



The Tetons are calling and we must go:

Using science-based approaches to understand visitor use and experience at String and Leigh Lakes

UW-NPS Research Station
August 2nd, 2018





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Presentation Objectives

- Brief introduction
- Relevance of social-ecological research in National Parks
- Recent case studies in outdoor recreation research
- Research methods and preliminary results at String and Leigh Lakes
- 2018 data collection





Will Rice

B.S. Clemson University

Previous Protected Area Experience

Wind Cave National Park
Yellowstone National Park
Cape Cod National Seashore
Missouri National Recreational River
Grand Canyon National Park
USFWS Alaska Region

Current Research Projects

-String and Leigh Lakes, Grand Teton National Park
-Noise Pollution, Death Valley National Park
-Cultural Resources and Wilderness, Katmai National Park



Jenna Baker

B.A. Willamette University

Previous Experience

AmeriCorps NCCC

Rocky Mountain Youth Corps

UAF Long Term Ecological Research

Communications and Development

Current Research Projects

String and Leigh Lakes Visitor Use &
Experience Study



Audience Participation

Acceptability Exercise



How many is too many?

Please rate the acceptability of the following density of visitors on the beach?

-3,	-2,	-1,	0,	1,	2,	3
Unacceptable			Neutral		Acceptable	



Alternative #1



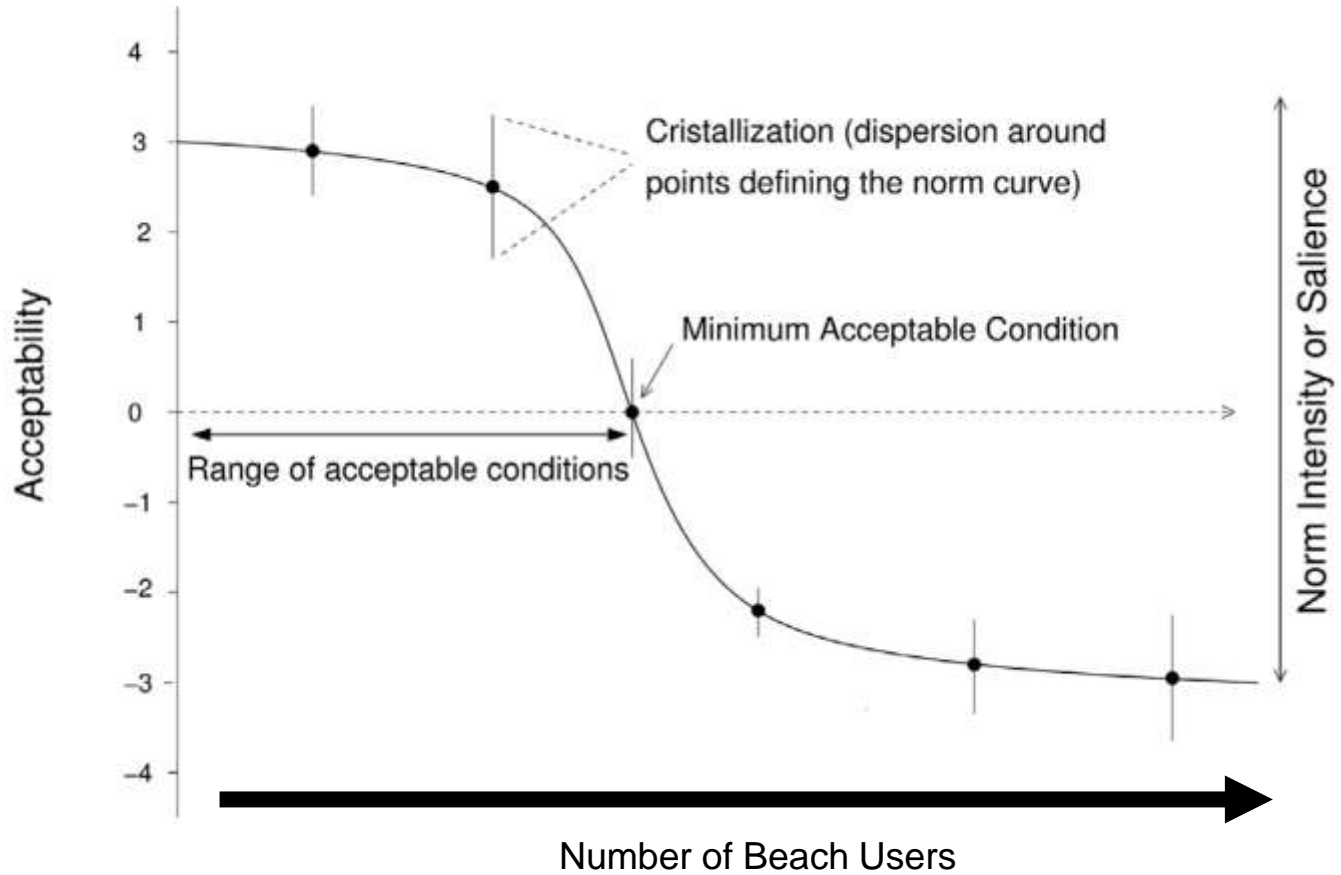
Alternative #2



Alternative #3



Alternative #4





Parks for the People

Why do we study people in parks?



"Some day a social scientist is going to have a great time working out the sociology of Jackson Hole."

-Margaret Murie, *Wapiti Wilderness*

Why do we study people in parks?



"In time preservationists discovered that the paragraph itself was subject to broad differences in opinion. Precisely what, for example, was meant by 'unimpaired'?"

-Alfred Runte on the dual-mandate in *National Parks: The American Experience*



Outdoor Recreation Research

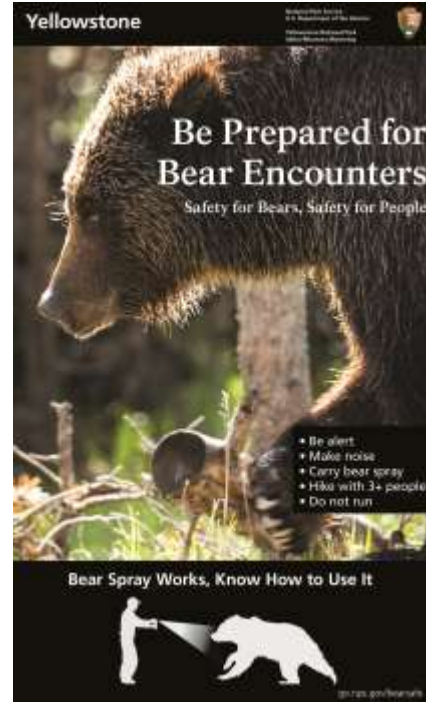
Human-Wildlife Interactions



Messaging



Case Study: Bear Safety Messaging in Yellowstone



Miller, Z. D., Freimund, W., Metcalf, E. C., & Nickerson, N. (2018). Targeting your audience: wildlife value orientations and the relevance of messages about bear safety. *Human Dimensions of Wildlife*, 23(3), 213-226.

