are unlikely to produce reliable estimates of visitor demographics in all locations and for all demographic dimensions. For both data types, more research into whether demographic data can be inferred and how to better reflect actual visitor demographics could be beneficial for management. There also remains a question of what could be considered ethical and appropriate, even if more advanced and accurate methods can be developed for determining demographics of visitors to public lands and waters. Demographic information is inherently personal, and some visitors may not be comfortable with this information being inferred without explicit consent.

Visitor Activities

The majority of research on novel methods for determining visitor activities has investigated the use of social media data, but this line of research is still developing. The studies that have been done in this area have used either manual (human) or algorithmic (computer) classification of geolocated photographs posted to social media to determine participation by activity type. For example, Heikinheimo and others (2017) used Instagram photographs geotagged to national parks in Finland to manually classify people into activity categories such as hiking and skiing. They then compared the frequencies of activities detected in the photographs to survey data and found no significant differences, although some activities that were shown in the photographs were not included in the survey. Similarly, Moreno-Llorca and others (2020) manually classified social media photographs geotagged to parks in Spain into "nature-based experience" groups, which describe the kinds of activities and experiences visitors were engaged in, then compared that to surveys of the same users. They found the correlation between the two datasets depended on both the park and the "nature-based experience" group and found significant differences. These differences, they suggest, could be in part due to the bias that visitors exhibit in determining which images to post to social media—they do not post photographs representing every activity. The contrasting results of these two studies suggest that manually classified photographs shared on social media may not reliably capture all recreational activities, and that further research could be beneficial before relying on it in practice.

A second method for determining visitor activities from photographs posted to social media was tested by Winder and others (2022), who developed a convolutional neural network model to identify activities of visitors in social media images geotagged to a national forest in Washington. Their method relied on first training a model using manually classified photographs. Once trained, the model could automatically assign activity categories to any number of other photographs. When the authors compared the numbers of visitors participating in different activities according to the machine-labeled social media images versus the results of visitor surveys, they found relatively low correlation, although this relation varied by activity type. As with the studies using manual classification, they suggest that the method's inaccuracy could be due to visitors not sharing photographs of certain activities on social media, as well as difference between the relatively narrow time window captured by the survey and the longer window of time over which photographs were posted.

Overall, research indicates that geolocated social media are potentially a source of information on visitor activities, but additional research can evaluate how to accurately capture all activity types or correct for biases in activities that are or are not often shared in photographs posted to social media. Although we did not find any studies researching the use of mobile device location data as a way to infer visitor activities, there has been some work using data from systems typically found in mobile devices, such as GPS data and accelerometers, to classify activity types, such as walking, jogging, and cycling that has the potential to be applied to mobile device location data from recreational visitors to public lands (Ellis and others, 2014; Wan and Lin, 2016; Bodhe and others, 2024).

Visitor Experiences

Out of the four visitor use metrics that have been estimated with novel data, visitor experiences have received the least amount of research. While there are a variety of ways to quantify visitor experience, the few validated studies in this area have measured the feeling of tranquility and sentiment—which generally describes visitors' subjective well-being and positive affect. Research to date has used social media as the data source; since mobile device location data only conveys information about a visitor's location over time, it is unlikely to be a source of direct data about visitor experience. Wartmann and Mackaness (2020) compared visitor ratings of tranquility for locations within a national park in Scotland to the descriptive words (known as tags) that social media users used to label their photographs of the same park. The study compared the tranquility ratings of locations based on the photograph tags with survey data collected at locations around the park and found that the datasets generally agreed, although there were some exceptions. In another study, Havinga and others (2024) also used user-generated text (tags, titles, and descriptions) associated with posted images to assess the experience of visitors to parks in England, then used three different natural language processing models to derive estimates of the sentiment visitors expressed in their text. Their comparison of sentiment derived from the photograph text versus survey responses showed significant correlations between the datasets; for example, the sentiment associated with photograph text near locations that the survey identified as being popular among visitors due to the scenery was more positive than in other locations. However, the authors caution that close attention must be paid to the choice and implementation of computer models used to assess sentiment, since these models are complex and it is not always clear which factors models use to make predictions (Havinga and others, 2024).

The content of images posted on social media can also reveal the preferences of visitors, which has an impact on their experience. For example, one study in Colorado compared the frequency of landscape features in social media images (as determined by a computer algorithm) with the stated preference for those features in visitor surveys (Wilkins and others, 2022). The authors found significant differences between the two datasets, suggesting that the content of images shared online might not be an adequate measure of visitor preferences that would lead to a positive experience.

In addition to photographs, visitors may use social media platforms to share reviews of their visits to public lands and waters. This can be a rich source of information on visitor experience, however studies validating their use are few. One study in China used sentiment analysis of reviews on two social media platforms to infer visitor satisfaction and compared those measures to survey data, finding high correlation between the two data sources (Huai and others, 2023). Other studies in the United States used reviews from the Washington Trails Association and Google Maps to infer experiential qualities of visits, but did not evaluate the methods, for instance through comparison with data collected using established survey methods (Huang and others, 2022; Derrien and others, 2023; Medlin and others, 2023).

While geolocated social media—especially photographs and their accompanying text—are potentially rich sources of information on visitor experiences, research in this area is just beginning. Along with the need to evaluate any measures of experience using ground-truth data, future work in this area could benefit from a focus on development and better understanding of algorithms used to translate social media content into concrete measures of experience.

Novel Data Assessment

This section gives an assessment of geolocated social media and mobile device location data for measuring aspects of visitor use. For a similar assessment on the use of novel data for measuring visitation (counts of visitors), refer to Hanson and others (2025).

Assessment—Geolocated Social Media Data

There are situations where geolocated social media may be used to accurately estimate different visitor use metrics, but this possibility comes with issues that must be considered, including a need to still collect some survey data for calibration and validation. Potential advantages of social media over established survey methods include reduced costs and personnel time required to collect a similar amount of data. Because surveys can be difficult to implement at locations that are remote or have many points of access, these locations could especially benefit from methods leveraging social media for measuring aspects of visitor use. Since some social media platforms make data available for free, the potential cost is limited to paying for computing and staff who have the expertise needed to collect and analyze the data. An additional potential benefit of social media is that it can provide multiple observations of visitors over time. Whereas it can be challenging to follow up with survey

respondents to gather additional data, users' social media posts can span multiple years, depending on the platform. This makes geolocated social media a potentially robust and fairly accessible source of a wide range of visitor use data.

Despite the promise of measuring visitor use with geolocated social media, there are several potential issues and considerations for visitor use monitoring. First, access to some data is restricted and there is a trend among platforms toward increased restrictions. While some social media platforms allow free access to posts and other information, many platforms now charge fees for access, decreasing the availability of these data for research (Hanson and others, 2025). Researchers and practitioners cannot assume that data that are currently accessible will remain so in the future and that the costs of accessing data will not increase (Ghermandi and others, 2023).

Second, social media data are inherently biased–only those visitors who use social media and contribute geotagged content (with accounts set to public rather than private) will be sampled–and this bias varies over time and space (Chen and others, 2021). There is bias in the demographics of who uses various social media platforms and bias in the types of content people share (Hargittai, 2018), and such biases are likely causes of the differences from survey or other ground-truth data observed in studies. This bias is a primary reason underlying the use of ground truth data from surveys and other direct observation methods to validate and calibrate any measures derived from social media, which is becoming increasingly recognized as best practice (Dagan and Wilkins, 2023; Wilkins and others, 2024). The frequency and scale of on-the-ground data required for adequate validation is an area of open research, but the potential need for at least some ongoing calibration is a consideration when designing an approach to measuring aspects of visitor use that includes the adoption of any new source of remotely collected data such as social media.

Third, obtaining and analyzing geolocated social media involves effort and expertise. A variety of technical skills are needed to download, store, and analyze the textual and image data. Hiring and training staff to perform these tasks could offset some (or all) of the cost-savings of using social media data.

Finally, there are many ethical considerations. Generally, social media are made publicly available by the users who create the content, but even in these circumstances steps such as data aggregation are used to preserve the privacy of users (Di Minin and others, 2021; Liang and others, 2023). Even if data are publicly available and could be anonymized, it does not necessarily mean all uses of the data are ethical. Official interagency guidelines on ethical use of social media and other mobility data, and maintaining visitor privacy, could help standardize use and ensure public trust is maintained.

