



Measuring Visitor Use & Attendance

Workshop 3

December 11, 2023

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Oregon State
University





Overview

- Why Collect Visitor Use/Attendance Data
- Methods & Sampling
- Visitor Use Data Examples
- Discussion & Questions



Why Collect Attendance Data?





Photo: Madeline Aberg

Why collect attendance data?

- System-wide priorities
- Resource allocation
- Visitor use management

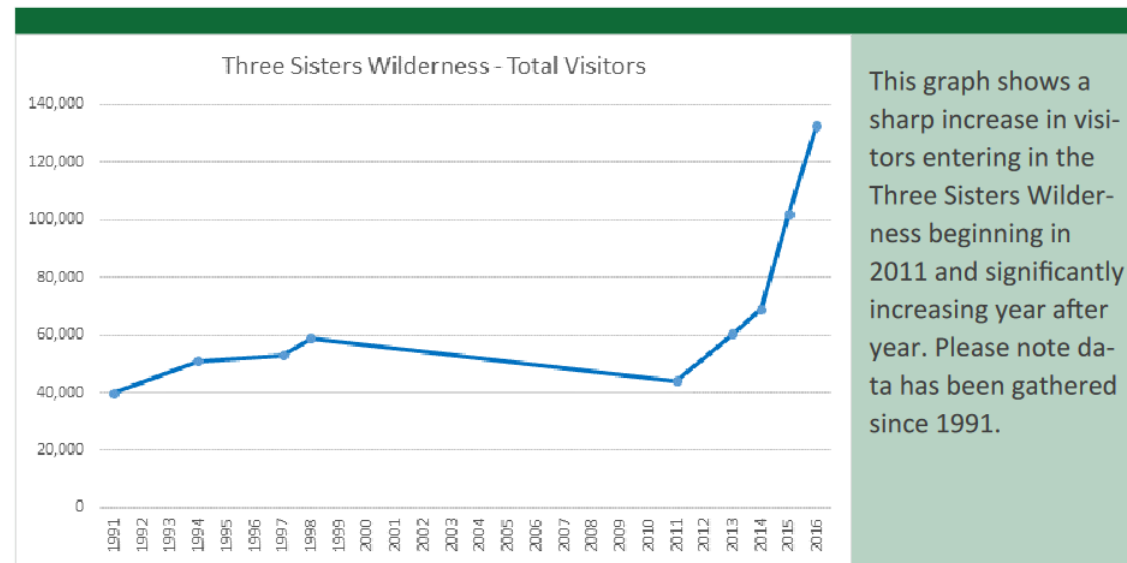
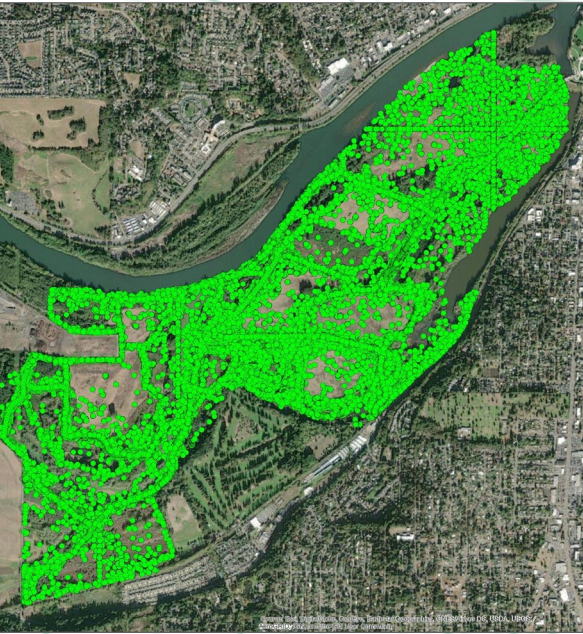




Photo: Troy Hall



Raw mobile device data for an urban park in Salem, Oregon

Credit: Ashley D'Antonio

Why collect attendance data?

- Calibrating or interpreting other measures
 - Big data (e.g., mobile device data)
 - Representativeness of visitor surveys

When are attendance data not needed?

- When you can convincingly establish there is a problem (e.g., visitor safety, capacity)



Photo: William Sullivan, *Eugene Weekly*



When are attendance data not needed?

- When you can convincingly establish there is a problem (e.g., some resource impacts)



Parking along the shoulder of SR 1 near the parks contributes to traffic congestion



Photo: Willamette National Forest



Data Collection Methods



Data Collection

- 1 Reservations & Fees
- 2 Vehicle & Trail Counters
- 3 Parking Lot Counts
- 4 Big Data



Photo: Troy Hall



Data Collection

1 Reservations & Fees

2 Vehicle & Trail Counters

3 Parking Lot Counts

4 Big Data

} need
calibration
/
validation



Photo: Ashley D'Antonio



Photo: Madeline Aberg



Reservations & Fees

- Advantages
 - Accurate data
 - Useful for correlational analyses
- Considerations
 - May capture only a portion of the user base
 - No-show rates for reservations



GOLD BLUFFS BEACH DAY-USE & FERN CANYON TRAILHEAD RESERVATIONS

Explore a stunning two-story canyon covered in ferns and the coastal bluffs of Gold Bluffs Beach!