Resource Damage



Soundscapes



Case Study: Soundscapes in Muir Woods



- **How can messaging influence the amount of human-caused noise in a popular park location?**
- Establish standards of quality for frontcountry soundscapes
- Assess the acceptability of human-caused noise
- Evaluate the effectiveness of varying messages

i.e. Pilcher, E. J., Newman, P., & Manning, R. E. (2009). Understanding and managing experiential aspects of soundscapes at Muir Woods National Monument. *Environmental Management*, 43(3), 425.

Crowding and Safety



Case Study: Crowding on Half Dome



Michael Maloney / Associated Press

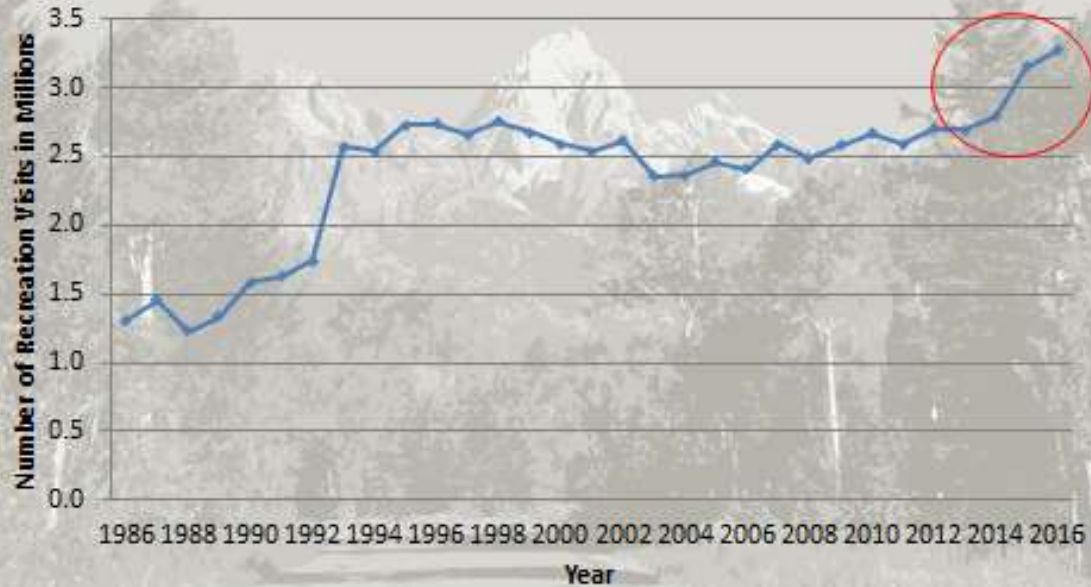
- **What is the threshold of Half Dome hikers that both yields ample opportunities and preserves the visitor experience and safety?**
- Established a threshold of 400 visitors per day
- Led to the creation of a permitting process

Pettebone, D., Meldrum, B., Leslie, C., Lawson, S. R., Newman, P., Reigner, N., & Gibson, A. (2013). A visitor use monitoring approach on the Half Dome cables to reduce crowding and inform park planning decisions in Yosemite National Park. *Landscape and Urban Planning*, 118, 1-9.



String and Leigh Lakes

Recreation visits to GRTE



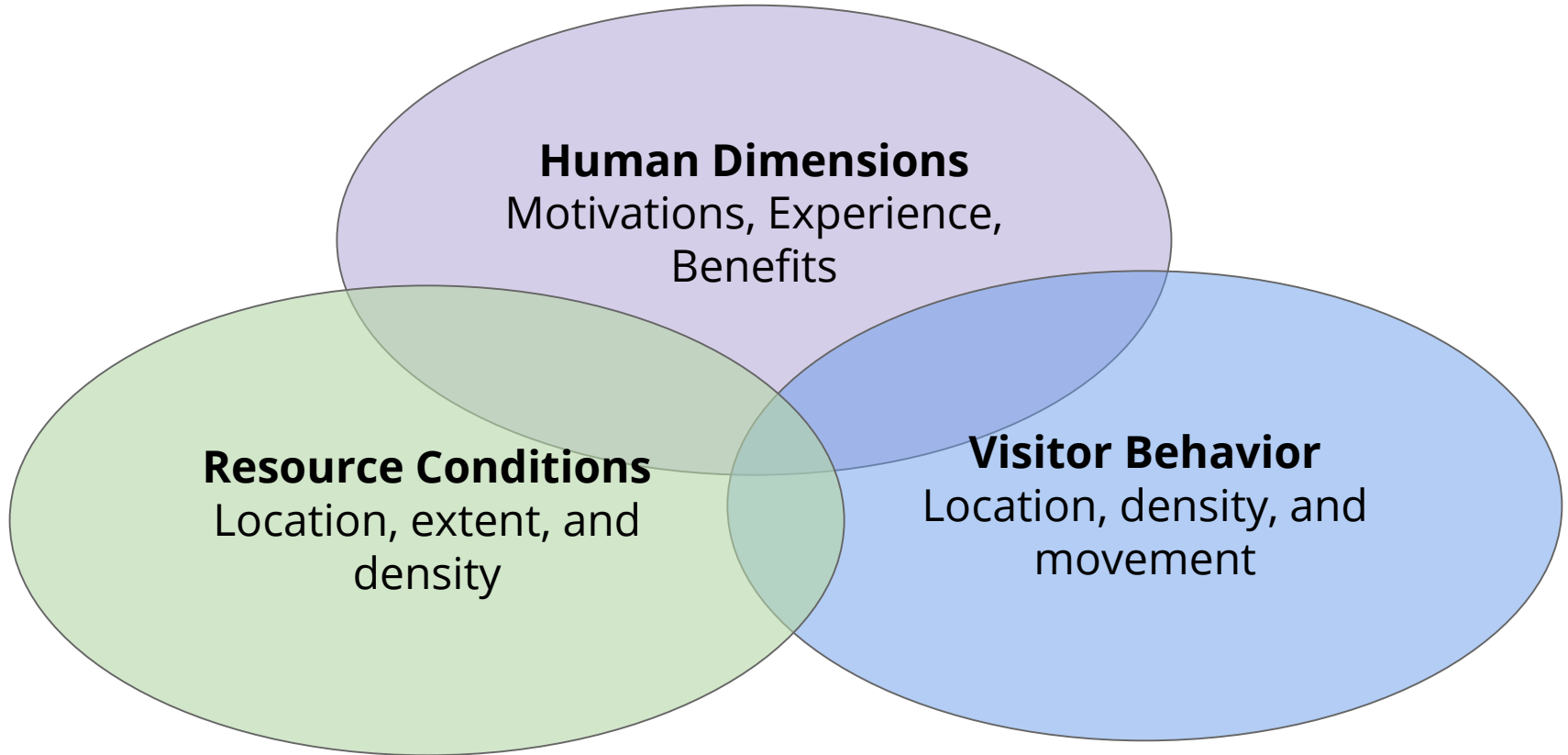
Source: NPS Visitor Use Statistics

Increased use at String & Leigh Lakes



Increase in use. **Filled** parking lots.
Densely **populated** shoreline. New **user** groups.