Assessment—Mobile Device Location Data

Mobile device location data have many of the same potential benefits of geolocated social media data, as outlined in the previous section. Reliance on mobile device locations may reduce investments in intercept surveys and other onsite observational work. Because the data are generated by the visitors and collected remotely, it is potentially more cost effective than direct observation in areas that are large, hard to access, or have porous boundaries. Studies have observed that the datasets can capture a meaningful proportion of visitors to federally managed lands and waters (Hanson and others, 2025). Moreover, mobile device location data can be language agnostic (if the applications used in location data collection are available in multiple languages), meaning that visitors who may be missed by surveys because they do not speak the survey language could potentially be captured by mobile device location data. These advantages suggest that mobile device location data may be a valuable source of information for visitor use monitoring efforts, and this potential is being evaluated by an increasing amount of research (Monz and others, 2021; Liang and others, 2022; Rice and others, 2022).

However, recent research has also uncovered several drawbacks of using mobile device location data to measure visitor use. One issue is that mobile device location data represent a biased sample of users. Records only capture visitors who own a mobile device, have it with them and turned on during their visit, and use one of the apps that collects and sells location data (Hanson and others, 2025). Additionally, applications collecting location data potentially need cell service in order to transmit the information in-the-moment. Controlling for these biases is complicated by the fact that many data vendors do not share information about which or how many apps are represented in the commercially available data. This lack of transparency from vendors, who also typically do not share information on how data are processed, means that measures of visitor use have the potential to vary over time and space and may not describe the whole population of visitors (Winder and others, 2025). Research has indicated that the best practice for handling this variability currently is to calibrate and validate estimates with ground-truth data (Dagan and Wilkins, 2023; Hanson and others, 2025), although how often and at what geographic scale this is necessary is an area of open research.

Our review of the literature indicates that mobile device location may not be useful for measuring all visitor use metrics, as we found no proposed or researched methods for using location data to estimate metrics such as visitor experience. Additionally, using mobile device data to estimate visitor demographics based on home locations has to date had low accuracy, and relies on the assumption that public land visitors represent census averages, which is knowingly false (Xiao and others, 2021).

Finally, while the use of mobile-device location data does not require field staff and other support for surveys, there can be considerable costs associated with purchasing and storing the data, as well as the cost of hiring staff with the appropriate expertise to analyze large datasets.

Implementing a Method

The following sections describe tradeoffs and choices to consider when choosing a method to collect visitor use data, some best practices for visitor surveys, and challenges associated with collecting visitor use information.

Considerations When Choosing a Method to Collect Visitor Use Data

When designing a visitor use monitoring program, there are many methodological choices with tradeoffs to consider. First, there are tradeoffs associated with different survey methods, for example, comment cards, intercept surveys, online surveys, or mail surveys. To use comment cards, staff place paper survey cards in visitor centers or other high-use areas, but staff are usually not directly involved in inviting people to participate or in administering the questions. This is often the least costly option to collect data, largely because it requires the least personnel time, but it likely has bias in who decides to respond (self-selection bias). Research shows that surveys allowing people to self-select to participate often have different participant characteristics and findings when compared to a survey sample that does not allow self-selection (Vaske and others, 2025a). For example, if comment cards are near a bathroom, people may be more likely to fill one out if the bathroom was dirty and required staff attention. Additionally, multiple people per group could fill out a comment card, which would also bias the sample (because people in the same group are more likely to have similar activity participation and experiences). In some situations, comment cards could be treated more like a visitor survey, where staff randomly select visitors to receive a comment card, which could reduce the bias in this approach.

Intercept surveys can be a more reliable method for selecting a representative sample of visitors to a location. Costs to administer an intercept survey vary widely depending on the size of the population of visitors and the precision that is desired (for example, obtaining a sample representative of year-round use is much more costly than obtaining a sample only representative of peak season use). One downside of onsite intercept surveys is they do not allow for questions that would need to be asked at the end of a trip (such as total spending or satisfaction with the whole trip). This can be overcome by either opting to only survey visitors at the end of their visit or coupling an onsite intercept survey with an online or mail-back follow-up survey.

Coupling an onsite intercept survey with an online or mail follow-up has the potential to expand the number and types of questions asked, including questions that would be answered at the end of a visit. If an onsite intercept survey is already being administered, it can be fairly low cost to add a follow-up online survey. Paper mail-back surveys have substantially higher cost than online surveys due to printing costs, mailing costs, and staff time needed to manually enter data and manage mailing reminders. However, paper surveys generally have higher response rates than online surveys (Daikeler and others, 2020), which could justify the additional cost. Response rates have been declining over time for both online and mail-back surveys in general (Stedman and others, 2019; Vaske and others, 2025b), which means that an increasing number of onsite contacts are needed to obtain the desired sample size. To increase sample sizes and obtain a more representative sample, surveyors often send follow-up reminders, which requires collecting mailing addresses or email addresses from potential respondents. Visitors may be hesitant to give out their personally identifiable contact information, however, which then reduces response rates and possibly biases the sample. Further, managing personally identifying information so that it is not released to the public or attached to any survey response becomes the responsibility of the sponsoring agency.

There are also tradeoffs to consider when deciding whether to rely on surveys versus novel sources of data on visitor use. One limitation of novel data is that the sample of people who are represented is inconsistent over time. For example, mobile device location data vendors may at any time change their methods and mobile applications for determining locations, usually without notification to data users. Companies that generate mobility data could be sold or acquired (potentially affecting data availability), and social media platforms change in popularity and use over time. One of the benefits of survey programs is that agencies manage these programs and can collect consistent data over time, which can be used to analyze trends (for example, FS's NVUM has over two decades of data). This is often not possible using novel data sources. However, novel data still hold promise, particularly because they can, in some situations, reduce the staff time needed to collect data. If the issue of biased representation can be addressed, then novel data can be used in areas where it is challenging to collect visitor use data—for example, in areas that are remote, low-use, or have porous boundaries. Novel data from geolocated social media may be used as a complement to survey data by supplementing information collected in surveys (though they are still not an option to replace survey data). For example, if visitor surveys only take place during the summer, the content that people post to online platforms may be used to understand certain characteristics of visitor use at other times of the year. However, visitors' use of various social media platforms and data access can change frequently, so it is unknown whether these data could be a practical and economical source of visitor data in the future.

Different types of visitor use data may be obtained from different sources. Table 4 provides a summary of the categories of visitor use information that can be obtained from visitor surveys, administrative data, geolocated social media data, and mobile device location data. Table 5 provides a comparison across data types regarding their overall accuracy and reliability, cost, visitor burden, and technological requirements to collect data on visitor use.

There are additional tradeoffs to consider when trying to balance data representativeness and cost effectiveness (table 6). "Representativeness" of data refers to the degree to which a sample reflects the larger population of interest. Representativeness depends on the sampling design—primarily when, where, and how surveys are administered. Generally, collecting a fully representative sample of all visitors to a unit requires data collection at multiple locations and across different seasons, so the effort—and therefore the cost—required to sample a large population is greater than the survey effort needed to characterize a smaller population. If, for example, an agency was aiming to characterize visitors to all units nationwide, they could choose to sample random units each year (chosen from strata to be representative nationwide) or sample all units on a rotation over a given time frame. If all units are surveyed on a rotation, agencies could choose to do this on a 5-year rotation, 7-year rotation, 10-year rotation, and so on. A 10-year rotation of all units would have a lower annual cost than a 5-year rotation (since the number of units with surveys each year would be halved), but there would be a tradeoff in representativeness associated with only contacting visitors who are present every 10 years instead of every 5 years. Within years, an agency could choose to sample only in the peak season (such as NPS's SEM), during two seasons (FWS's NVS), or year-round (FS's NVUM); each sampling design would contact different visitors and have differing costs, with implications for accuracy of the estimate. There is not one approach that may be best for every situation and objective, and each agency has a reason for choosing different approaches. For a summary of different considerations when designing intercept survey approaches and associated tradeoffs, refer to table 6.

Survey instruments typically focus on questions that address either national- or local-scale needs. Nationally representative data and local-level data each serve different purposes. For example, national data are used for Congressional and agency-level reporting, strategic planning, developing partnerships, external communication, and allocating budgets on a large scale. Local-level data are likely used more for site-level recreation management, planning, local decision making, and NEPA reviews. Some survey questions may serve both national and local-level needs, but many may not. There may be value in having a set of survey questions that are asked the same way at each location to produce nationally representative data, while also having a set of survey questions field staff could customize based on their local data needs.

Table 4. A comparison across data types for the categories of information that can be obtained related to visitor use. The information in this table is a broad and simplified summary based on the authors' expertise and knowledge of existing research as of 2025. Further considerations of surveys and administrative data are covered in the "Implementing a Method" section while geolocated social media data and mobile device location data are discussed in the "Novel Methods" section.