Vehicle & Trail Counters

- Advantages
 - 24/7 counts
 - Useful for correlational analyses
- Considerations
 - Where do they work?
 - What gets counted?
 - Vandalism
- What about cameras?



Observation-based Counts

- Types
 - Entries
 - Vehicles at one time
 - People at one time
 - Encounters



Photo: Madeline Aberg



Observation-based Counts

Type	Purpose
Entries	Total use (attendance)
People/vehicles at one time	Capacity utilization
Encounters	Visitor experience





Observation-based Counts

- Considerations
 - Where do they work?
 - Cost & effort
 - What resolution is needed?



Sampling

- Not an issue for fees, counters
- Important for observational methods
 - Amount of data
 - Representativeness of data
 - Ancillary data

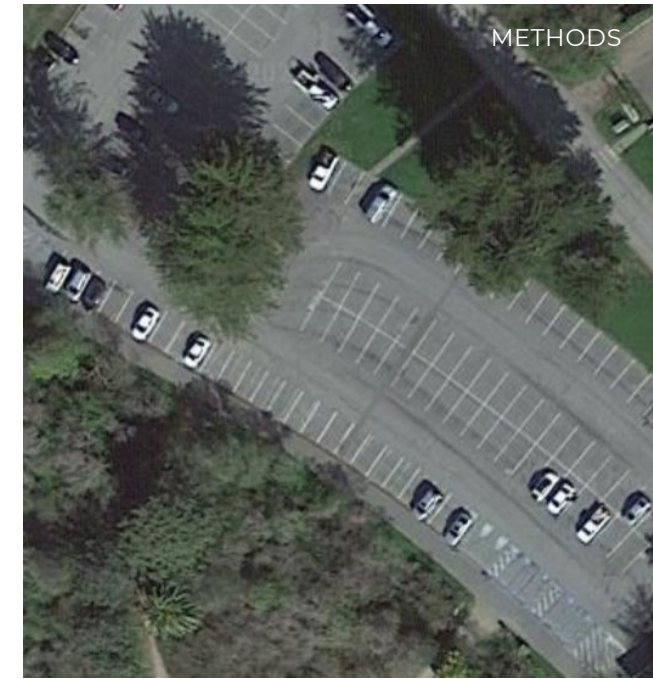


Photo: Madeline Aberg





Sampling strategies

- Focus on peak times
- Consider a pilot effort
- Document dates/times of convenience samples



Examples





Visitor Use Data Examples

- 1 Why are data needed?
- 2 What types of data were (could be) collected?
- 3 Data collection strategy



