



Outdoor Recreation: Research, Monitoring and Planning

A PROGRAM OF RESEARCH ON
THE NATURE RESERVE OF
ORANGE COUNTY

JUNE 8, 2022

Recreation Use and Human Valuation on the Nature Reserve of Orange County California

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Outline for Today's Presentation



Brief Overview- Project Goals and Accomplishments



Human Dimensions of Recreation



Habitat & Resource Protection



Exogenous Factors



Recreation Management Frameworks

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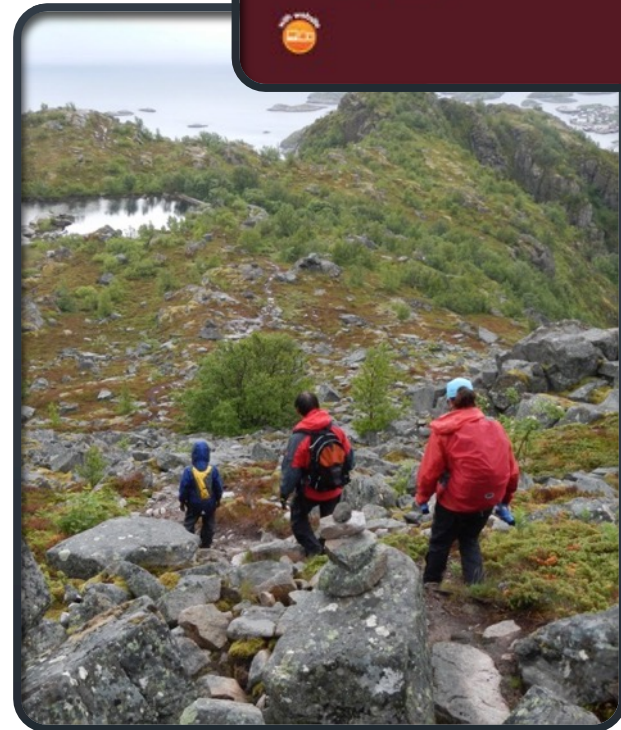
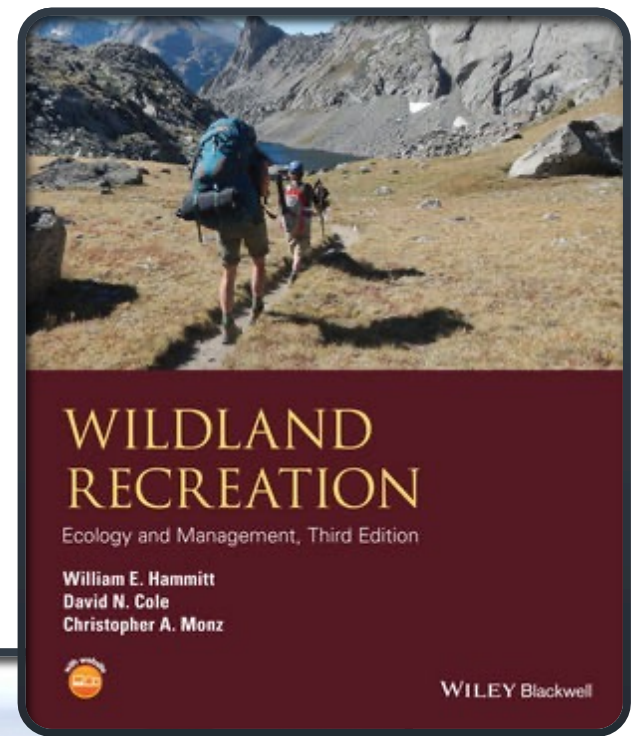
Exogenous Factors