Categories of visitor use information	Surveys (comment cards, intercept, online, or mail surveys)	Administrative data (such as permits, reservations)	Geolocated social media data	Mobile device location data
Home location	Yes	Yes	Yes, with varying accuracy	Yes, with varying accuracy
Other demographics (gender or sex, age, race and ethnicity)	Yes	Usually no, but could be asked	Maybe, with accuracy and ethical concerns	Maybe, with low accuracy
Trip characteristics	Yes	Some (for example, group size)	No	No
Activity participation	Yes	Yes, if permits are for specific activities	Yes, with varying accuracy	Maybe, with unknown accuracy
Visitor satisfaction, attitudes, and experiences	Yes	No	Some, with varying accuracy	No
Economic contributions	Yes	No	No	No

Table 5. A comparison across data types of accuracy and reliability, cost, visitor burden, and technological requirements that can be considered and obtained related to visitor use. The information in this table is a broad and simplified summary based on the authors' expertise and knowledge of existing research as of 2025. Further considerations of surveys and administrative data are covered in the "Implementing a Method" section while geolocated social media data and mobile device location data are discussed in the "Novel Methods" section. Abbreviations: GPS, Global Positioning System; OMB, Office of Management and Budget.

Categories of visitor use information	Surveys (comment cards, intercept, online, or mail surveys)	Administrative data (such as permits, reservations)	Geolocated social media data	Mobile device location data
Overall accuracy and reliability				
Requires validation and calibration (evaluating the accuracy and scale of the data using other datasets)	No	Depends on how the data are being used	Yes	Yes
Degree of bias (low, medium, or high)	Depends on methods; low if a random sample is obtained[1]	High, only includes visitors who need permits or reservations	Depends on location and data source(s)	Medium to high, only includes visitors using applications on mobile devices
Overall cost				
Equipment and material cost (including mailing)	Depends on methods, higher for mail-back surveys	Low	Low	Low, except for data purchase
Amount of labor hours for data collection	Medium to high[2]	Low	Medium	Low
Amount of labor hours for data processing and analysis	Depends on methods[3]	Depends, lower if permits are online; higher if data entry is required	High	Depends, high if raw data are purchased
Requires data purchase	No	No	Depends on platform	Yes
Level of training required to collect data	Low	Low	Medium to high	Low
Level of training required to analyze data	Depends on analysis needs[4]	Low	High	Depends, high if raw data are purchased
Overall visitor burden				
Requires interacting with or contacting visitors	Yes	Yes, but needed anyway for permitting	No	No
Time burden on visitors	Depends, ranging from low to high	Low	None	None
Potential for identifying information	Yes, depending on what is asked on the survey	Yes	Yes	No, if anonymized data and aggregation are used
Overall generalizability				
Method can be used at most types of sites	Yes	Yes	Yes, although data may be lacking at low use sites	Yes, although data may be lacking at low use sites
Overall technological and administrative complexity				
Currently (as of 2025) or previously used by agencies to estimate aspects of visitor use	Yes	Yes	No	No
Administrative burden	High, requires OMB approval	Low unless it requires a new OMB approval	Low	Medium, with contracting and purchasing

Table 5. A comparison across data types of accuracy and reliability, cost, visitor burden, and technological requirements that can be considered and obtained related to visitor use. The information in this table is a broad and simplified summary based on the authors' expertise and knowledge of existing research as of 2025. Further considerations of surveys and administrative data are covered in the "Implementing a Method" section while geolocated social media data and mobile device location data are discussed in the "Novel Methods" section. Abbreviations: GPS, Global Positioning System; OMB, Office of Management and Budget. —Continued

Categories of visitor use information	Surveys (comment cards, intercept, online, or mail surveys)	Administrative data (such as permits, reservations)	Geolocated social media data	Mobile device location data
Overall technological and administrative complexity—Continued				
Is the data availability predictable long term?	Yes	Yes	No	No
Requires cellular connectivity	No	No	No	Sometimes
Requires visitor-owned GPS-enabled devices	No	No	Yes	Yes

[1]Different survey methods have different degrees of bias, and some surveys may not have any bias. For example, comment cards may have self-selection bias or multiple people per group may fill out a comment card. Intercept surveys that randomly select visitors during a random sample of days have little to no bias.

[2]Labor hours are generally higher as larger sample sizes are needed. For example, an intercept survey at one location in one season would require a lower sample size and lower effort than an intercept survey at 20 locations across multiple seasons. Labor hours may also be high if a survey requires managing paper surveys and mailings.

[3]Labor hours for data processing and analysis of survey data are generally low if surveys are all done electronically and there are response options for each question. Labor hours for data processing and analysis can be high if surveys are done on paper and require manual entry or if the surveys contain many open-ended questions that require analyst review and coding.

[4]The level of training required to analyze survey data would be low if only basic frequencies and percentages for each question are needed. The level of training needed can be high if the survey data require data weighting, complex statistical analyses, or qualitative coding of open-ended data.

Table 6. Issues and options to consider for designing intercept survey methods to understand visitor use on public lands and waters and a summary of various options and tradeoffs. Abbreviations: %, percent.

Issues for intercept survey design	Options	Representativeness tradeoffs and considerations	Cost tradeoffs and considerations
Approach for selecting units or sites	Convenience sample Rotation (sampling each unit over a certain time frame) Stratified random sample	Convenience samples cannot produce data that are representative when aggregated to larger spatial scales (for example, regional or nationwide)	Lower costs for a convenience sample; cost for a rotation or stratified random sample approach depends on all the factors listed below
Number of units surveyed per year (number of years for a rotation approach)	Number of units selected annually for random or convenience samples can vary If using a rotation, could rotate through units every 3, 5, 7, or 10 years (for example)	Determines how frequently each unit gets updated local-level data; older data are likely less representative of present use, but the differences would vary from site to site	Cost increases as more units are surveyed each year (for rotations, costs increase the more frequently each unit is surveyed)
Seasonality of surveys	One season (usually peak season) Two seasons Year-round	Data collected during only one season are only representative of visitors during that season and not all visitors over a calendar year	Costs increase with the number of seasons where survey administration takes place due to greater staff effort needed
Target confidence level and margin of error	Confidence levels of 95% or 90% are most common Margins of error could range from 3% to 10%	Does not necessarily affect representativeness of a sample but does affect the uncertainty and error of the estimates	Higher costs for targeting lower margins of error and higher confidence levels, since this requires more completed surveys
Coupling intercept survey with an off-site follow-up	No follow-up survey Mail-back follow up survey Email (online) follow up survey	Representativeness tradeoffs may not be a high concern[1], but adding an off-site follow-up survey allows for asking more questions and collecting additional data	Higher costs for mail-back surveys (compared to online) due to printing, mailing, and data-entry costs
Locations to administer surveys within a unit	Main entrance areas or high-use areas only A mix of locations that receive varying levels of use Including more remote or dispersed-use areas	Surveys administered only at high-use areas would be less representative of all use within a unit	Higher costs for administering surveys in remote or low-use areas since there may be fewer completed surveys per day of effort

[1]Certain groups of people may respond to the offsite follow-up survey at lower rates than others. If this happens and is a concern, it could be controlled through data weighting.

Considerations For Designing a Survey Instrument

There are many choices to be made when designing a survey instrument, including what topics to include and how questions are phrased. Generally, survey design benefits from balancing the desire for more information with the need to keep the survey instrument short enough that most visitors who start the survey can finish it without complaint.

The questions to include on a survey instrument vary case-by-case and always depend on the purpose of the survey and how the data may be used. However, we include some reflections below on which categories of information are most common across surveys to understand aspects of visitor use on public lands and waters and how the information may be used.

- *Visitor demographics.* It is common to ask at least some demographic questions on surveys to know who is responding to the survey and how that may affect the results. Age and gender are the most common demographics asked, and other demographic questions could be added as space on the survey allows. Income and education are often highly correlated, so for most visitor use-related purposes, asking one or the other is sufficient. Information on the race and ethnicity of visitors can also be used for understanding visitor

use patterns. Demographics can also be used for weighing data since some demographics are less likely to respond to surveys and their perspectives could be underrepresented otherwise.