Fern Canyon, Prairie Creek Redwoods SP

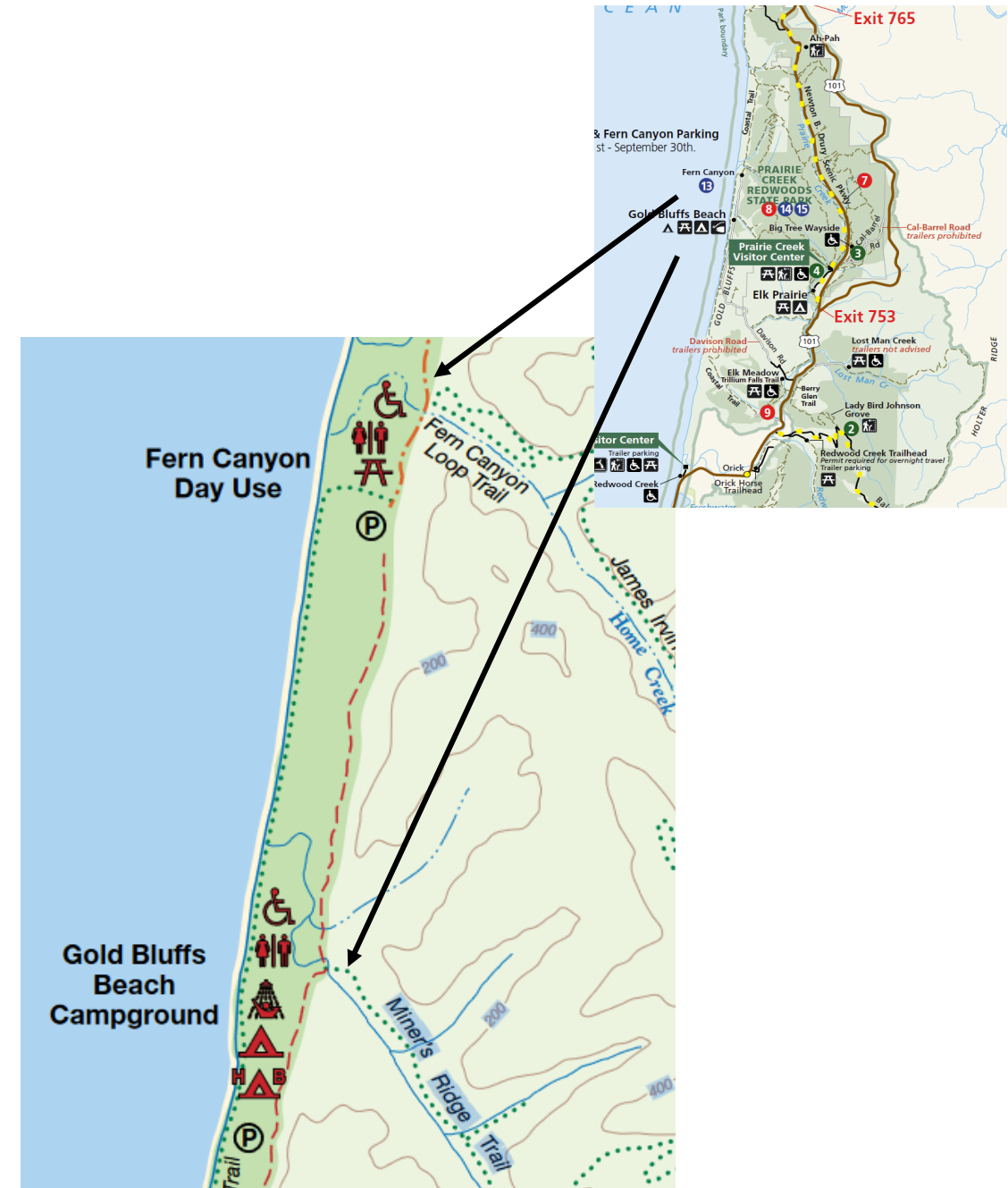
- Visitor use levels → resource and safety issues
- Data needed to for a reservation system



Photo: public domain

Fern Canyon, Prairie Creek Redwoods SP

- Relatively “simple” system
- Attendance & capacity informed reservation system
- Reservations resulted in decrease in SAR & injuries





Fern Canyon, Prairie Creek Redwoods SP

- Parking lot turnover rate could help refine permit system
- A survey could provide information on length of stay to inform reservation system

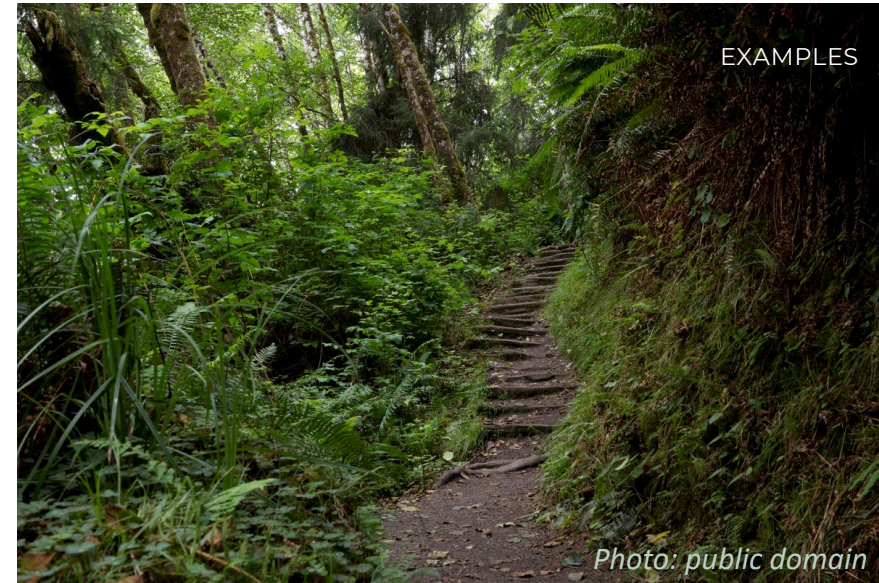


Photo: public domain



Photo: californiabeaches.com



State Beaches

- Attendance data are needed
- Considerable unpaid visitor access





State Beaches

- Mobile device data may be problematic
- Trail counters work for some entrances, not all



State Beaches

- Potential to make counts on beaches (PAOT)
- Potential to use cameras & correlate with on-site instantaneous counts