Methodological Approach



Study Period

July 15 - Sep 8
2017

June 27 - Aug 15
2018



Methodological Approach



Measuring Visitor Behavior and Use



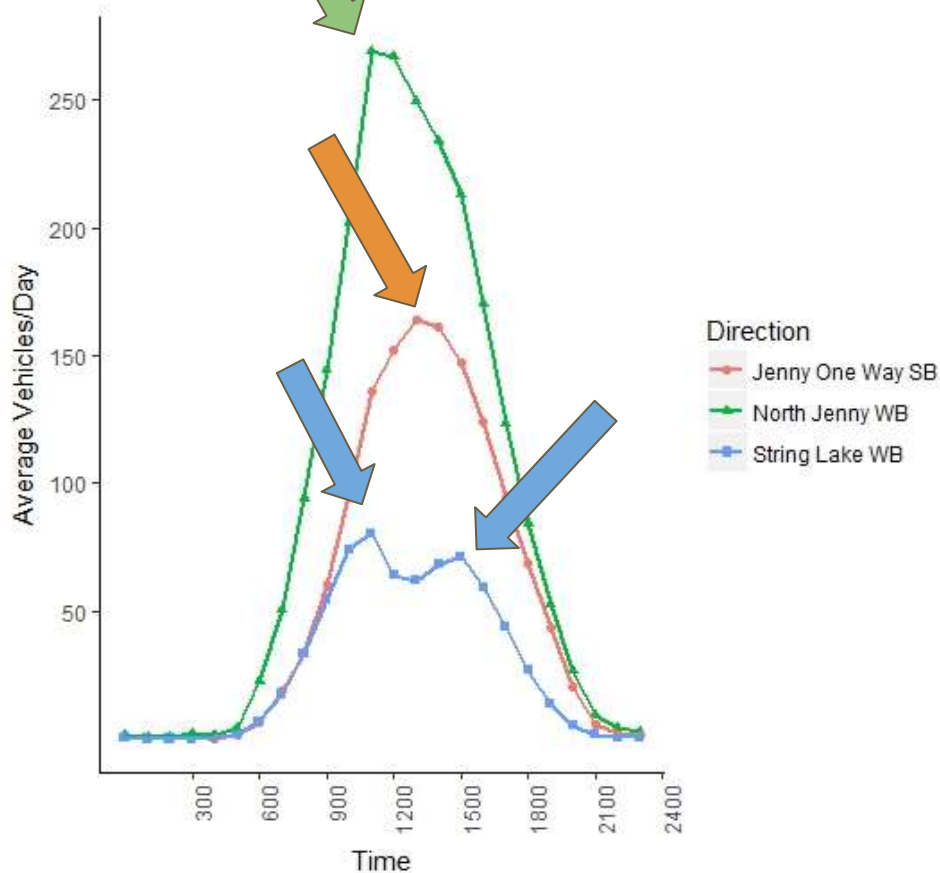
Vehicle Use Estimation

Three vehicle tube counters





Times of Peak Use (2017)



When is the peak time of people *arriving* to the area?