- *Trip characteristics.* Asking questions related to trip characteristics can increase accuracy of visitation estimates. For example, asking the number of people in the vehicle is needed to convert the number of cars to the number of people. Similarly, asking the primary purpose of a visit (for example, recreation, business, passing through) is needed to remove non-recreational visits from estimates. Other types of trip information, such as how visitors heard about a location or information sources consulted before their visit, can help managers know how to communicate with potential visitors about issues like hazards and closures.
- *Activity participation.* Most surveys benefit from asking a question about activity participation, and the EXPLORE Act requires agencies to report this information (16 U.S.C. § 8401 et seq). This is generally a quick question for visitors to respond to when the survey provides possible answers; visitors can check all that apply. It may also be helpful to ask a follow-up question on a visitor's primary activity, which is an addition that typically does not add much time to a survey.
- *Economic contributions.* Collecting visitor spending information can help agency economists calculate and communicate the economic contributions of existing public lands and waters for recreation (or the economic impacts of developing new areas, as discussed above in the "Existing Methods" section). Economic contributions (and economic impacts) include the effects of visitation on the local, regional, or national economy in terms of spending, sales, value added, tax revenues, jobs supported, or labor income earned. The economic value (or consumer surplus) of a recreation activity differs from economic contribution (or economic impact) and is a monetary measure of the benefit to an individual or group engaging in that activity. To understand the economic value for public lands and waters that provide recreation opportunities (among many other amenities), surveys may ask visitors and non-visitors questions about their use values (for example, willingness to pay for recreation) and non-use values (for example, willingness to pay for species habitat). This so-called "stated preference" approach to estimating economic value may involve gathering information on observed behavior and surveying people about their preferences (Horsch and others, 2017). There are also non-survey approaches, like analyzing data on the distance visitors travel from their home and related costs of visitation. This travel-cost method allows analysts to observe visitors' "revealed preferences" (Parsons, 2003).
- *Visitor satisfaction, attitudes, and experiences.* Information on visitor satisfaction, attitudes, and experiences can help managers identify where to invest limited resources to most improve visitor experiences. For example, questions related to crowding and congestion could provide data to support increasing parking capacity in certain locations or managing access (permits or timed entry). Questions related to attitudes and experiences depend on the management challenges of individual locations.

Once survey topics are chosen, the survey designer can consider how each question is asked, including the format and phrasing. Question formats can include multiple choice (asking the respondent to make one selection or to check all that apply), Likert scales, ranked choices, and open-ended responses. The preferred format depends on the question and what information is needed. Generally, open-ended questions can provide specific and nuanced information, but they both take visitors longer to respond to (with some respondents skipping them altogether) and require substantial staff time to read and categorize. Given that tradeoff, visitor use surveys typically have, at most, a small number of open-ended questions. For Likert-scale questions, the 5-point scale tends to be the most common for visitor survey research. Likert questions are most clear when there is a description of what every choice corresponds to (for example, strongly agree, agree, neither agree nor disagree, disagree, strongly disagree). Most often, the mid-point on the Likert scale will correspond to "neutral," such as "neither agree nor disagree," or quality of services being rated as "average." When deciding on question phrasing, it is helpful to have others review a survey instrument to see what may be unclear, to read questions aloud to see how they sound, and to check other similar survey instruments to see where wording could be made consistent. For more information on designing effective survey questions, refer to Dillman and others (2014) or Vaske (2008).

Best Practices for Visitor Surveys and Sampling Design

There are multiple books that describe best practices for survey design and implementation. Interested readers can refer to Dillman and others (2014) and Vaske (2008) for comprehensive information on all aspects of survey design and implementation. Several important best practices that could be used (summarized from Dillman and others, 2014; Vaske, 2008) include:

- Only one visitor per group should be invited to participate in a survey.

- If visitors are in a group, the person who participates should be chosen randomly (often by asking who had the most recent birthday) rather than letting the group members self-select.
- Surveys should be administered at different times of the day (morning, afternoon, and evening) and on different days of the week (to include weekdays and weekends) to obtain a representative sample.
- The survey approach should be designed to mitigate and measure non-response bias when possible (for example, sending multiple reminders to participate and including a few questions to check for non-response bias).
- Target sample sizes should be calculated before administering a survey and would inform the number of days needed to collect data.

We discuss non-response bias and calculating necessary sample sizes before beginning a survey in the following paragraphs.

Non-response bias refers to bias in survey data that arises from people who decline to participate in the survey having significantly different characteristics or experiences than people who agree to participate in the survey (Dillman and others, 2014; Vaske, 2008). For example, younger people may be less likely to respond to surveys, or people having very positive or negative experiences may be more likely to respond. Generally, concerns about non-response bias are higher when response rates are lower (Dooley and Lindner, 2003). There are multiple ways to reduce and measure non-response bias. One of the main ways to reduce non-response bias for off-site surveys is to send multiple reminders to potential participants (either through email or postal mail) (Dillman and others, 2014). With each reminder, the response rate typically increases and there is reduced concern of bias due to some people being busy or simply forgetting about the survey. Non-response bias can also emerge from potential participants being unable to participate; for example, if a survey is sent through email only and not all potential participants have reliable access to email or the internet. A best practice can be to give potential participants the option to use a paper copy of the survey with a return envelope. There is also some evidence to suggest response rates are lower for longer surveys, although other factors such as the content of the survey and complexity of the questions also affect response rates (Liu and Wronski, 2017; Rolstad and others, 2011). To ensure surveys are no longer than necessary, consider how the data from each question may be used and ensure that all questions are necessary to the survey. Finally, non-response bias can emerge if the survey design allows people to self-select to participate (for example, through comment cards or posting a link to a survey on social media); this is generally not recommended as self-selection is known to increase bias in the results (Mercer and Lau, 2023; Vaske and others, 2025a).

It is a best practice of surveys to measure non-response bias when possible so anyone using the data knows if and how the data may be biased. For onsite only surveys, if someone declines to participate in the survey, the survey administrator could follow up and ask if they would be willing to answer just a few questions. These would be just a few key questions to check for non-response bias, in other words, differences between the sample and those eligible for the survey who declined participation. Non-response bias questions could include age, gender or sex, home location, or overall satisfaction—essentially, any characteristics that may indicate biases and that researchers could compare between non-respondents and visitors who participated in the full survey. For online or paper surveys, it is common for the last contact to be a non-response bias check rather than the full survey, similarly asking potential respondents if they would be willing to answer just a few questions (Dillman and others, 2014; Vaske, 2008).

Sample size is another important aspect to understand before implementing a survey and refers to the total number of completed surveys collected at a given spatial scale of analysis (for example, across a park, forest, or refuge). It is important to determine the target sample size of a survey before implementation because the target sample size affects the number of days survey administrators need to be in the field collecting data. Sample size determines the confidence level and margin of error on survey estimates, as well as the standard deviations of numerical estimates. For example, if survey administrators are aiming for a 95 percent confidence level and 5 percent margin of error, the ideal sample size is usually between 370–385 randomly selected visitors (depending on the total population of visitors but assuming a visitor population of 10,000 or greater) (Taherdoost, 2017). Multiple websites exist to help users calculate target sample sizes using mathematical equations. This ideal sample size is why survey programs rarely aim to collect more than 400 surveys per unit, unless there is a need for the surveys to be representative at different locations within the unit. A survey with a confidence level of 95 percent and a margin of error of 5 percent is 95 percent confident that the true value for the population of all visitors is within 5 percent of the estimate based on the sampled visitors. Practically, it means that if different samples are randomly drawn from the full visitor population, the true value for the population is within the confidence interval 95 out of 100 times. If higher margins of error are acceptable for the specific data uses, lower sample sizes may be appropriate; for example, a sample size around 200 is usually sufficient for estimating at the 95 percent confidence level with a 7 percent margin of error. However, all of these scenarios require that the sample of visitors is selected randomly from the population of interest. For example, sampling 200 visitors on the same day is not a random sample if the population of interest is all annual visitors. When reporting survey results, information would be provided about

the sampling frame, sample sizes, and the sampling approach as well as general confidence levels and margins of error for the survey.

Sample sizes also provide context for why data collected at the unit-level (park, forest, or refuge) usually cannot be scaled down to be representative at the site-level (individual campgrounds or trailheads). Hypothetically, if survey administrators collected 50 completed surveys from 8 different sites within a park that are representative of all use throughout the park, they would have 400 surveys to make inferences at the park level with a low margin of error and a high confidence level. However, a sample size of 50 is not sufficient to make accurate inferences at any of the 8 individual sites—the estimate would have a margin of error of over 10 percent at a 90 percent confidence level. The same challenge exists when trying to make inferences about subgroups within the sample, for example, making inferences about local versus non-local visitors. If the total sample size is 400, but only 50 of those are from non-local visitors, specific inferences about non-local visitors would have a high margin of error. In some cases, having data even with a high margin of error can be better than having no data, but anyone making decisions based on data with small sample sizes would need to be aware of the uncertainty and limitations associated with these data.