Torrey Pines State Park

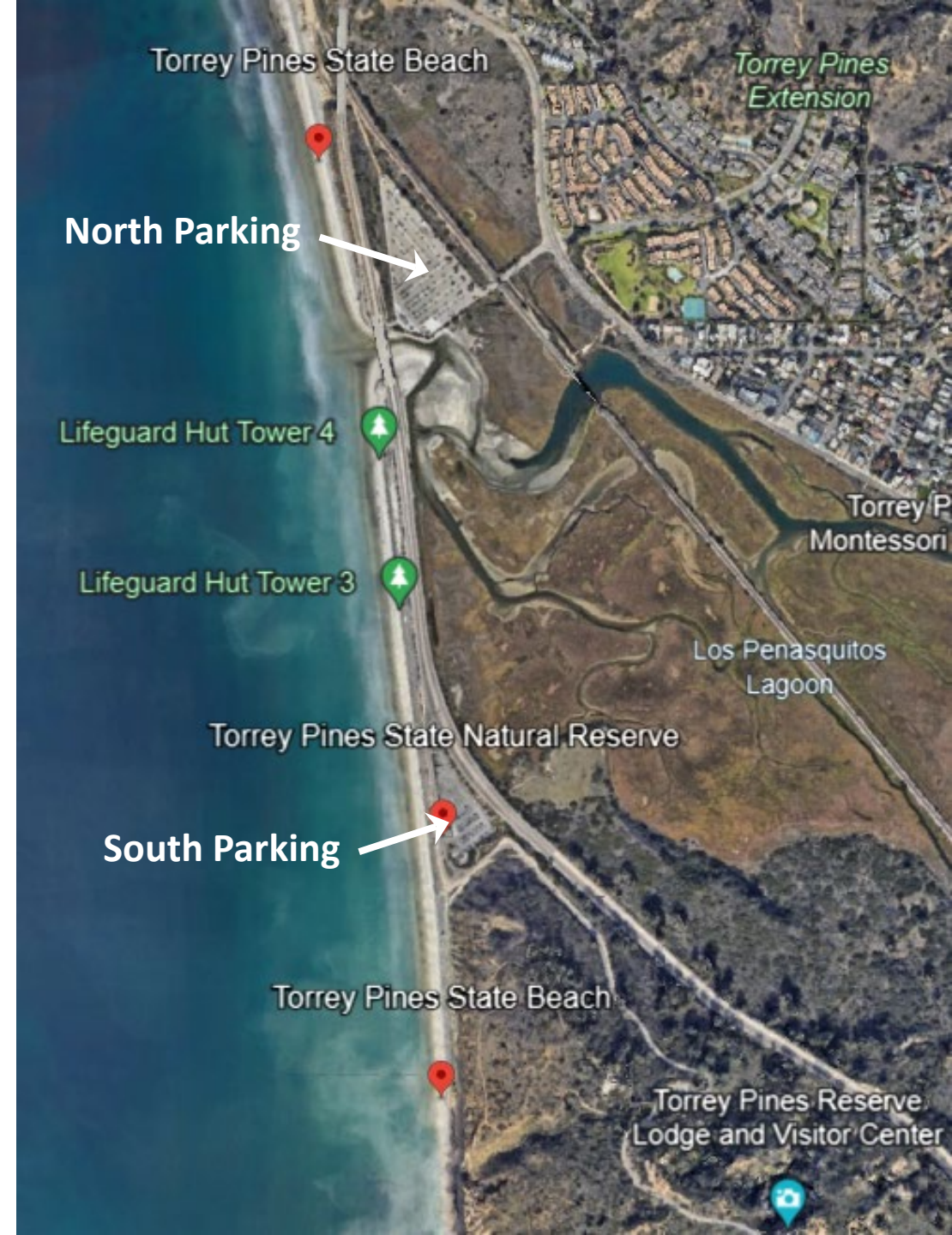
- Need for accurate counts
- Need to separate beach and Natural Area use
- Large amount of unpaid use





