



Oregon State
University



Visitor Use Management Fact Sheet

Visitor Use Monitoring Resources & Case Studies

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Interagency Visitor Use Management Council

- <https://visitorusemanagement.nps.gov/VUM/Framework>
 - A link to the Council's framework and guidebooks, including:
 - **Visitor Use Management Framework:** Guidance for the full framework.
 - **Monitoring Guidebook:** Guidance for developing and implementing visitor use monitoring.
 - **Visitor Capacity Guidebook:** Tools for managing the amount and type of visitor use.
 - Contributed Papers:
 - The relationship between amount of visitor use and environmental impact, David Cole
 - The relationship between amount of visitor use and social impacts, Stewart Allen
 - Impacts to wildlife: Managing visitors and resources to protect wildlife, Jeffery Marion
 - Overview of the Interagency Visitor Use Management Framework and the Uses of Social Science in its Implementation in the National Park Service, Kerri Cahill, Rachel Collins, Susan McPartland, Aleksandra Pitt, and Rose Verbos
 - Embracing the Public Participation Process for Developing Desired Conditions: Building Relationships for Actionable Knowledge, Christopher Armatas, Lee Cerveny, Kalani Quiocho, José Sánchez, Kristen Mya Leong, Casandra Johnson Gaither, Grace Bottitta-Williamson, Daniel Williams, and Danielle Schwarzmann.
 - **Desired Conditions Guidebook:** Guidance for developing desired conditions.
 - IVUMC Trainings & Webinars: <https://visitorusemanagement.nps.gov/VUM/Traininggov>
 - Courses in:
 - Introduction to Visitor Use Management
 - The Sliding Scale
 - Building the Foundation
 - Defining visitor use management direction
 - Identifying management solutions
 - Implementing, monitoring, evaluating, and adjusting

Visitor Use Management Framework

Tools

- The Society of Outdoor Recreation Professionals (SORP) Visitor Use Management Community: <https://www.recpro.org/communities/community-home?CommunityKey=908aef90-9359-44de-bcf3-01888e95c711>
- National Park Service Congestion Toolkit https://www.nps.gov/orgs/1548/upload/Congestion_Management_2021-508.pdf

Examples

Golden Gate National Recreation Area:

- A detailed description of the process of designing a visitor use monitoring program at GGNRA
- Visitor use monitoring protocols for indicators at GGNRA
- <https://calparks.sharepoint.com/:u:/r/sites/VisitorUseManagementToolkit/SitePages/Visitor-Use-Monitoring-at-Golden-Gate-National-Recreation-Area.aspx?csf=1&web=1&e=pMXkU8>

Costal Zone Visitor Use Management

- A Story Map detailing the VUM project in the costal area of the Los Padres National Forest
- <https://storymaps.arcgis.com/stories/6cc7fa5bd7304c3888a19154030abb13>

Big Basin Redwoods State Park

- Visitor use monitoring at a California State Park
- <https://calparks.sharepoint.com/:u:/r/sites/VisitorUseManagementToolkit/SitePages/Visitor-Use-Monitoring-at-Big-Basin-Redwoods-State-Park.aspx?csf=1&web=1&e=trK66V>

Yosemite National Park

- Visitor Access Plan using the VUM framework
- <https://www.nps.gov/maps/stories/yosemite-national-park.html>

U.S. Forest Service, National Visitor Use Monitoring Program

- <https://www.fs.usda.gov/about-agency/nvum>
- References & Tools: <https://www.fs.usda.gov/about-agency/nvum/manager-tools>

Designing a Monitoring Program

Reynolds, J. H., Knutson, M. G., Newman, K. B., Silverman, E. D., & Thompson, W. L. (2016). A road map for designing and implementing a biological monitoring program. *Environmental Monitoring and Assessment*, 188, 1-25
<https://doi.org/10.1007/s10661-016-5397-x>

Data Management

Borer, E. T., Seabloom, E. W., Jones, M. B., & Schildhauer, M. (2009). Some Simple Guidelines for Effective Data Management. *Bulletin of the Ecological Society of America* 90, 205-214.

<https://www.jstor.org/stable/bullecosociamer.90.2.205>

Borman, K. W., & Woo, K. H. (2018). Data Organization in Spreadsheets. *The American Statistician* 72, 2-10.

<https://doi.org/10.1080/00031305.2017.1375989>

McCord, S. E., Webb, N. P., Van Zee, J. W., Burnett, S. H., Christensen, E. M., Courtright, E. M.,..... & Tweedie, C. (2021). Provoking a Cultural Shift in Data Quality. *BioScience* 71, 17-28. <https://doi.org/10.1093/biosci/biab020>

Data Collection

Survey123

- One option for an electronic data collection form, which can help to reduce errors in data collection.
- Available from Esri
- Tutorial: <https://learn.arcgis.com/en/projects/get-started-with-arcgis-survey123/>
 - This tutorial covers creating a survey, completing the survey, analyzing survey data, and sharing survey data with an interactive map.