Challenges With Collecting Visitor Use Information

Intercept surveys are the most common way agencies collect data on visitor use, but there are still various challenges associated with intercept surveys. The remote nature of some public lands and waters can make it challenging to administer visitor surveys because these locations often require significant travel time for staff and result in few completed surveys per day. Additionally, it can be difficult to get a representative sample at lower-use areas because surveyors make so few contacts with visitors per day compared to higher use areas (so more survey days are needed in low-use areas to obtain adequate sample sizes). Similarly, it can be challenging to get a large enough sample of visitors that is representative of use across all seasons, especially during the off-season, because surveyors also encounter fewer visitors per day. If obtaining data in low-use areas or low-use seasons is important for decision making, this may be where novel data sources and methods are the most beneficial and cost effective. However, the lack of cellular connectivity in some remote and low-use areas may also make using mobile device location data a challenge. Alternatively, researchers could invest some time in surveying low-use areas, but proportionally less time than high-use areas (so some visitors to low-use areas are included in the sample, but not necessarily enough to make inferences to only that subpopulation.)

There are also challenges associated with finding staff to administer surveys and ensuring the safety of survey staff. It can be difficult to find staff to conduct surveys since these jobs tend to be short-term and may require significant travel. Some agencies have their own staff administer surveys, but this can also present challenges since surveys are often administered during the peak visitor use season, when staff are busy attending to other priorities. It can be common to only have a single surveyor in the field per location to reduce cost and labor time needed, but that can create safety concerns, which may be exacerbated for women and those administering surveys in low-use or remote areas. It could be beneficial to have surveyors out in pairs in places that are low-use, remote, or do not have reliable cell phone service.

The Paperwork Reduction Act (44 U.S.C. §§ 3501–3521) process can also pose challenges to collecting timely, relevant visitor use data. It may take several years to get a survey approved following the requirements in the Paperwork Reduction Act. This may prove challenging for agencies to have timely responses to emerging data needs of public land managers and planners. To address this challenge, OMB has provided some agencies generic clearances that cover a variety of potential local-level visitor surveys (for example, OMB control number 1024-0224), and there are some generic clearances for visitor surveys that span multiple agencies (for example, OMB control number 0596-0236). If a survey falls under an already-approved generic clearance, the agency can submit the specific request to be "fast-tracked," which requires substantially less time and paperwork (Herd and others, 2023).

Once the data are collected, there are additional steps required to use samples to summarize an entire population of visitors. If, for instance, the objective is to estimate a national statistic, then survey programs first need a representative sample, which could be collected using a rotation approach where all eligible units are surveyed over a given time period (similar to FS's NVUM or FWS's NVS) or stratified sampling to select units (similar to NPS's SEM). If a stratified sampling approach is used to estimate nationwide data, the strata need to be carefully selected to represent a variety of unit types. Then, samples could be extrapolated to the national level, according to the sampling frame and accounting for issues such as non-response bias. Simply summing data across a convenience sample of sites may not produce results that are accurate summaries of all visitors nationwide.

Opportunities

This section describes potential opportunities to improve the comparability of visitor use metrics across agencies, collect visitor use data through means other than visitor intercept surveys, and invest in areas of further study, including applications of novel data and understanding how visitor use data are used in decision making. Implementing or further investigating these opportunities may enable improved understanding of visitor use that can better inform the management of Federally managed public lands and waters.

Comparability of Visitor Use Metrics

As shown in table 2, many of the same visitor use topics are asked on visitor surveys across multiple agencies, but there are some differences. Additionally, although agencies often ask similar questions, the exact wording can vary by agency. It may be beneficial to have a small set of questions that are standardized across agencies and asked on all visitor surveys. More coordination and comparability could create future opportunities for sharing data analysis, reporting costs, and infrastructure across agencies.

For instance, all agencies ask visitors for demographic information on their age, and most also ask about home location and gender or sex. These could be part of a subset of questions that are asked on all visitor surveys, with additional demographic questions asked based on agency need and survey length. All agencies ask questions related to trip characteristics, with substantial variation in the questions asked—this may also be a place where having a few standardized questions could be useful. The most common trip characteristics asked are trip duration, primary reason for visiting, primary destination, and number of visits within the last 12 months.

The EXPLORE Act directs agencies to establish categories of recreation activities to be reported consistently (16 U.S.C. 8442 (a)). We discussed the benefits of standardizing some activity categories across agencies in our prior report (Hanson and others, 2025). Appendix 1, table 1.1 provides a summary of which activities each agency currently tracks. In addition, all agencies ask visitor satisfaction questions related to recreational facilities and recreational opportunities, and these have historically been used to gauge progress towards agency goals related to providing positive visitor experiences, but the questions can differ across agencies. If there is a desire to compare visitor satisfaction rates across sites or agencies, or to report overall visitor satisfaction across an agency, it could be helpful to ask a few standardized visitor satisfaction questions. The EXPLORE Act also directs agencies to develop objectives and quantifiable targets for increasing visits to Federal land by members of the Armed Forces, veterans, and Gold Star Family members (16 U.S.C. § 8504). Agencies do not currently survey visitors for information about military and veteran status but may consider including standard survey questions to better understand visitor use by these groups.

Visitor Use Data Collection

To date, most visitor use data has been collected through visitor intercept surveys, as discussed in the "Existing Methods to Collect Visitor Use Data" section. Although visitor intercept surveys are a well-established method to collect visitor use data on a wide variety of topics, other methods to collect additional or complementary data could be explored. For example, agencies could better leverage data collected through Recreation.gov when visitors reserve campgrounds, permits, or entry reservations. Agency staff could also work with Recreation.gov staff to approve and send users online surveys after their visits in certain instances when additional visitor use data are necessary. Outfitters and guides may also be able to collect and provide details on visitor use (although this would only represent visitors who use those services, and these data may not be perceived as useful if they are not collected consistently). Additionally, some agencies have developed mobile phone applications for visitors to use for visitor information (for example, the National Park Service application or "app"), and there may be an opportunity to collect visitor use data through these existing apps (although the data would only be representative of the visitors who use those apps).

Leveraging entrance fee data and pass sales (for example, pass users for 4th graders, military, access, senior citizens) to collect additional visitor use information could be considered. For example, visitors could be asked for basic demographic information when they obtain or buy a pass. Additionally, the EXPLORE Act requires Federal agencies to establish digital passes that can be stored on a mobile device, (16 U.S.C. § 6804 (a)(10)), which could present additional opportunities to collect visitor data. Finally, for public lands that sell transponders, there may be an opportunity to collect visitor use data during transponder sales and renewals, although those data would likely only reflect local visitors.

Areas for Further Study

Apart from surveys, there is a small body of research on methods to collect visitor use data such as trip characteristics, visitor demographics, visitor spending, visitor satisfaction, visitor experiences, and visitor preferences. Studies investigating the following topics could be particularly beneficial to inform the field of practice:

- Testing the use of novel data such as social media data and mobile device location data to measure visitor demographics, home locations, activities, and experiences (through comparisons with ground-truth data),
- Evaluating the relative costs of novel data sources (such as understanding cases when novel data sources might be more cost effective than established data collection methods),
- Exploring visitors' perceptions of, and preferences for, how land managers obtain information on visitor use (including privacy concerns and how visitors perceive different types of visitor use data being derived from novel data sources),
- Understanding aspects of visitor use in low-use areas where surveys are not feasible or cost effective, potentially using novel data sources,

- Measuring the effects of management actions on visitor use (for instance, visitor satisfaction, trip characteristics, visitor demographics), and
- Improving cost-effective sampling for visitor surveys (for example, sample frame and stratification).

In addition, an improved understanding of how visitor use data are used in decision making could help agencies collect data that can be more practical and relevant. This could be achieved through collecting case studies or surveying staff at various levels (for example, site manager, regional director, or director) within Federal land and water management agencies. Reviewing methods used by other Federal agencies for developing similar visitor use metrics could also be insightful. For example, researchers at the U.S. Census Bureau released a report on using mobile phone location data in official statistics (Nichols and others, 2023), which could help other agencies working with this data source. Agencies could develop new perspectives on improving visitor use monitoring by reviewing topics such as how other agencies monitor customer demographics, customer satisfaction, visitor experiences, and preferences.