Torrey Pines State Park

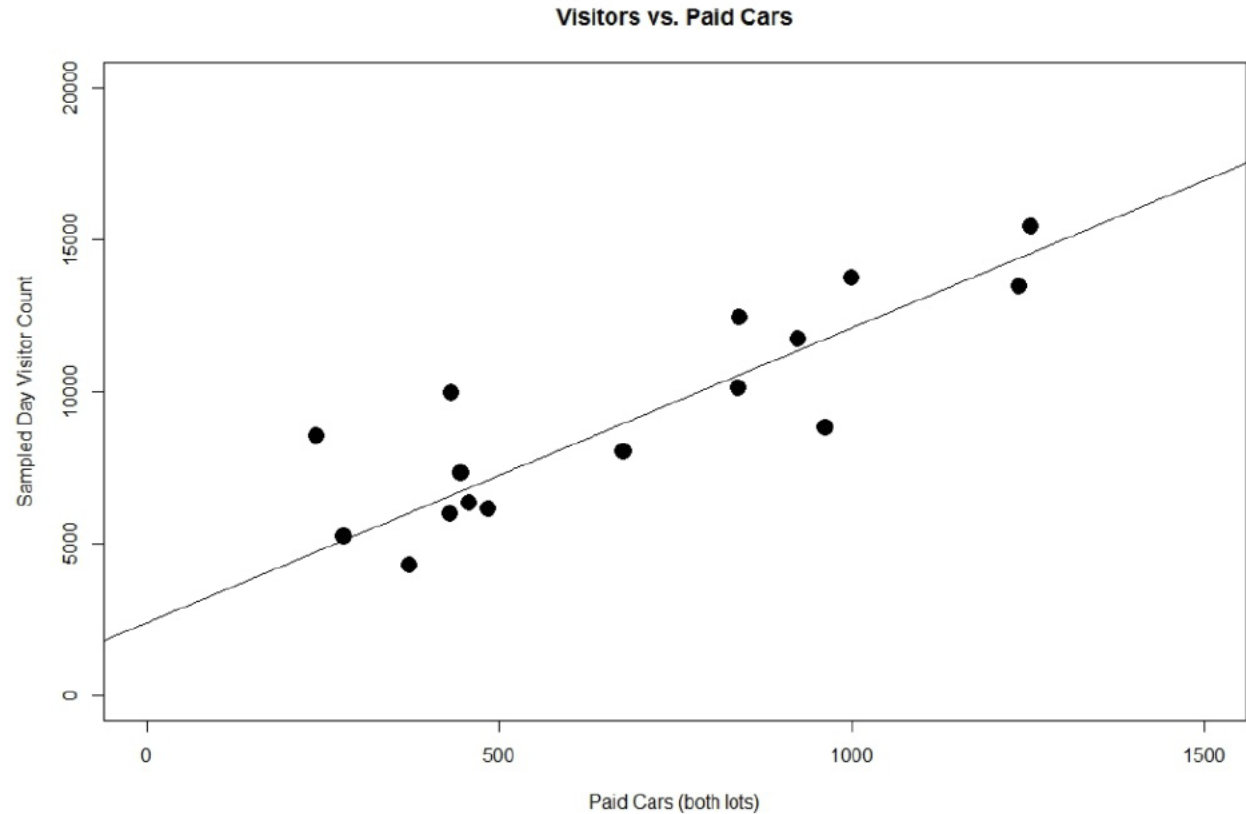
- Correlational approach
 - Paid vehicles estimated from sum of North and South Parking Lots
 - Counts at lodge
 - Volunteers collected 16 days of count (observational) data





Torrey Pines SNR

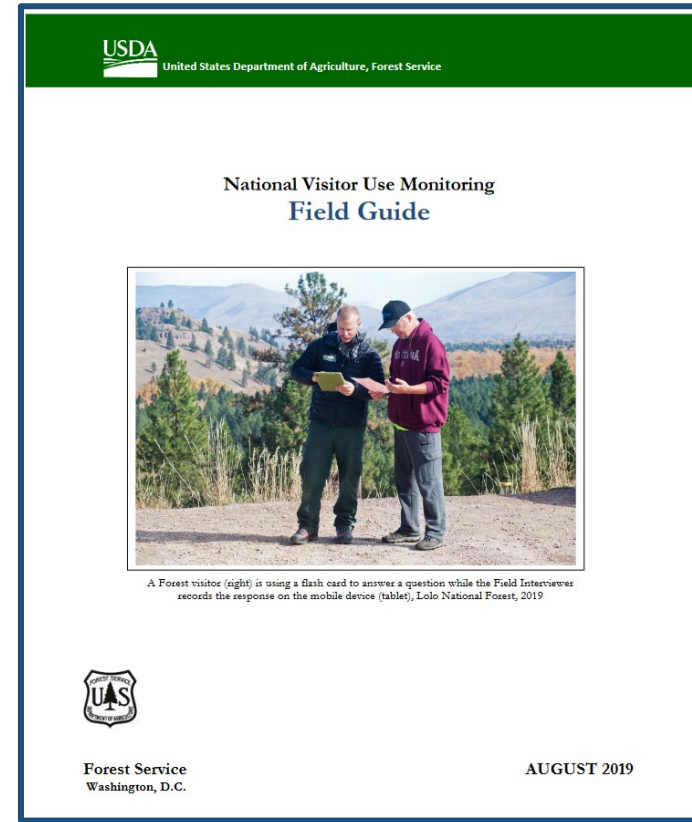
- Electronic counters did not work well
- Lodge counts did not improve correlation
- Very strong relationship between paid use and counts
- 59% of visitors are non-paid





USFS National Visitor Use Monitoring

- System-wide data
 - 4 site types
 - 5 use level strata
- 20% of forests per year
 - Pair observations & survey



Q1: Would you be willing to take a few minutes to participate in this interview?