Recreation Management Frameworks

Recreation Ecology

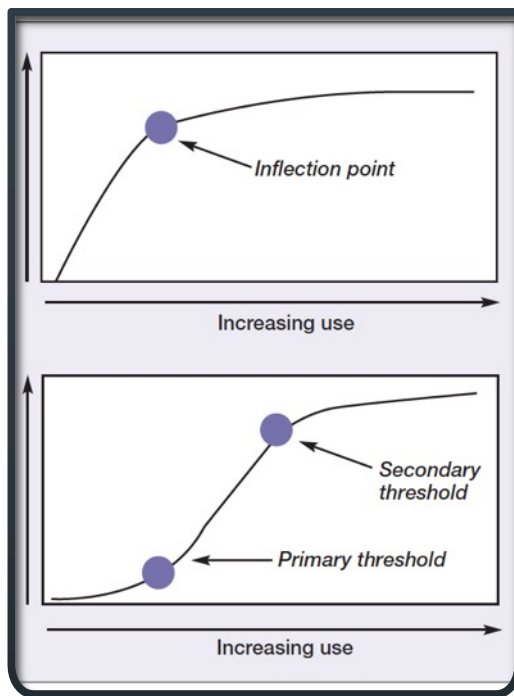
- Origins in the 1920's in Europe and the USA
- Approximately 1300 published studies
- How recreation *activities* affect to soil, vegetation, wildlife, water and air
- How human disturbance affects the visitor experience
- Knowledge informs sustainable management



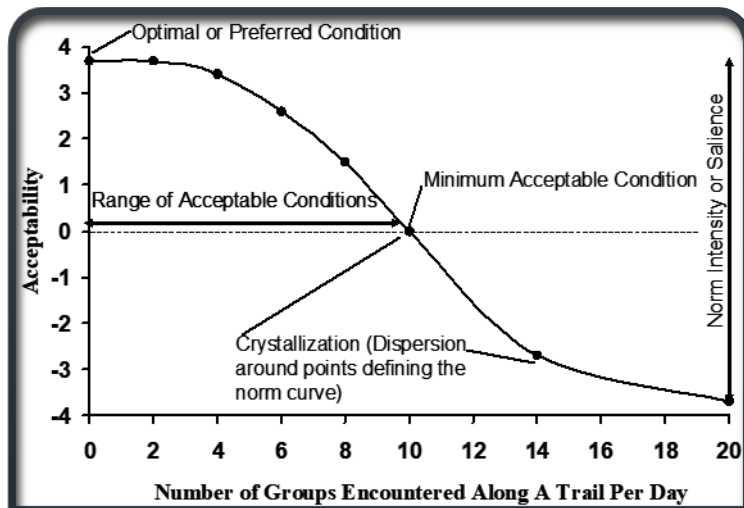
Recreation Ecology Theory:

Social and ecological

- Initial use results in the majority of impact- confinement strategies are often needed
- Visitors often judge the acceptability of conditions and this *can* affect their experience
- Many situational variables influence these responses



Use-Impact Theory



Norm Theory

Grand Teton NP: Moose-Wilson Corridor Comprehensive Plan



Comprehensive
visitor use,
experience and
ecological
assessment to
inform
management
decisions