11:00am

One-Way Road peak
1:00pm

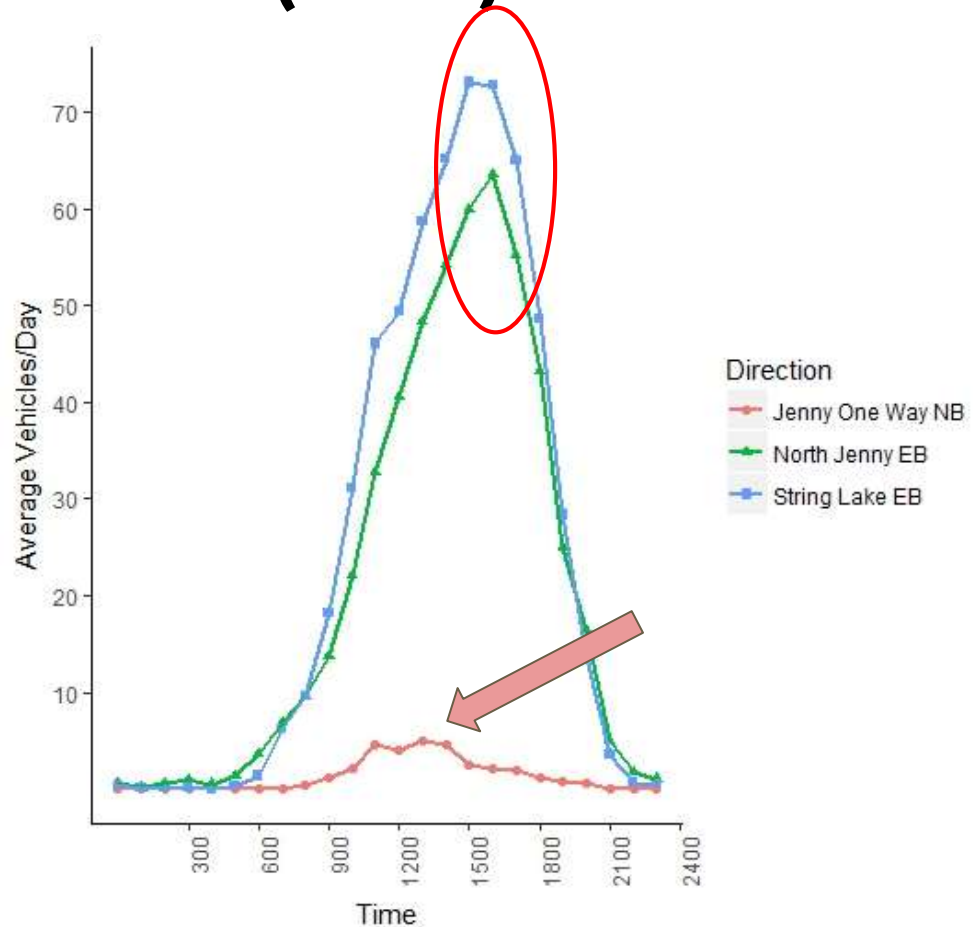
String Lake Road spikes again at
3:00pm

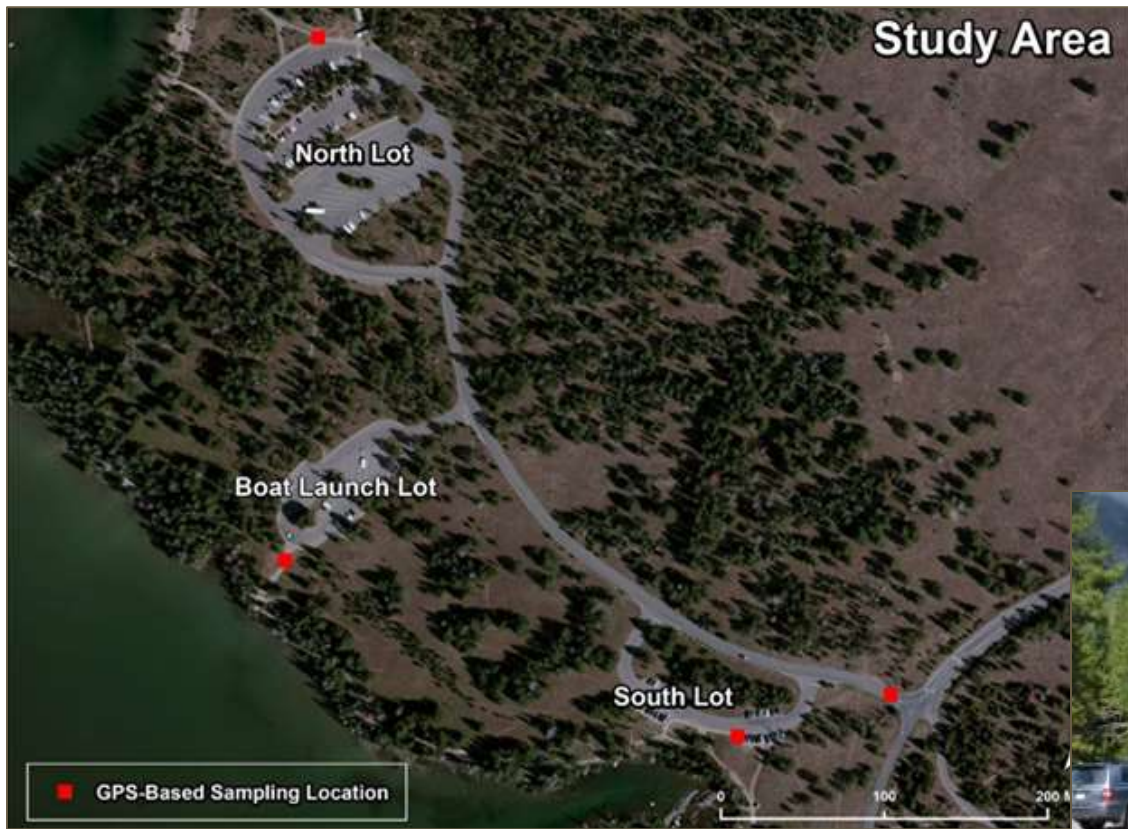
Times of Peak Use (2017)

When is the peak time of people *leaving* the area?

4:00pm

One-Way Road -- signs of vehicle activity??





Parking Lot Counts

Recorded number vehicles in parking areas every **30 minutes**



Vehicle Use Parking Patterns



Randomly intercepted
vehicles

Provided passengers with
GPS unit

GPS unit **remained in
vehicle**

Parking Lot Trends (2017)