YES (they agree to be interviewed) → GO TO Q2.

NO → (they do not agree to be interviewed) say "Thank you for your time." Then, on the digital form select YES, interview has been completed. Select the plus button to populate a new interview form. Wait until the next forest visitor agrees to be interviewed then select the next type of interview form to use, insert the time of day and hand tally count. The introduction script above will appear then to start the interview.

Q2. I need to select just one of you to complete this interview. Which of you had the most recent birthday and is 16 years of age or older?

What is your home zip code? Fill in the 5-digit zip code or if the visitor does not know or is from another country fill in the appropriate oval.



Community Science



- Example: Chatbot
 - Remote areas
 - Lower use levels
- Great for:
 - Parking lot counts
 - Some survey questions

Help your Forest!

Let us know how many vehicles are in the parking lot right now



1. Count the cars in the lot and overflow, including yours
2. Type the total number in a text and send to **505-555-555**
3. No service? No problem! Send it when you have cell service

By sending this info, you will aid a research project on the Dingford Creek Trail by the University of Washington and the Mount Baker Snoqualmie National Forest.

This data will be used to help understand the popularity of trails which is key to improving your experience.

Your contribution is anonymous and voluntary. Thanks in advance for your help and contribution to this community science project!



For more information on the research please visit: <https://www.outdoorrd.org/> or contact Emmi Lia (emmilia@uw.edu)

2021

https://outdoorrd.org/community/visitorscount/vic_pro/



Digital Geography 5 (2023) 100059

Contents lists available at [ScienceDirect](#)

 **Digital Geography and Society** 

journal homepage: www.sciencedirect.com/journal/digital-geography-and-society

A text-messaging chatbot to support outdoor recreation monitoring through community science

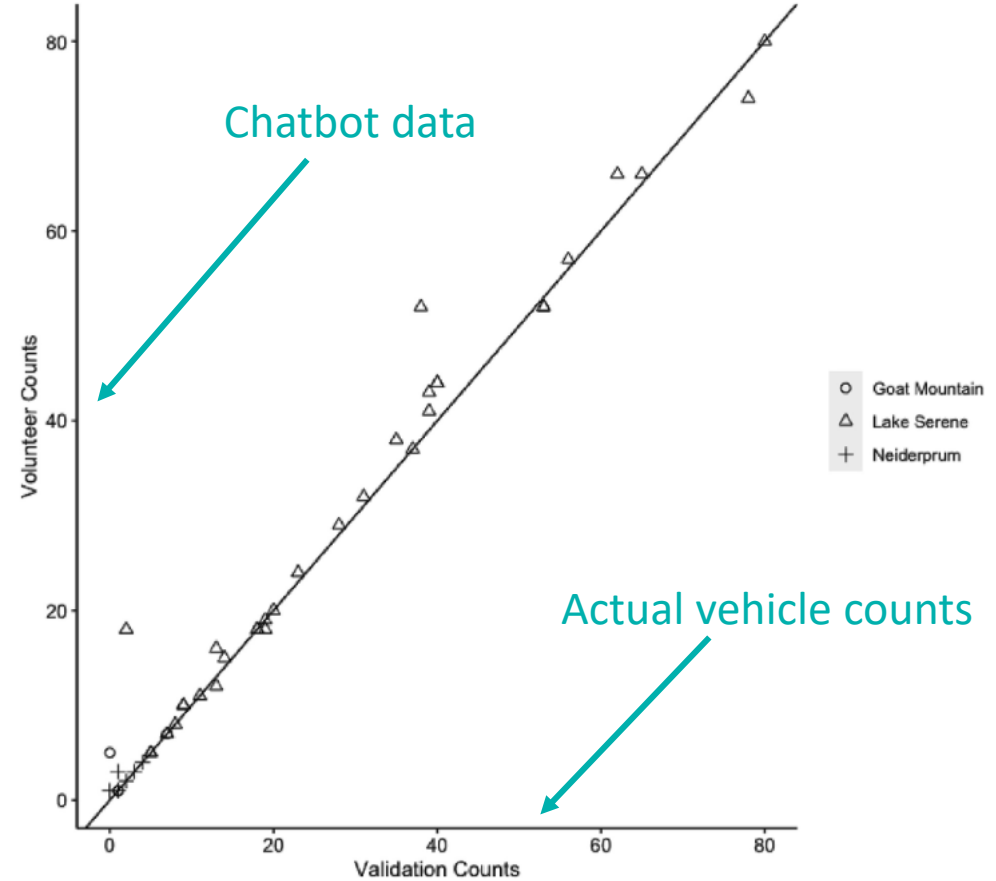
Emilia H. Lia^{a,*}, Monika M. Derrien^b, Samantha G. Winder^a, Eric M. White^d, Spencer A. Wood^{a,c}