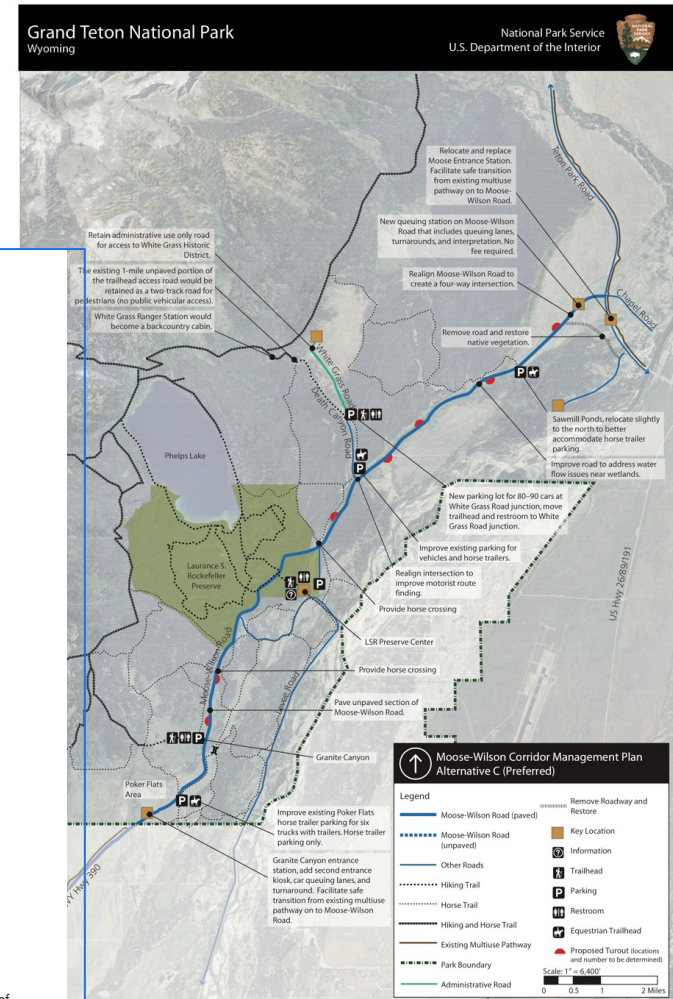
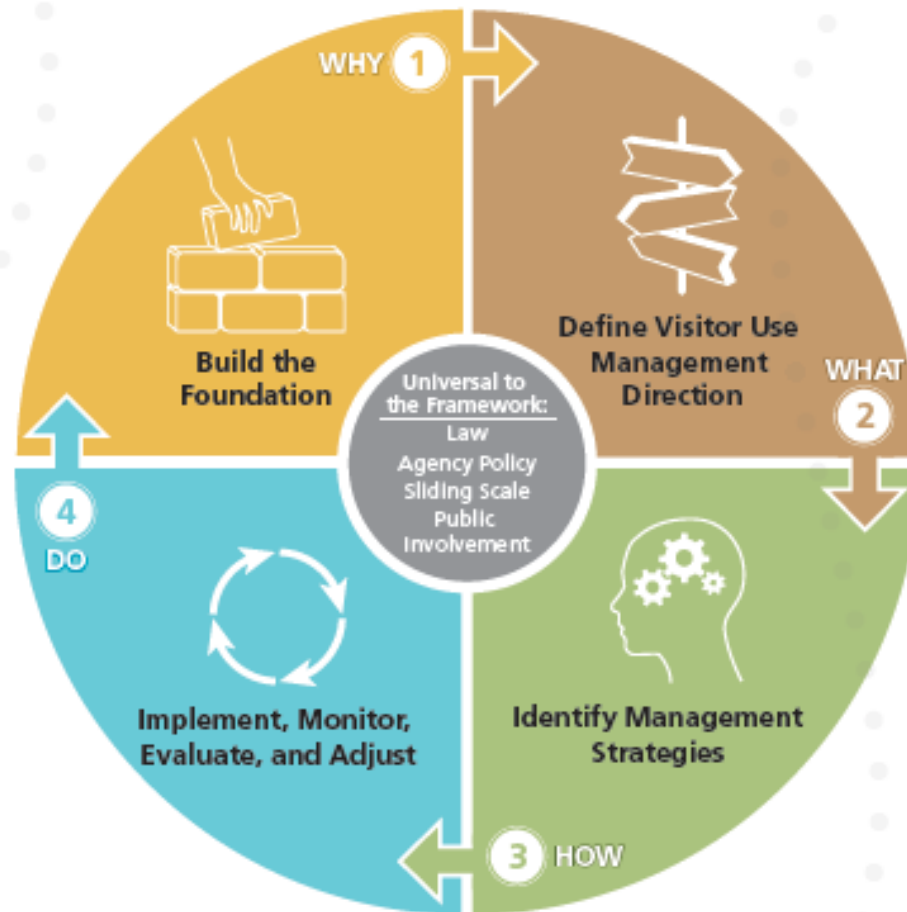