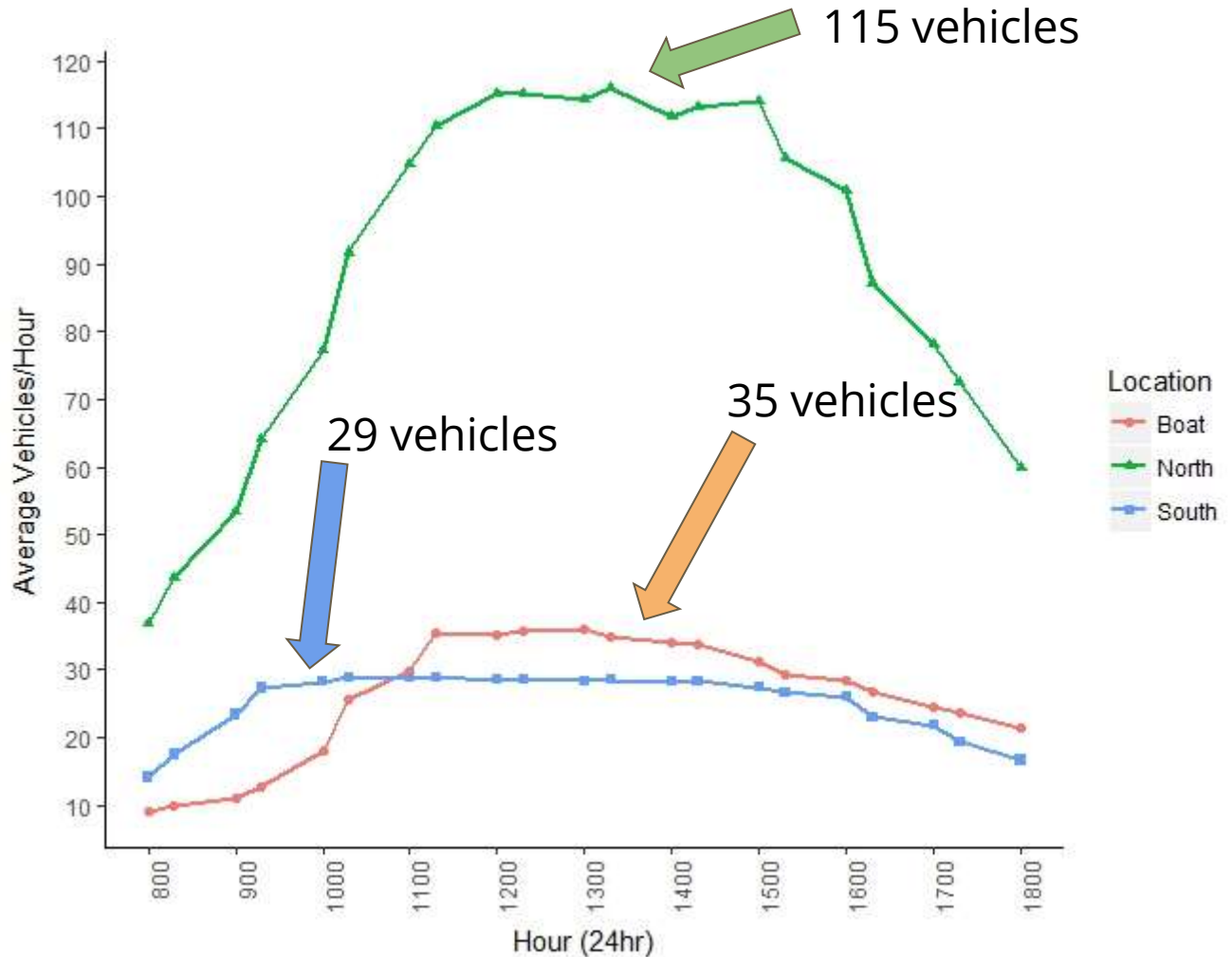
Average group size
3 ppl/vehicle



Average time parked

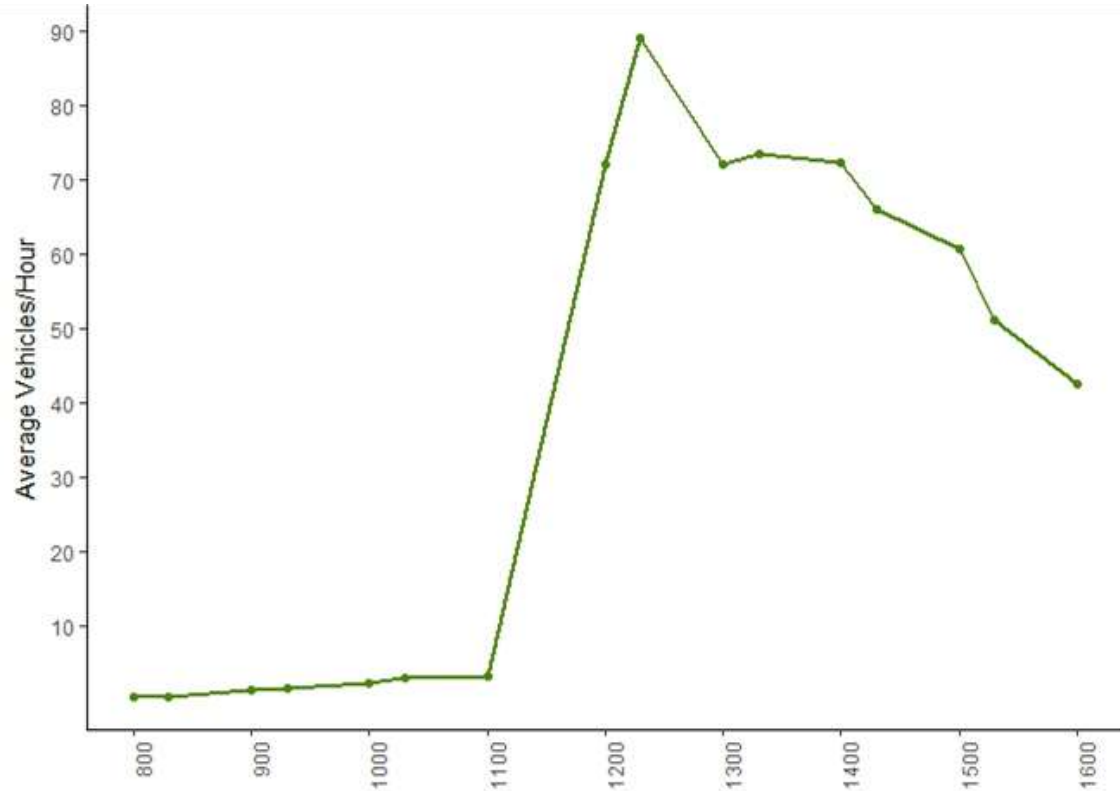


3 - 4 hours



Roadside Parking

Up to **89 vehicles** were observed along the Jenny Lake roadside



Pedestrian Use

6 trail counters installed in String/Leigh Lake area





Pedestrian Behavior Patterns

Randomly intercepted hikers at parking lots

Carried **GPS unit** with them for the duration
of their visit

One GPS per group



Where are they going?



N = 652 GPS tracks
89% response rate



Grand Teton
National Park Service