Legislative Activity

Recent legislative activity regarding monitoring recreation has primarily focused on visitation data (summarized by Hanson and others, 2025), with indirect attention toward other aspects of visitor use data including trip characteristics, visitor demographics, visitor spending, visitor satisfaction, visitor experiences, and visitor preferences (refer to appendix 2, table 2.1). The EXPLORE Act (Public Law 118–234), which was passed into law in January 2025, codified many of the visitor use data concepts echoed in legislation from the 117th and 118th U.S. Congresses. In addition to its explicit provisions to improve Federal land and water management agencies' visitation data, the EXPLORE Act may improve other elements of visitor use data through provisions that direct Federal land and water management agencies to establish categories of recreation activities reported consistently across agencies "to identify needs and economic impacts [of recreation] in gateway communities," to develop objectives and quantifiable targets for increasing visits to Federal land by certain populations (such as youth and veterans), and to estimate the use of special recreation permits serving certain types of communities (U.S. Congress, 2025, p. 24). The establishment of consistent categories for Federal reporting on recreation activities can facilitate comparison and aggregation of data across agencies, which could improve understanding trip characteristics and visitor preferences at the local, regional, and national levels. Research to identify economic impacts of recreation on gateway communities may lead to more comprehensive information about visitor spending and the influence of visitor spending on gateway community employment and income. Developing and monitoring visitation targets for specific population sectors (such as youth and veterans) and estimating certain communities' use of special recreation permits is likely to require improved data collection about visitor demographics.

Conclusion

Visitor use data are used for effective resource planning. In addition to visitation data (the total number of visitors in any place over a particular time), visitor use data can include other aspects such as visitor demographics, trip characteristics, activity participation, visitor satisfaction, visitor attitudes and experiences, and economic contributions of visits. Several pieces of legislation, including the EXPLORE Act (passed in 2025), call for agencies that manage Federal lands and waters to report data on visitor use. The aim of this report is to summarize current visitor use monitoring methods on Federal lands and waters, as well as the state of research into new methods and data sources that could be used to develop visitor use metrics. Since agencies have varying purposes and uses of visitor use data, there is variability between agencies in terms of which data are collected, and the methods used to collect it. Our review of current research shows that novel data such as social media and mobile device location data have the potential to provide some visitor use information, but come with many caveats, including ethical concerns. Our findings outline how robust visitor use data can be used and the challenges of developing consistent, ethical, and reliable approaches across agencies. Continuing to develop these methods can help improve agencies' ability to manage public resources and enhance the experiences of recreation visitors on Federal lands and waters.

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Appendix 1. Recreational Activities Monitored

For a summary of recreational activities that are monitored at two or more Federal agencies, refer to table 1.1.

Table 1.1. Activities that are monitored across multiple Federal agencies (reproduced from Hanson and others, 2025).

[Only categories monitored by at least two Federal agencies are listed in this table. How these activities are monitored varies by agency. Data for activity monitoring comes from the following sources: Dena Williams (U.S. Army Corps of Engineers [Corps], written commun., 2024) for the Corps; Greg Wolfgang (Bureau of Land Management [BLM], written commun., 2024) for the BLM; Ronnie Baca (Bureau of Reclamation [Reclamation], oral commun., 2024) for the Reclamation; U.S. Fish and Wildlife Service (FWS; 2021) and Andrew Don Carlos (FWS, written commun., 2024) for the FWS; U.S. Forest Service (FS; 2023) for FS; Danielle Schwarzmann (National Oceanic and Atmospheric Administration [NOAA], written commun., 2024) for the NOAA Office of National Marine Sanctuaries (ONMS); Otak, Inc. and others (2024) for the National Park Service (NPS). "No" indicates activity is not monitored by this agency; "Yes" indicates activity is monitored by this agency]

Activity type	Corps	BLM[1]	Reclamation	FWS	FS	NOAA ONMS[2]	NPS
Backpacking	No	Yes	No	No	Yes	Yes	No
Biking (general)	Yes	No	Yes	Yes	Yes	Yes	No
Biking (mountain)	No	Yes	No	No	No	No	Yes
Biking (road)	No	Yes	No	No	No	No	Yes
Boating (motorized)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boating (non-motorized)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Camping (general)	No	Yes	Yes	No	No	No	No
Camping (developed)	Yes	No	No	No	Yes	Yes	No
Camping (primitive)	No	No	No	No	Yes	Yes	No
Climbing	No	Yes	No	No	No	No	Yes
Creative arts (photography, drawing, painting, and others)	No	Yes	Yes	Yes	No	Yes	Yes
Driving for pleasure	No	Yes	No	Yes	Yes	Yes	Yes
Environmental education	No	Yes	Yes	Yes	No	Yes	No
Field sports (for example, frisbee or throwing a ball)	Yes	No	Yes	No	No	Yes	No
Fishing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hiking or walking	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Horseback riding	No	Yes	Yes	No	Yes	Yes	Yes
Hunting[3]	No	Yes	Yes	Yes	Yes	No	No
Motorized trail activity	No	Yes	Yes	No	Yes	No	No
Nature study	No	Yes	No	No	Yes	No	No
Off-highway vehicle (OHV) use	No	Yes	Yes	No	Yes	No	No
Picnicking	Yes	Yes	No	Yes	Yes	Yes	Yes
Relaxing	No	No	No	No	Yes	Yes	No
Resort or spa use	No	No	No	No	Yes	Yes	No
Running or jogging[4]	No	Yes	No	Yes	No	Yes	Yes
Skiing (cross-country)	Yes	Yes	No	No	Yes	No	No
Skiing (downhill)	No	Yes	No	No	Yes	No	No
Snowmobiling	No	Yes	No	No	Yes	No	No
Special events	Yes	Yes	Yes	Yes	No	Yes	Yes
Viewing night skies or astronomy[5]	No	Yes	No	No	No	No	Yes
Viewing scenery or natural features (sightseeing)	Yes	Yes	No	No	Yes	Yes	Yes
Viewing wildlife	No	Yes	Yes	Yes	Yes	Yes	Yes
Visiting cultural or historic sites	No	Yes	Yes	No	Yes	Yes	Yes
Water play or sports (for example, swimming, snorkeling)	Yes	Yes	Yes	No	No	Yes	Yes

[1]The BLM monitors many activities that other agencies do not, including but not limited to the following: archery, boat launching, caving, dog mushing, dog trials, geocaching, hang gliding or parasailing, heli-skiing, high-speed time trials, hot springs or soaking, ice climbing, ice skating, interpretive programs, land or sand sailing, model airplane or rocket, orienteering, pack trips, racing, re-enactment events or tours, recreation inquiry, rockhounding or mineral collection, skating (roller or inline), skijoring, snow play (general), snowboarding, snowshoeing, spectator sports, staging or comfort stop, target shooting, therapeutic programs, trapping, motorcycle trials, vending or services, and windsurfing. The BLM also has subcategories for many of the categories listed in this table (for example, different types of OHV use).

[2]The NOAA ONMS includes many other categories on their visitor survey, and many subcategories for water activities. For example, subcategories under the "water activities" category include swimming at beaches, swimming in outdoor pools, swimming with dolphins, surfing, and windsurfing. The NOAA ONMS also has many subcategories under visiting cultural or historic sites, for example, visiting culturally significant landscapes, visiting burial sites, visiting ancestors, visiting archeological sites, and attending heritage events.

[3]The BLM splits hunting into six groups: big game, other, predator, small game, upland bird, and waterfowl. The FWS splits hunting into four groups: waterfowl hunting, other migratory bird hunting, upland game hunting, and big game hunting.

[4]Some agencies (BLM, Reclamation) combine running with hiking or walking while other agencies (NPS, FWS) separate them.

[5]The NOAA ONMS does not have "viewing night skies or astronomy" as an activity option on visitor surveys as of 2024 but is planning to add this option in the future.

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Appendix 2. Relevant Legislation

Table 2.1 contains legislative text that addresses visitor use data for Federal lands and waters, as excerpted from legislation introduced during the 117th, 118th, and 119th United States Congresses, through July 2025.

Table 2.1. Legislative activity relating to visitor use during the 117th U.S. Congress (January 2021–January 2023), 118th U.S. Congress (January 2023–January 2025), and 119th Congress (January 2025–July 2025).