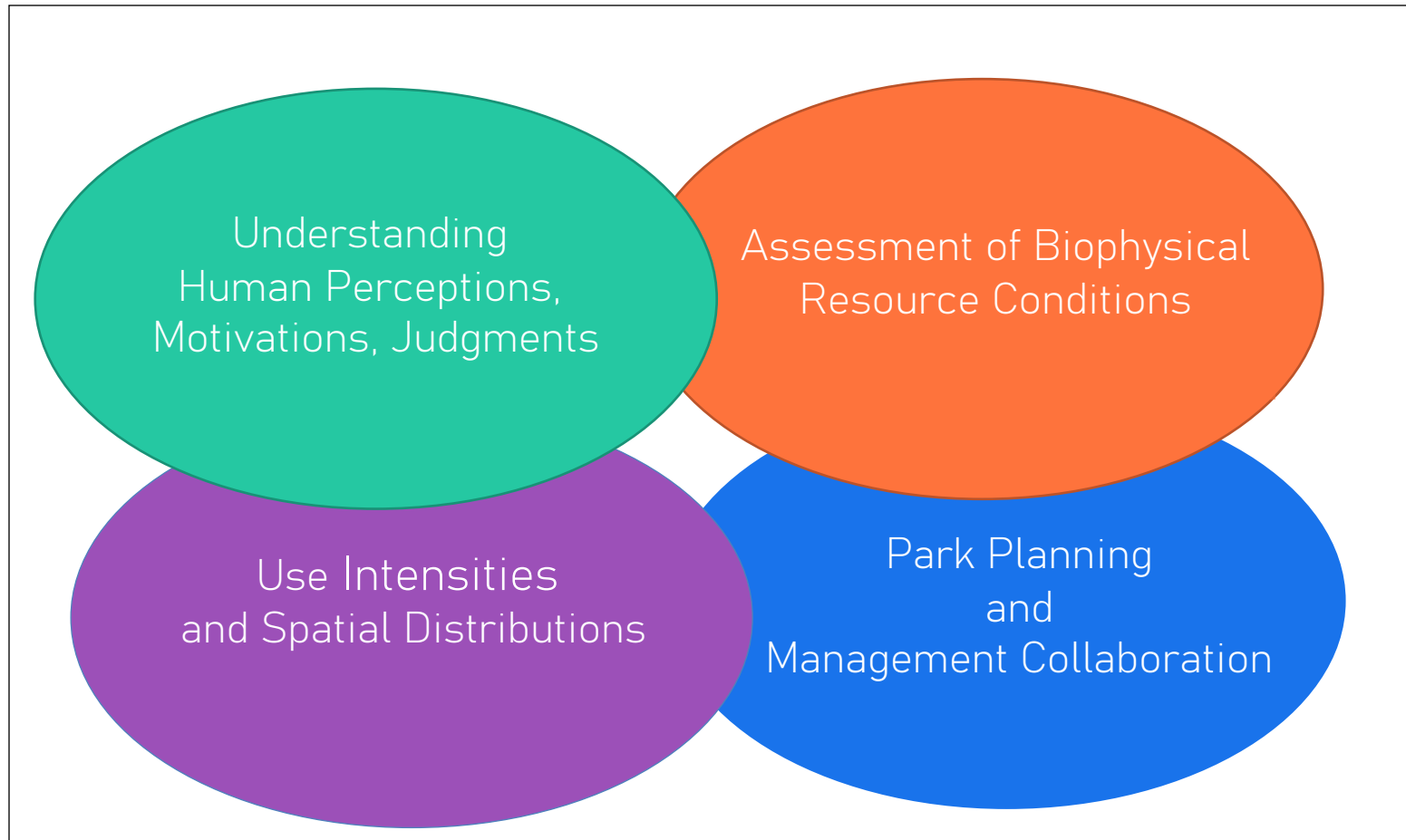
FIGURE 1. VISITOR CAPACITY OF THE MOOSE-WILSON CORRIDOR: PEOPLE AND VEHICLES AT ONE TIME