Data Analysis

- R Statistical Software [R: The R Project for Statistical Computing \(r-project.org\)](https://www.r-project.org/)
- Georeferencing Strava Global Heatmap [methods-estimating-trail-use.pdf \(headwaterseconomics.org\)](https://www.headwaterseconomics.org/methods-estimating-trail-use.pdf)

Mobile Device Data & Big Data

- Baird, T., Stinger, P., Cole, E., & Collins, R. (2022). Mobile Device Data for Parks and Public Lands Transportation Planning: A Framework for Evaluation and Applications. *Transportation Research Record*, 2676(8), 490–500. <https://doi.org/10.1177/03611981221083911>
- Creany, N., Monz, C., D'Antonio, A., Sisneros-Kidd, A., Wilkins, E., Nesbitt, J., & Mitrovich, M. (2021). Estimating trail use and visitor spatial distribution using mobile device data: An example from the nature reserve of orange county, California USA. *Environmental Challenges*, 4, 100171. <https://doi.org/10.1016/j.envc.2021.100171>
- Dagan, D. T., & Wilkins, E. J. (2023). What is “big data” and how should we use it? The role of large datasets, secondary data, and associated analysis techniques in outdoor recreation research. *Journal of Outdoor Recreation and Tourism*, 100668. <https://doi.org/10.1016/j.jort.2023.100668>
- Liang, Y., Yin, J., Pan, B., Lin, M. S., Miller, L., Taff, B. D., & Chi, G. (2022). Assessing the validity of mobile device data for estimating visitor demographics and visitation patterns in Yellowstone National Park. *Journal of Environmental Management*, 317, 115410. <https://doi.org/10.1016/j.jenvman.2022.115410>
- McKittrick, M. K., Schuurman, N., & Crooks, V. A. (2022). Collecting, analyzing, and visualizing location-based social media data: Review of methods in GIS-social media analysis. *GeoJournal*, 88(1), 1035–1057. <https://doi.org/10.1007/s10708-022-10584-w>
- Rice, W., Mueller, J. T., Graefe, A., & DerrickTaff. (2019). Detailing an Approach for Cost-Effective Visitor-Use Monitoring Using Crowdsourced Activity Data. *Journal of Park and Recreation Administration*, 37(2), 144–155. <https://doi.org/10.18666/JPRA-2019-8998>
- Schirck-Matthews, A., Hochmair, H., & Paulus, G. (2023). Comparison of reported outdoor activities in Florida State Parks among three fitness tracker apps. *Journal of Leisure Research*, 54(1), 46–71. <https://doi.org/10.1080/00222216.2022.2153097>
- Whitney, P., Rice, W. L., Sage, J., Thomsen, J. M., Wheeler, I., Freimund, W., & Bigart, E. (2023). Developments in big data for park management: A review of mobile phone location data for visitor use management. *Landscape Research*, 1–19. <https://doi.org/10.1080/01426397.2023.2198762>
- Venter, Z. S., Gundersen, V., Scott, S. L., & Barton, D. N. (2023). Bias and precision of crowdsourced recreational activity data from Strava. *Landscape and Urban Planning*, 232, 104686. <https://doi.org/10.1016/j.landurbplan.2023.104686>

Visitor Surveys

Survey Research and Analysis: Applications in Parks, Recreation and Human Dimensions

- Vaske, J. J. 2008. Venture Publishing. [Google Books link](#).

Writing Survey Questions

- Pew Research Center: <https://www.pewresearch.org/our-methods/u-s-surveys/writing-survey-questions/>
- Hyman & Sierra (2016): https://www.researchgate.net/publication/282250020_Guidelines_for_writing_good_survey_questions

Pool of Known Questions (NPS)

- A collection of common survey questions and formats
- <https://omb.report/icr/202308-1024-003>

U.S. Fish and Wildlife Service, National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

- <https://www.fws.gov/program/national-survey-fishing-hunting-and-wildlife-associated-recreation-fhwar>

Electronic Survey Platforms

- Survey123: <https://doc.arcgis.com/en/survey123/get-started/whatisurvey123.htm>
- Qualtrics: <https://www.qualtrics.com/>

Trail Counters

TRAFx Trail Counter Manual

- https://www.trafx.net/downloads/TRAFx_Manual_Part_I.pdf?v=220121
- https://www.trafx.net/downloads/TRAFx_Infrared_Trail_Counter_Instructions.pdf?v=210922

Chatbot Example

Lia, E. H., Derrien, M. M., Winder, S. G., White, E. M., & Wood, S. A. (2023). A text-messaging chatbox to support outdoor recreation monitoring through community science. *Digital Geography and Society* 5: 100059.

<https://doi.org/10.1016/j.diggeo.2023.100059>

Dogs in Parks

Bekoff, M., & Meaney, C. A. (1997). Interactions among dogs, people, and the environment in Boulder, Colorado: A case study. *Anthrozoos*, 10, 23-31.

https://www.wellbeingintlstudiesrepository.org/cgi/viewcontent.cgi?article=1010&context=acwp_ca

Jorgensen, J. G., & Bomberger Brown, M. (2014). Piping Plovers *Charadrius melodus* and dogs: Compliance with and attitudes toward a leash law on public beaches at Lake McConaughy, Nebraska, USA. *Water Study Group Bulletin*, 121, 7-12. <https://ternandplover.unl.edu/download/publication/Jorgensen-Brown-2014-Piping-Plovers-Dogs.pdf>

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https://webappsprod.bouldercolorado.gov/openspace/research-reports/docs/Vaske_Jerry_Visitor_Tolerances_and_Standards_for_OffLeash_dogs_2007-1-201307161213.pdf