U.S. Department of the Interior
Grand Teton National Park
Zone 1: Picnic Area & Memorial Parkway
Planning

Visitor Experience Study In Progress

Leigh & String Lakes Visitor Use Study

PENNSYLVANIA STATE UNIVERSITY
OREGON STATE UNIVERSITY
UTAH STATE UNIVERSITY



Visitor Observations

Unobtrusively observed and recorded visitor activity, visitor behavior, and total number of visitors in each zone.

What are people doing?

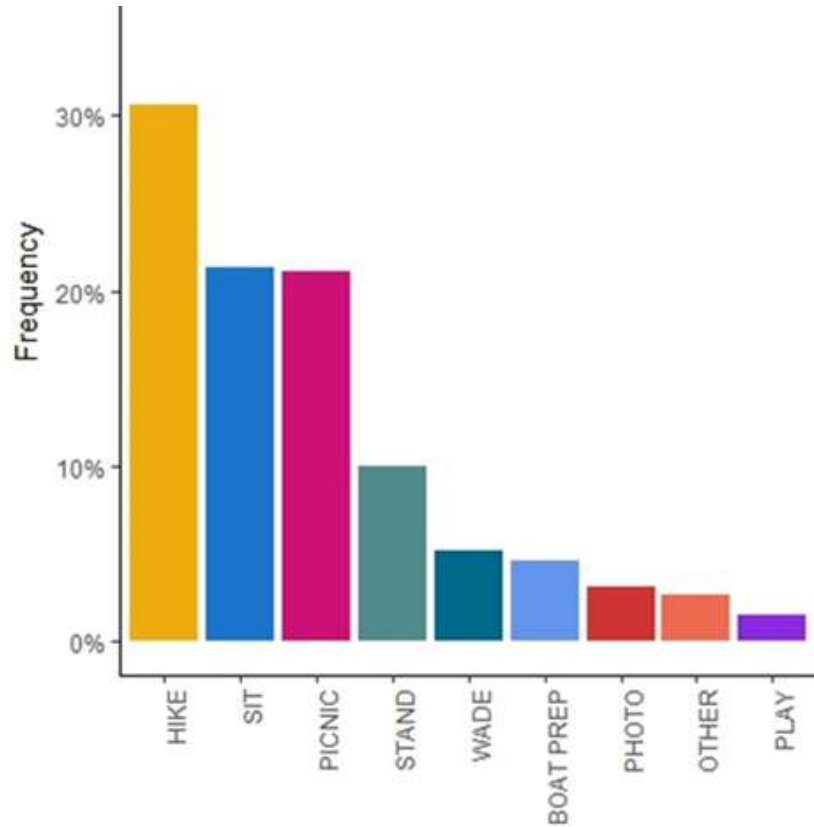
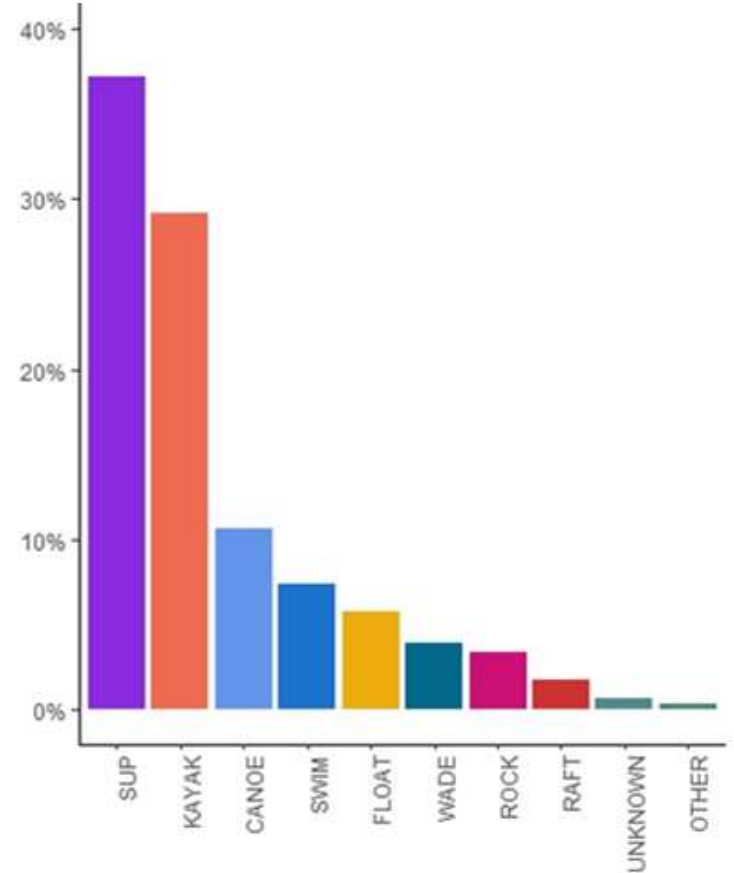


Photo Credit: Jo Torrijos

What about on the water?