Visitor Use Management Planning Framework

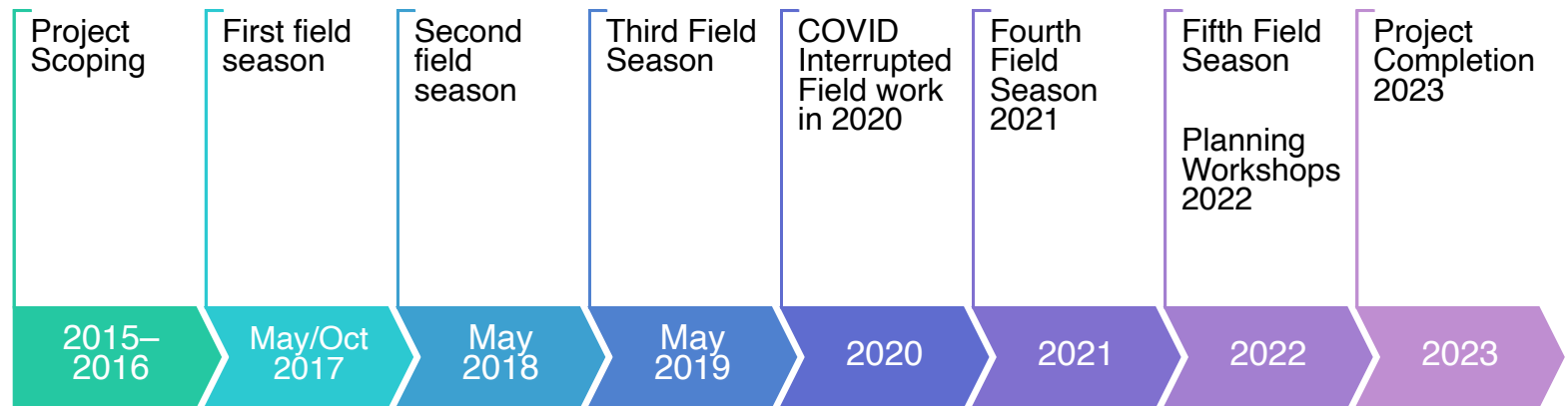
Overview of the Visitor Use Management Framework