Timing	Title	Relevant text
119th Congress (Legislation introduced July 22, 2025)	Protecting America's Treasures by Raising Inflow from Overseas Tourists (PATRIOT) Parks Act (H.R. 4604; U.S. House of Representatives, 2025 p. 2)	*Section. 2. Surcharge for international visitors to units of the National Park System.* "(a) Entrance fee surcharge.—Section 803(e) of the Federal Lands Recreation Enhancement Act (16 U.S.C. 6802(e)) is amended by adding at the end the following: "(3) ENTRANCE FEE SURCHARGE FOR INTERNATIONAL VISITORS.— "(A) DEFINITION OF INTERNATIONAL VISITOR.—In this paragraph, the term 'international visitor' means a nonimmigrant individual admitted into the United States under— "(i) section 101(a)(15)(B) of the Immigration and Nationality Act (8 U.S.C. 1101(a)(15)(B)); or "(ii) section 217 of the Immigration and Nationality Act (8 U.S.C. 1187). "(B) ENTRANCE FEE SURCHARGE.— "(i) IN GENERAL.—Except as provided in subparagraph (C), for any unit of the National Park System for which an entrance fee is charged, the Secretary may, at the election of the Secretary, or shall, on request of the superintendent of the applicable unit of the National Park System, authorize the superintendent of the applicable unit of the National Park System to establish for any international visitors charged the entrance fee a surcharge in an amount established by the superintendent of the applicable unit of the National Park System, by regulation, to be collected by the Secretary in accordance with this paragraph. "(ii) DETERMINATION OF SURCHARGE AMOUNT.—In establishing the amount of a surcharge under clause (i), the superintendent of the applicable unit of the National Park System shall ensure that the amount maximizes revenue for the applicable unit of the National Park System while retaining international visitation at the applicable unit of the National Park System."

Table 2.1. Legislative activity relating to visitor use during the 117th U.S. Congress (January 2021–January 2023), 118th U.S. Congress (January 2023–January 2025), and 119th Congress (January 2025–July 2025).—Continued

Timing	Title	Relevant text
119th Congress (Legislation introduced May 1, 2025)	Review and Evaluation of Strategies for Equitable Reservations for Visitor Experiences (RESERVE) Federal Land Act (S. 1575; U.S. Senate, 2025, p. 3)	*Section 3. National academy of sciences study of Federal reservation systems for recreational activities on Federal land.* "(a) Study.— (1) IN GENERAL.—The Secretaries, acting jointly, shall, not later than 60 days after the date of enactment of this Act, enter into an agreement with the National Academy of Sciences to carry out a study of Federal reservation systems for recreational activities on Federal land. (2) REQUIREMENTS.—In carrying out the study under paragraph (1), the National Academy of Sciences shall consult with the Secretaries to carry out the following: (A) A review of the history of Federal reservation systems, such as recreation.gov, including a review of— (i) the considerations, including data, that led to the establishment of the applicable Federal reservation system; (ii) the iterations of the applicable Federal reservation system over time to meet the needs of the applicable Federal agency; (iii) any visitor feedback provided with respect to the applicable Federal reservation system; and (iv) scientific literature or studies examining the efficacy of Federal reservation systems, including user preferences with respect to Federal reservation system design and implementation. (B) Based on available data and existing research, answer the following questions (i) What are the benefits and challenges of implementing Federal reservation systems to achieve management goals for Federal land, including resource protection, enjoyable visitor experiences, and sustainable operations and facility use? (ii) What data are available, and what additional data are needed, to understand demand for recreation on Federal land? How can the data be used to balance visitor management and conservation goals? (iii) What information is available regarding Federal land users and Federal reservation system users? What information is available or needs to be collected regarding demographics and characteristics of successful and unsuccessful applicants using the Federal reservation systems? (iv) Do Federal reservation systems pose a barrier for certain communities, including international communities, and user groups to access appropriate recreation opportunities on Federal land? If so, what is the nature of any barriers identified? (v) What best practices should be considered in Federal reservation system design, including visitation management system options and booking windows, options to respond to the needs specific to individual Federal land management units, and equitable access to recreational activities? What metrics can be used to record outcomes of Federal reservation system design? (vi) How have fees been collected for Federal reservation systems over time to meet the needs of the applicable Federal agency? How are the revenues from fees for Federal reservation systems split between, and spent by, Federal land units, Federal agencies, and third-party contractors? How is the fee structure disseminated to users? How could dissemination of information with respect to the fee structure be improved? (vii) What are the odds of success with respect to securing a reservation under Federal reservation systems? How are the odds of success disseminated to users? How could dissemination of information with respect to the odds of success be improved? (viii) How are data, including data collected by contractors, on Federal reservation systems shared with Federal land managers, researchers, and the public? How can transparency be improved to inform the decision making of users of Federal reservation systems? (ix) How are Federal reservation systems incorporating and adapting to emerging technologies, such as geofencing, bots, or third-party websites monitoring and reselling reservations? Are Federal reservation systems resilient to cyber threats? (x) How can Federal reservation systems be improved to reduce "no shows" and ensure that recreation sites are being used during periods of high demand? Would an increase in first-come, first-served opportunities increase equitable access to outdoor recreation on Federal land? (b) Report.—The agreement entered into under subsection (a)(1) shall include a requirement that, not later than 18 months after the date on which the agreement is entered into, the National Academy of Sciences shall submit to the appropriate committees of Congress a report that describes the results of the study carried out under that subsection."

Table 2.1. Legislative activity relating to visitor use during the 117th U.S. Congress (January 2021–January 2023), 118th U.S. Congress (January 2023–January 2025), and 119th Congress (January 2025–July 2025).—Continued

Timing	Title	Relevant text
118th Congress (Legislation became law January 4, 2025)	Expanding Public Lands Outdoor Recreation Experiences (EXPLORE) Act (Public Law 118–234; U.S. Congress, 2025)	*Section 131. Gateway communities.* "(a) Assessment of impacts and needs in gateway communities.—The Secretaries— (1) shall collaborate with State and local governments, Indian Tribes, housing authorities, applicable trade associations, nonprofit organizations, private entities, and other relevant stakeholders to identify needs and economic impacts in gateway communities, including— (A) housing shortages; (B) demands on existing municipal infrastructure; (C) accommodation and management of sustainable visitation; and (D) the expansion and diversification of visitor experiences by bolstering the visitation at— (i) existing developed locations that are underutilized on nearby Federal recreational lands and waters that are suitable for developing, expanding, or enhancing recreation use, as identified by the Secretaries; or (ii) existing developed and suitable lesser-known recreation sites, as identified under section 5(b)(1)(B), on nearby land managed by a State agency or a local agency…" *Section. 132. Improved recreation visitation data.* "(a) Consistent Visitation Data. — (1) Annual visitation data.—The Secretaries shall establish a single visitation data reporting system to report accurate annual visitation data, in a consistent manner, for— (A) each unit of Federal recreational lands and waters; and (B) land held in trust for an Indian Tribe, on request of the Indian Tribe. (2) Categories of use. —Within the visitation data reporting system established under paragraph (1), the Secretaries shall— (A) establish multiple categories of different recreation activities that are reported consistently across agencies; and (B) provide an estimate of the number of visitors for each applicable category established under subparagraph (A) for each unit of Federal recreational lands and waters..." *Section 133. Monitoring for improved recreation decision making.* "(a) In general.—The Secretaries shall seek to capture comprehensive recreation use data to better understand and inform decision making by the Secretaries. (b) Pilot protocols.—Not later than 1 year after the date of the enactment of this title, and after public notice and comment, the Secretaries shall establish pilot protocols at not fewer than 10 land management units under the jurisdiction of each of the Secretaries to model recreation use patterns (including low-use recreation activities and dispersed recreation activities) that may not be effectively measured by existing general and opportunistic survey and monitoring protocols." *Section 224. National strategy for military and veteran recreation.* "(a) Strategy.—Not later than 1 year after the date of the enactment of this title, the Federal Interagency Council on Outdoor Recreation established under section 113 shall develop and make public a strategy to increase visits to Federal recreational lands and waters by members of the Armed Forces, veterans, and Gold Star Family members. (b) Requirements.—A strategy developed under subsection (a)— (1) shall— (A) establish objectives and quantifiable targets for increasing visits to Federal recreational lands and waters by members of the Armed Forces, veterans, and Gold Star Family members; (B) include an opportunity for public notice and comment; (C) emphasize increased recreation opportunities on Federal recreational lands and waters for members of the Armed Forces, veterans, and Gold Star Family members; and (D) provide the anticipated costs to achieve the objectives and meet the targets established under subparagraph (A)…" *Section 231. Increasing youth recreation visits to Federal land.* "(a) Strategy.—Not later than 2 years after the date of the enactment of this title, the Secretaries, acting jointly, shall develop and make public a strategy to increase the number of youth recreation visits to Federal recreational lands and waters. (b) Requirements.—A strategy developed under subsection (a)— (1) shall— (A) emphasize increased recreation opportunities on Federal recreational lands and waters for underserved youth; (B) establish objectives and quantifiable targets for increasing youth recreation visits; and (C) provide the anticipated costs to achieve the objectives and meet the targets established under subparagraph (B); and (2) shall not establish any preference between similar recreation facilitated by noncommercial or commercial entities..."