37% of water-based users
Stand Up Paddleboard

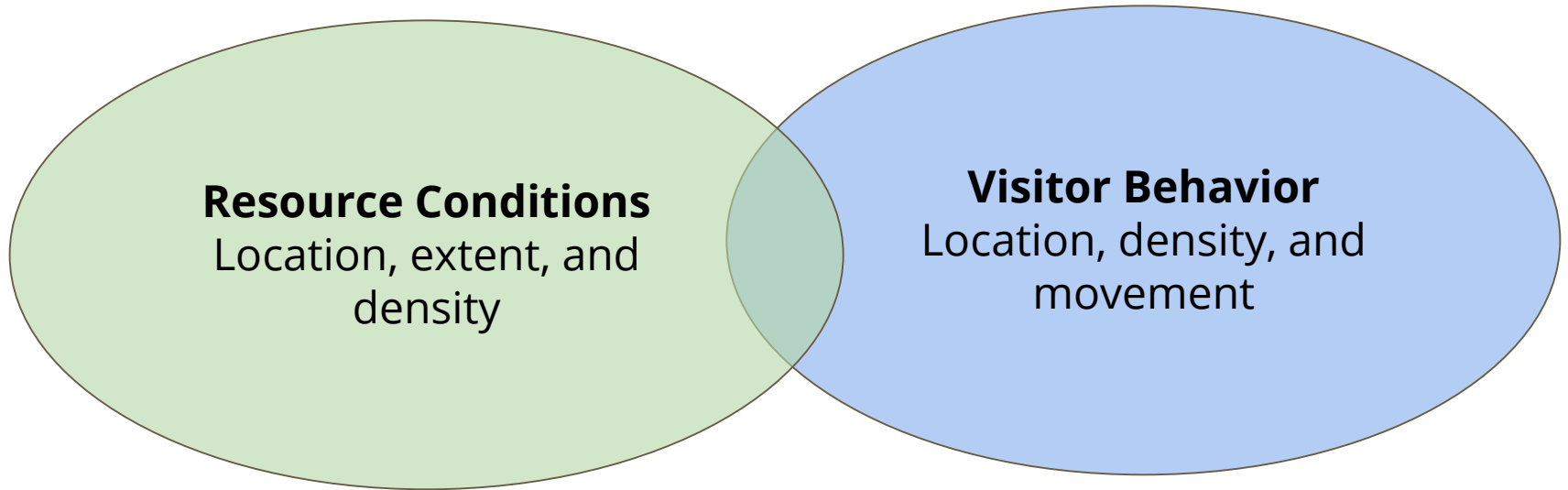


Variation between weekends/weekdays



80% increase
in water-based use on weekends

Methodological Approach



Measuring Recreation Related Impacts





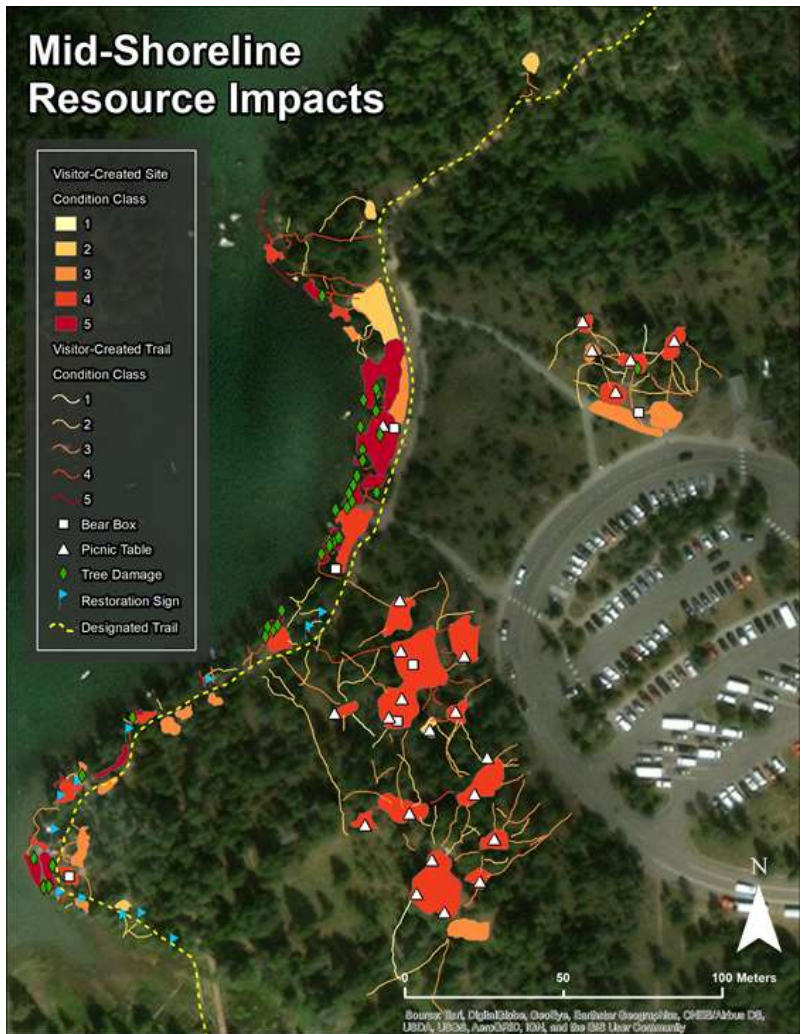
Inventory of Resource Impacts

Mapped and classified
visitor-created resource
impacts

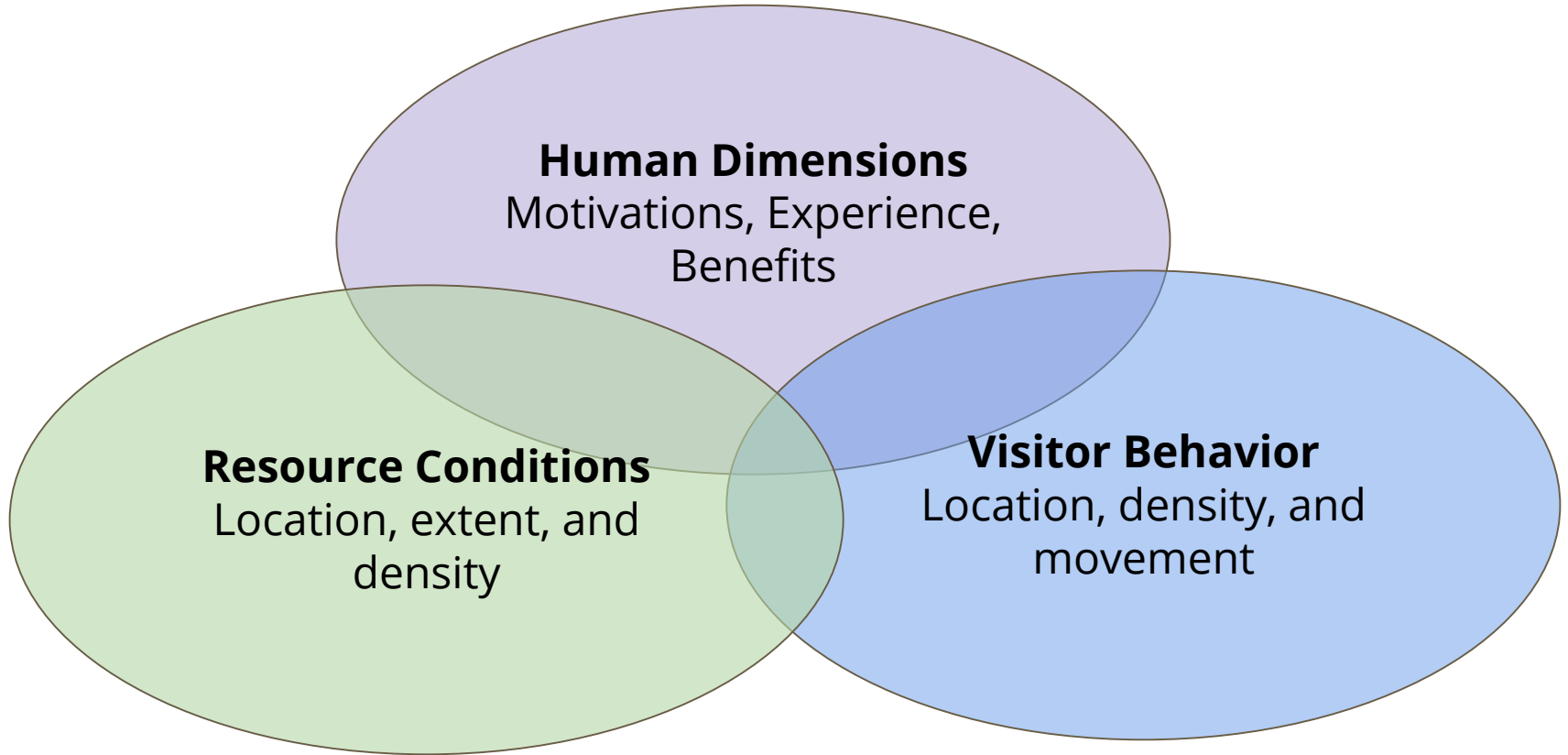
Areas of interest:
String Lake Loop Trail
Eastern Shore String Lake
String Lake Road Parking
Lot Areas