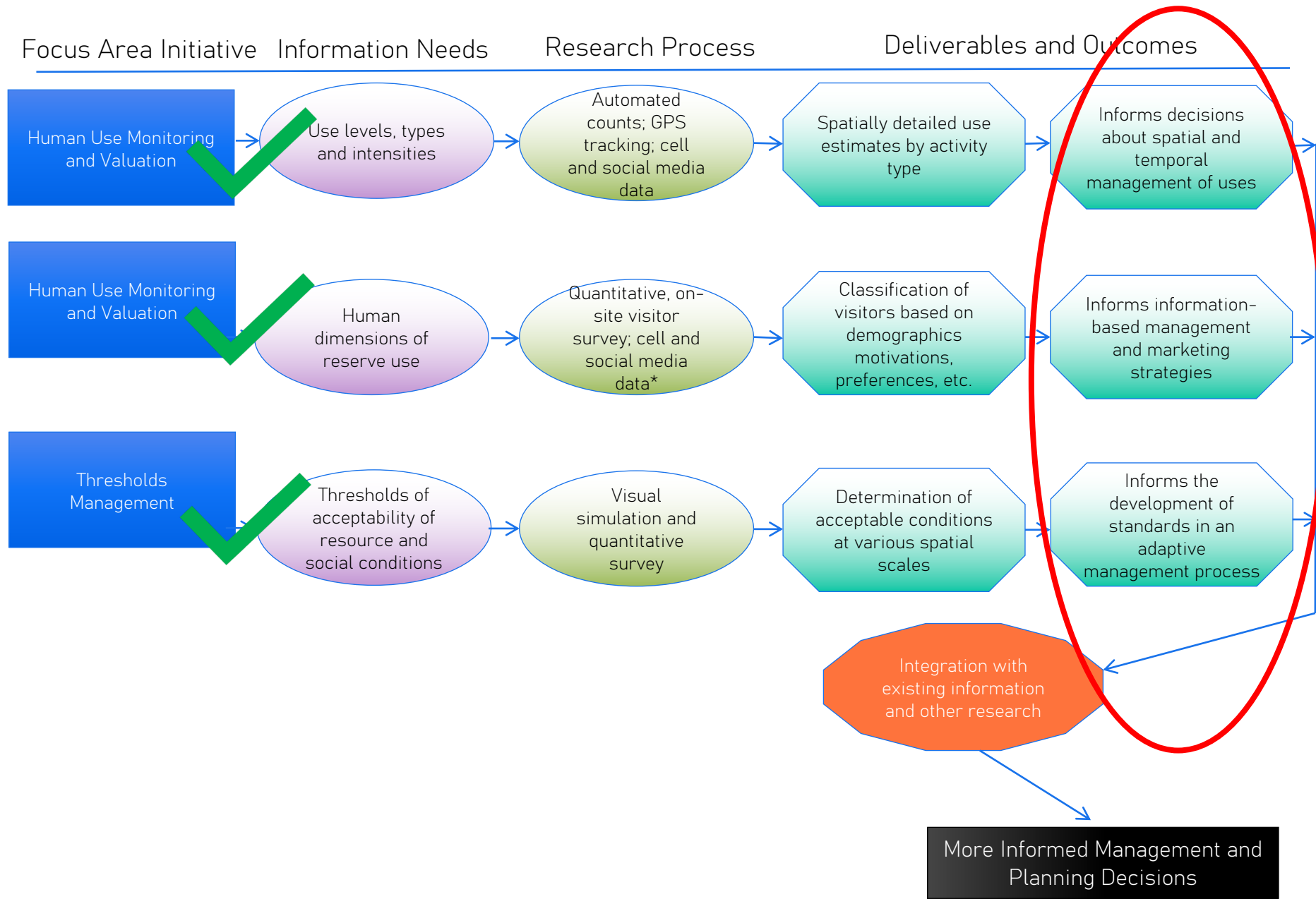
Project Approach



Project Timeline



Project Accomplishments and Outcomes- Where Are We Today?



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Human Dimensions of Recreation



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Recreation Management Frameworks



Use estimation study 2017-2018:

>3.2 M visits annually

Social science/visitor questionnaire



- Entrance area/trailhead intercepts
- Descriptive and evaluative responses from visitors post experience
- Generally > 1000 participants and high participation across activity types
- Questions derived from NPS "Pool of Known Questions"