- 14 trailheads in Mt. Baker-Snoqualmie National Forest
 - range of use levels, parking lot sizes, cell coverage, and proximity to towns and cities
- Paired counts & chatbot-survey



SMS Chatbot questions & response rates

Question ID	Full question	Response rate
Vehicle count	How many vehicles are in the parking lot right now? (Hook question on sign)	100%
Count time	What time did you count vehicles?	88%
Party size	How many people (adults and children) are in your party today?	81%
Party vehicles	How many vehicles did your party bring to the trailhead today?	79%
In vs. Out	Are you leaving for your hike, or returning from your hike?	77%
Trail visits	How many times have you visited this trail in the last 12 months, including today?	76%
Info source	How did you get information about this trail site?	74%
How long	How long did you spend on this trail? (Only asked to volunteers who responded "returning" to question "In vs. Out")	73%
ZIP code	What is your home ZIP code? (Only asked to new volunteers)	68%
Year born	In what year were you born? (Only asked to new volunteers)	28%



Help BRMBA!
Tell us about your bike!






1. Text **503-713-6850** a short description of your bike or snap a photo (bike only, no people please!)
2. No service? No problem! Send it when you have cell service

By sending this info, you will aid a research project on the Black Rock Mountain Biking Area (BRMBA) by the University of Washington, Oregon State University, and the Oregon Department of Forestry.


This data will be used to help understand how visitors are riding these trails which is key to improving your experience.

Your contribution is anonymous and voluntary. Thanks in advance for your help and contribution to this community science project!

For more information on the research please visit: <https://www.outdoorrd.org> 2021
or contact Sama Winder (sgwinder@uw.edu)

Help BRMBA!
Let us know how many vehicles are in the parking lot right now





1. Count the cars in the lot and overflow, including yours
2. Text the total number to **503-713-6270**
3. No service? No problem! Send it when you have cell service

By sending this info, you will aid a research project on the Black Rock Mountain Biking Area (BRMBA) by the University of Washington, Oregon State University, and the Oregon Department of Forestry.

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or contact Sama Winder (sgwinder@uw.edu)

Credit: Ashley D'Antonio

Data Management & Analysis





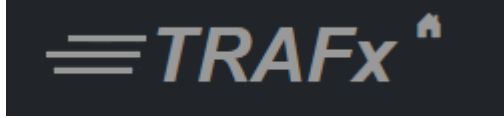
Photo: National Park Service



Photo: Ashley Spratt/USFWS

Data Analysis & Management

- Data management plan
 - Consider in advance
 - Cautions about combining data types
- Analysis can be straightforward
 - Excel
 - Software provided



UPLOAD **MANAGE** **ADMIN** **DataNet Manual**

Analyze

To create a chart or report, follow the three easy steps below. [Learn more](#)

Step 1 Select site(s)

<input type="checkbox"/> BBRSP Cool Trail	<input type="checkbox"/> Aliso & Wood Canyon	<input type="checkbox"/> BRMBA Banzai	<input type="checkbox"/> Irvine Ranch Open Space	<input type="checkbox"/> Paintbrush	<input type="checkbox"/> Run Around Do
<input type="checkbox"/> BBRSP North Escape Rd	<input type="checkbox"/> Badger Creek	<input type="checkbox"/> BRMBA Base	<input type="checkbox"/> Moro Backcountry	<input type="checkbox"/> Peters Canyon	<input type="checkbox"/> SE String
<input type="checkbox"/> BBRSP RDO	<input type="checkbox"/> Banzai_2	<input type="checkbox"/> BRMBA Brake Check	<input type="checkbox"/> NE Shore String	<input type="checkbox"/> Portage	<input type="checkbox"/> Second Beach
<input type="checkbox"/> BBRSP Redwood Loop	<input type="checkbox"/> Black Star Canyon	<input type="checkbox"/> BRMBA Slickstar Gear	<input type="checkbox"/> New South String	<input type="checkbox"/> Ridge Park	<input type="checkbox"/> Second Beach
<input type="checkbox"/> BRMBA Run Around	<input type="checkbox"/> Bommer Canyon	<input type="checkbox"/> High Frame	<input type="checkbox"/> New Nature Center	<input type="checkbox"/> Run Around Backup	<input type="checkbox"/> Top of the Work