Table 2.1. Legislative activity relating to visitor use during the 117th U.S. Congress (January 2021–January 2023), 118th U.S. Congress (January 2023–January 2025), and 119th Congress (January 2025–July 2025).—Continued

Timing	Title	Relevant text
118th Congress (Legislation became law January 4, 2025)—Continued	Expanding Public Lands Outdoor Recreation Experiences (EXPLORE) Act (Public Law 118–234; U.S. Congress, 2025)—Continued	*Section 353. Interagency report on special recreation permits for underserved communities.* "(a) Covered community defined.—In this section, the term "covered community" means a rural or urban community, including an Indian Tribe, that is— (1) low-income or underserved; and (2) has been underrepresented in outdoor recreation opportunities on Federal recreational lands and waters. (b) Report.—Not later than 3 years after the date of the enactment of this title, the Secretaries, acting jointly, shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Natural Resources of the House of Representatives a report that describes— (1) the estimated use of special recreation permits serving covered communities; (2) examples of special recreation permits, partnerships, cooperative agreements, or other arrangements providing access to Federal recreational lands and waters for covered communities; (3) other ways covered communities are engaging on Federal recreational lands and waters, including through stewardship and conservation projects or activities; (4) any barriers for existing or prospective recreation service providers and holders of commercial use authorizations operating within or serving a covered community; and (5) any recommendations to facilitate and increase permitted access to Federal recreational lands and waters for covered communities."
118th Congress (S. 4451 introduced June 4, 2024; H.R. 101602 introduced November 18, 2024)	Review and Evaluation of Strategies for Equitable Reservations for Visitor Experiences (RESERVE) Federal Land Act (H.R. 10162; U.S. House of Representatives, 2024, p. 3; S. 4451; U.S. Senate, 2024 p. 3)	*Section 3, National academy of sciences study of Federal reservation systems for recreational activities on Federal land* is the same as Section 3 of the 119th Congress' version of the RESERVE Federal Land Act.
118th Congress (Legislation introduced November 19, 2023)	Military and Veterans in Parks (MVP) Act (H.R. 6342; U.S. House of Representatives, 2023, p. 23)	*Section 204, National Strategy for Military and Veteran Recreation,* is the same as Section 223 of the EXPLORE Act, except EXPLORE calls on the FICOR to establish the strategy while the MVP Act calls more narrowly on the Secretaries of Interior and Agriculture.
118th Congress (Legislation introduced April 27, 2023)	Recreation for All Act (S. 1385; U.S. Senate, 2023a, p. 3)	*Section 2. Increasing youth recreation visits to Federal land.* "(a) Strategy.—Not later than 1 year after the date of enactment of this Act, and not less frequently than once every 5 years thereafter, the Secretary of the Interior and the Secretary of Agriculture (referred to in this Act as the "Secretaries") shall develop and make public a national strategy, after public notice and comment, to increase the number of youth recreation visits to Federal land. (b) Requirements.—A strategy developed under subsection (a)— (1) shall— (A) emphasize increased recreation opportunities on Federal land for underserved youth; (B) establish objectives and quantifiable targets for increasing youth recreation visits; and (C) provide the anticipated costs to achieve the objectives and meet the targets established under subparagraph (B); and (2) shall not establish any preference between similar recreation facilitated by noncommercial or commercial entities. (c) Agreements.—The Secretaries may enter into contracts or cost-share agreements (including contracts or agreements for the acquisition of vehicles) to carry out this section." *Section 3, Monitoring for improved recreation decision making,* is the same as Section 133 of the EXPLORE Act.
118th Congress (Legislation introduced March 16, 2023)	America's Outdoor Recreation Act of 2023 (S. 873; U.S. Senate, 2023b, p. 63)	*Section 133(b), Gateway communities,* is generally the same as Section 131(a) of the EXPLORE Act. *Section 144(a) Improved recreation visitation data* is the same as Section 132(a) of the EXPLORE Act. *Section 145, Monitoring for improved recreation decision making,* is the same as Section 133a-b of the EXPLORE Act. *Section 147, Increasing youth visits to Federal land,* is the same as Section 2 of the Recreation for All Act. *Section 327, Interagency report on special recreation permits for underserved communities*, is generally the same as Section 353 of the EXPLORE Act.

Table 2.1. Legislative activity relating to visitor use during the 117th U.S. Congress (January 2021–January 2023), 118th U.S. Congress (January 2023–January 2025), and 119th Congress (January 2025–July 2025).—Continued

Timing	Title	Relevant text
118th Congress (S. 390 introduced February 13, 2023; H.R. 3200 introduced May 10, 2023)	Gateway Community and Recreation Enhancement Act (S. 390; U.S. Senate, 2023c, p. 5; H.R. 3200; U.S. House of Representatives, 2023b, p. 6)	*Section 3, Gateway communities,* is generally the same as Section 131 of the EXPLORE Act. *Section 4(a,) Improved recreation visitation data,*[1] is the same as Section 132(a) of the EXPLORE Act.
117th Congress (Legislation introduced February 1, 2022)	Gateway Community and Recreation Enhancement Act (S. 3551; U.S. Senate, 2022, p. 2)	*Section 4, Gateway community partnerships.* "Using existing funds available to the Secretaries, the Secretaries shall— (1) collaborate with State and local governments, Tribal governments, housing authorities, applicable trade associations, nonprofit organizations, and other relevant stakeholders— (A) to improve the understanding of the economic impacts of visitation on gateway communities..."
117th Congress (Legislation introduced November 18, 2021)	America's Outdoor Recreation Act of 2022 (S.3266; U.S. Senate, 2021a, p. 5)	*Section 102. Planning and Managing for Recreation* "…(c) Inventory and assessment.— (1) IN GENERAL.—In developing or revising a land management plan, the Secretary concerned shall conduct, using public outreach, an inventory and assessment of recreation resources for the Federal land subject to the land management plan. (2) UNIQUE RECREATION VALUES.—An inventory and assessment conducted under paragraph (1) shall recognize— (A) any unique recreation values and uses of each landscape that make a landscape, or a portion of a landscape, desirable for a particular type of recreation opportunity; and (B) points of concentrated use by recreationists. (3) INVENTORY.—The inventory under paragraph (1) shall identify and list recreation resources by— (A) type of recreation and type of natural or manmade recreation infrastructure; (B) to the extent available, the level and demographics of use of the recreation resource as of the date of the inventory; and (C) any trend relating to recreation opportunities or use. (4) ASSESSMENT.—For any recreation resource inventoried under paragraph (1), the Secretary concerned shall assess— (A) the level of demand for the recreation resource; (B) the maintenance needs of, and expenses necessary to administer, the recreation resource; (C) the benefits of current and projected future recreation use, including to the local economy; (D) the impacts of current and projected future recreation use on— (i) natural, cultural, and other resources; and (ii) other authorized uses and activities on the Federal land subject to the land management plan; and (E) the suitability for developing, expanding, or enhancing the recreation resource…" *Section 203. Improved Recreation Visitation Data.* "(a) .—The Secretaries shall establish a single visitation data management and modeling system for public recreation to provide accurate, real-time visitation data, at a site-specific level and in a consistent manner… (f) .—To the maximum extent practicable, the Secretaries shall categorize the data collected under subsection (a) by recreational activity…."
117th Congress (Legislation introduced May 25, 2021)	Recreation Not Red Tape Act (H.R. 3527; U.S. House of Representatives, 2021, p. 41; S.1874; U.S. Senate 2021b, p. 41)	*Section 302. Recreation Performance Metrics.* "(a) In general.—The Chief of the Forest Service and the Director of the Bureau of Land Management shall evaluate land managers under their jurisdiction based on the achievement of applicable agency recreational and tourism metrics as described in applicable land management plans. (b) Metrics.— (1) IN GENERAL.—The metrics used to evaluate recreation and tourism outcomes shall ensure— (A) the advancement of recreation and tourism goals; and (B) the ability of the land manager to enhance the outdoor experience of the visitor. (2) INCLUSIONS.—The metrics referred to paragraph (1) shall include— (A) the extent of positive economic impacts; (B) visitation by families; (C) the number of visiting school and youth groups; (D) the number of available recreational opportunities; (E) the quality of visitor experience; (F) the number of recreational and environmental educational programs offered; (G) visitor satisfaction; and (H) the maintenance and expansion of existing recreation infrastructure."

[1]Note this section is Section 5 in H.R. 3200 (text is the same).

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