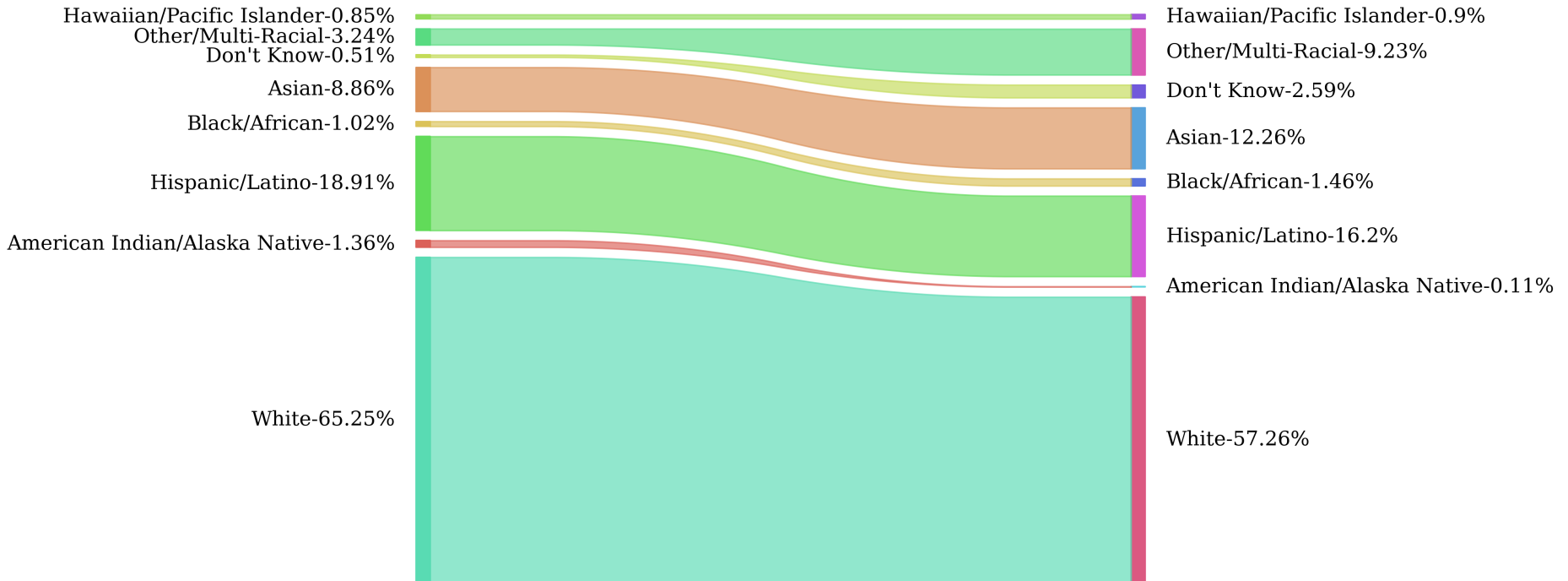
Visitor Demographics



Park Visitor Reported Race/Ethnicity

2017

2021



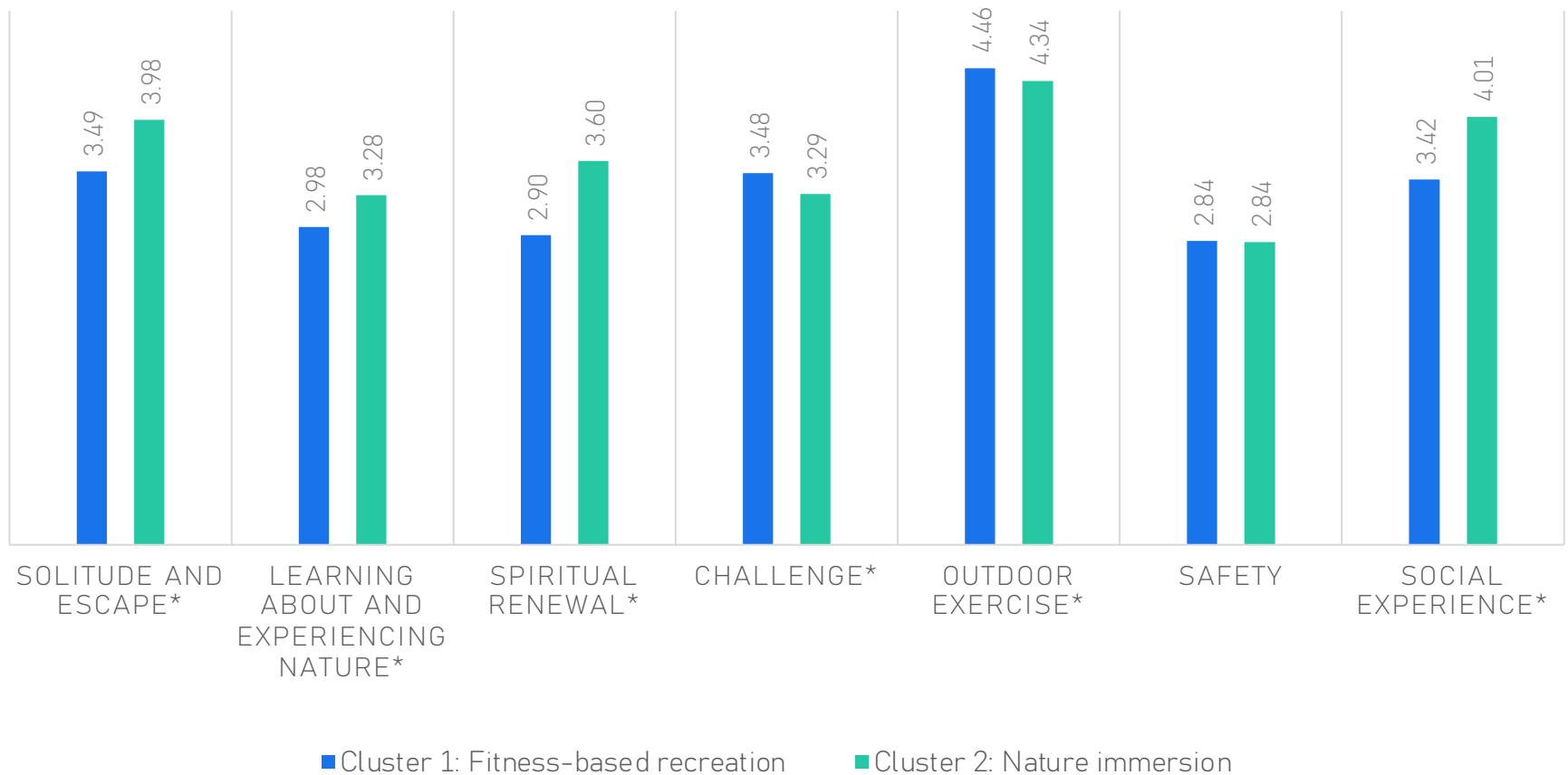
Visitor Motivations

37 question Recreation Experience Preference (REP) scale yielded 7 different latent constructs