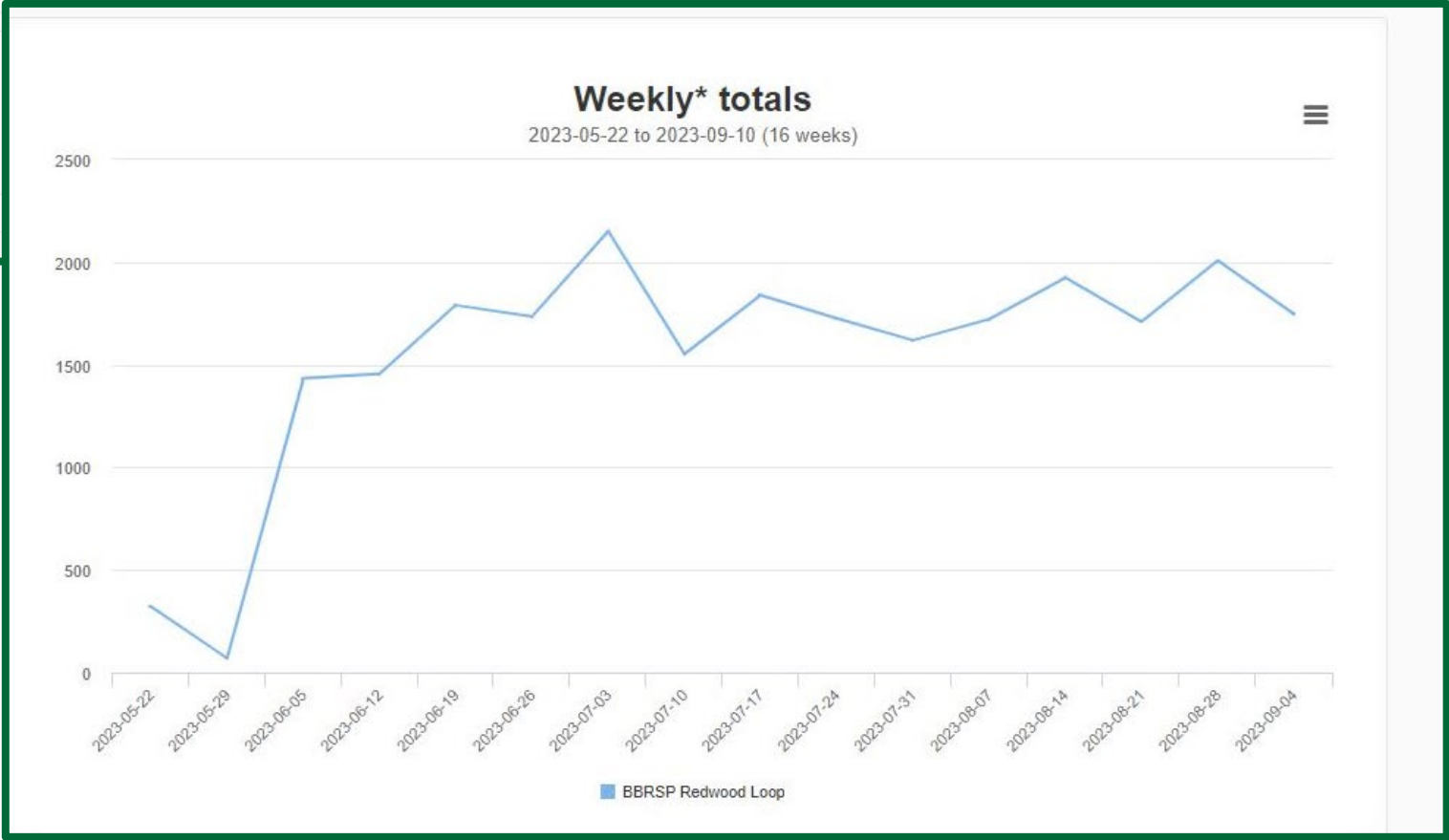
Select **All** **None**

Step 2 Select date range

Do step 1 first

Step 3 Select report type

Counts	Patterns	Pies
<input type="checkbox"/> Daily	<input type="checkbox"/> 24 hours	<input type="checkbox"/> Compare sites
<input type="checkbox"/> Weekly	<input type="checkbox"/> 7 days	<input type="checkbox"/> 7 day pie
<input type="checkbox"/> Monthly	<input type="checkbox"/> 52 weeks	
<input type="checkbox"/> All	<input type="checkbox"/> 12 months	



Volunteers & Partners

- Data Collection
 - Interns
 - Conservation Corps
- Data Collection Examples
 - Calibration
 - Encounters Monitoring
- Data Analysis
 - Ex: String Lakers Volunteer Group, University Partners



Take Home Messages

- 1 Attendance data can serve many purposes (though not all issues require attendance data)
- 2 Many methods are available; choose what is appropriate for the type of data needed
- 3 When designing monitoring, consider sampling, analysis, and leveraging partnerships

Discussion & Questions