Resource Impacts



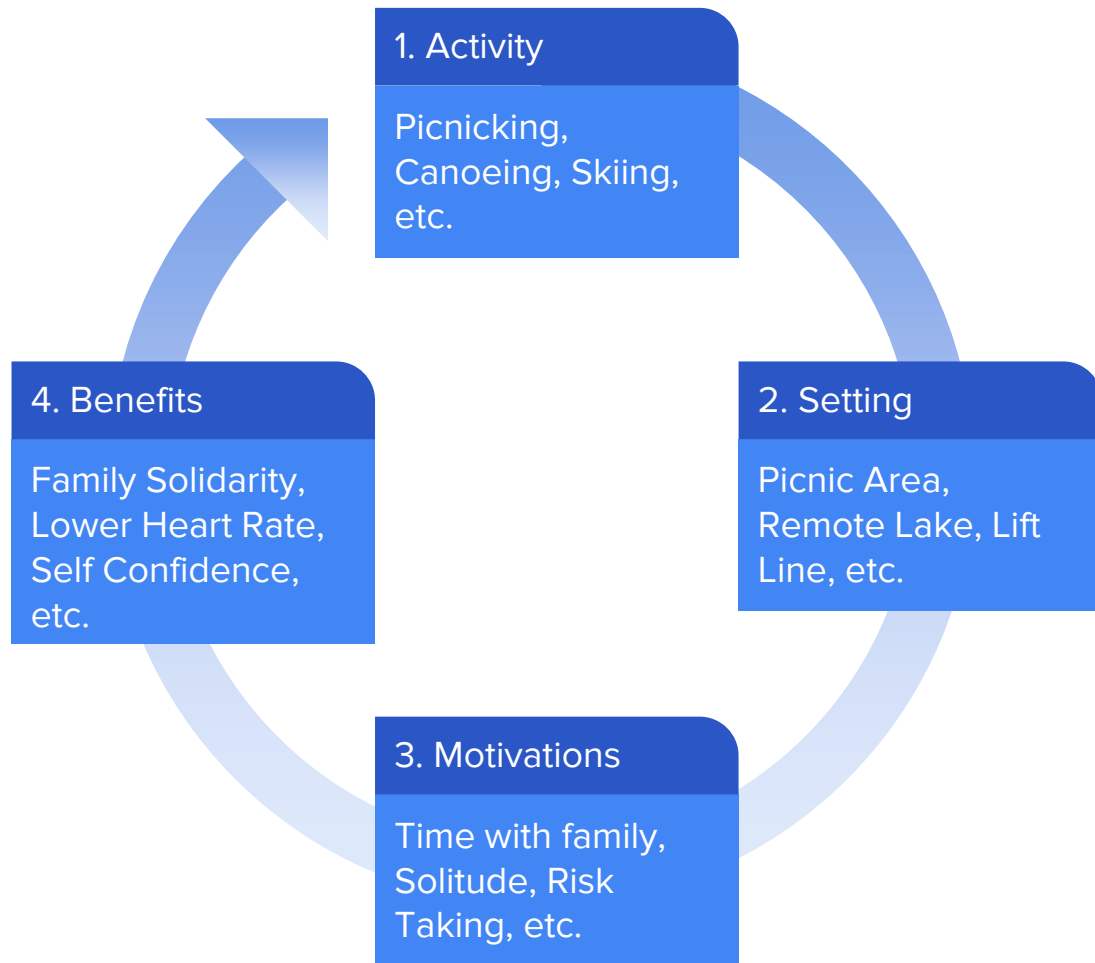
Methodological Approach



The Human Dimension



Recreational Opportunity Demand Hierarchy

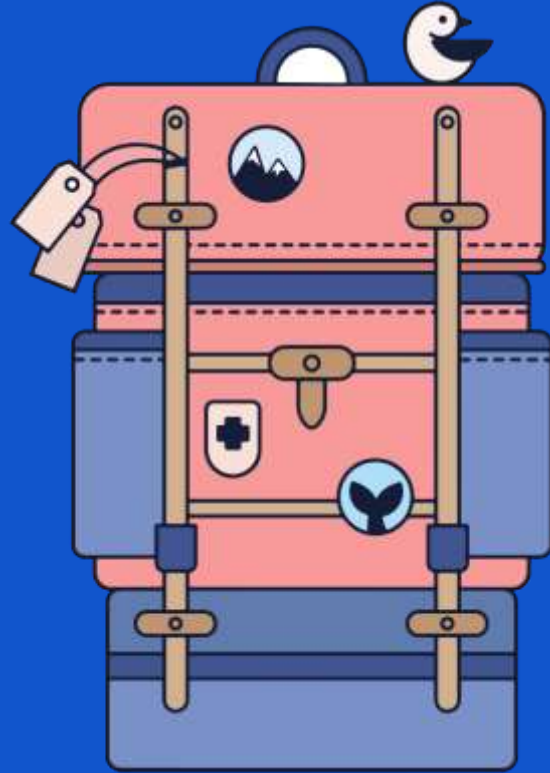


Activity

Setting

Motivations

Benefits





Canoe/
Kayak



Picnic



Hike



Beach



Backpack



SUP

PRIMARY ACTIVITIES targeted

Park Staff

Activity
Setting

Motivations

Benefits



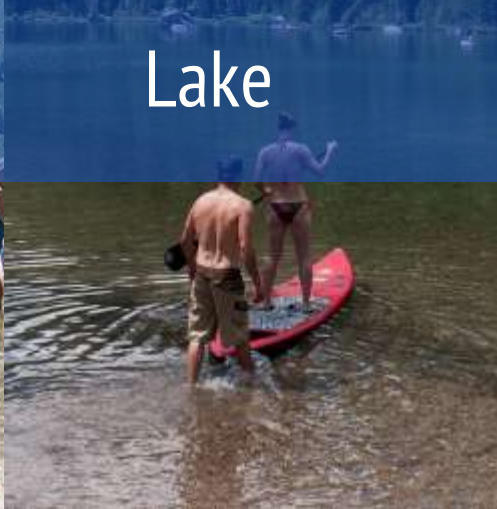


Beach

Lake

Picnic Area

Loop Trail



PRIMARY DESTINATIONS AT STRING LAKE AREA most often reported

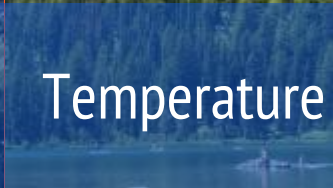
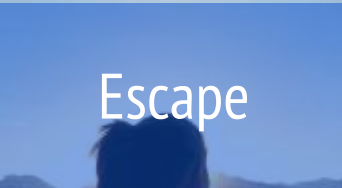
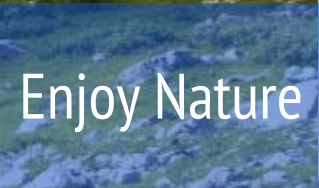
Activity

Setting

Motivations

Benefits





Enjoy Nature

Escape

Rest/Relax

Quiet

Temperature

Togetherness



MOTIVATIONS most often reported

Manning, 2011

Activity
Setting
Motivations
Benefits



Intersite
Displacement



Intrasite
Displacement



Temporal
Displacement



Conflict with
the NPS



Human/
Wildlife
Conflict



Conflict with
visitors



BENEFIT INTERFERING VARIABLES reported

2018 Data Collection





Land-User Survey

Administered to all land-based users
at String and Leigh Lakes

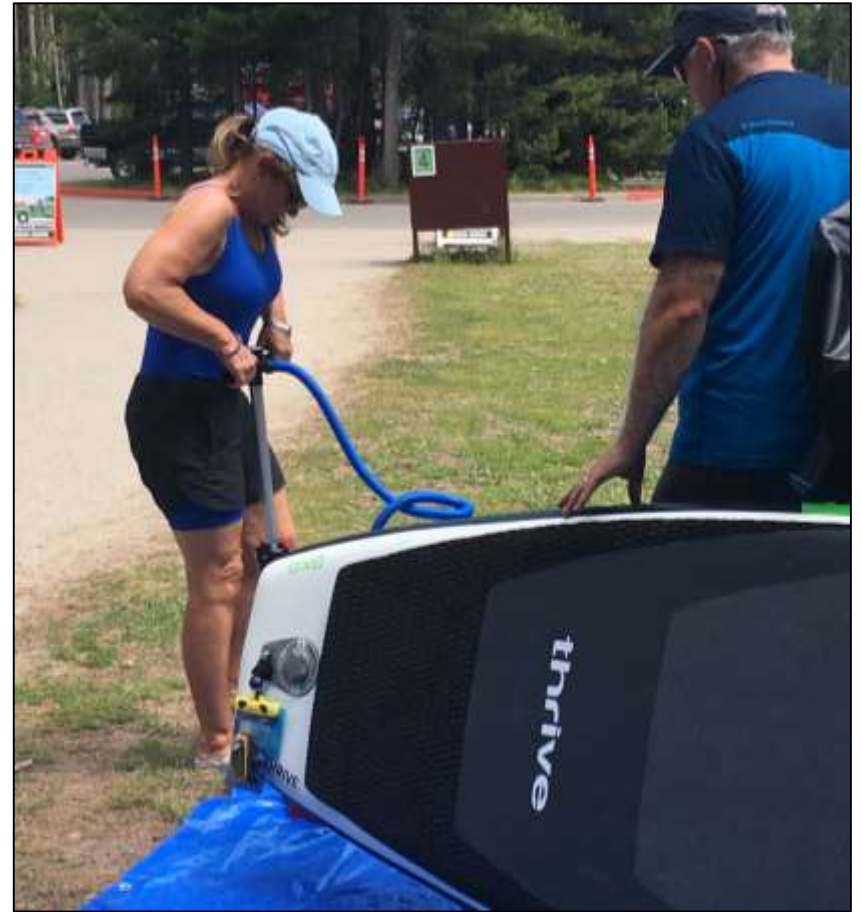
Paired with GPS track



Water-User Survey

Administered to all water users
at String and Leigh Lakes

Paired with GPS track



Vehicle Survey

Administered before arrival at
String and Leigh Lakes
Paired with GPS track



Why does it matter?



www.nps.gov



www.recreation.gov

Acknowledgements - Thank You!

National Park Service

Abby Kidd

UW-NPS Research Station/ AMK Ranch

2017 Field Crew: Michael Hilmes,
Jack Gottschalk, Jennifer Garner,
Dylan Fadgen, Josh Petit, Morgan
DeMeyer

Dr. Jenn Newton

Margaret Wilson

George Montopoli

2018 Field Crew: Michael Hilmes,
Jack Gottschalk, Noah Creany,
Stephanie Freeman, Matt Enderle

Jessica Erwin

'String Lakers' volunteers

Interested in learning more?



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