- Solitude and escape
- Learning about and experiencing nature
- Spiritual renewal
- Challenge
- Outdoor exercise
- Safety
- Social experience

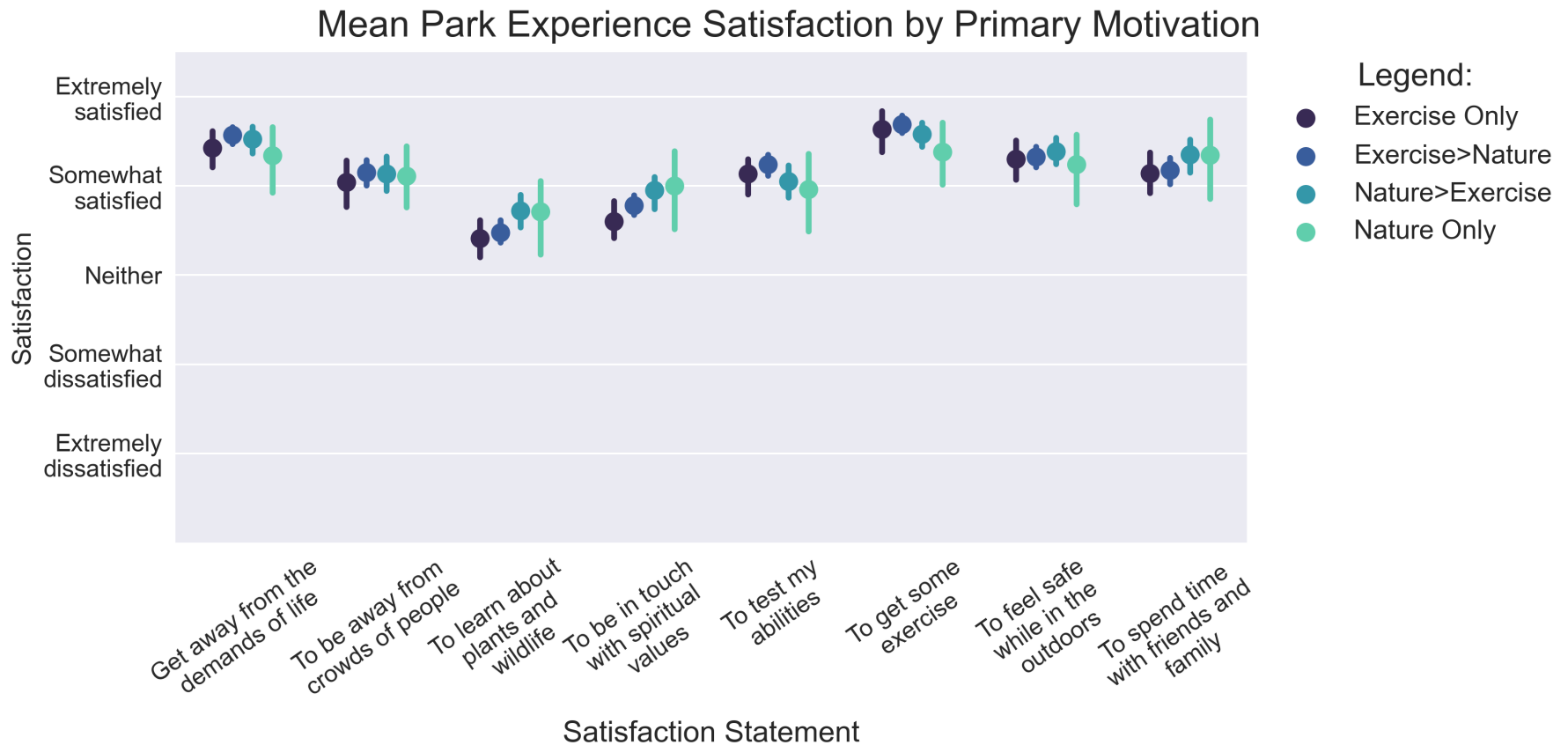
Visitor Motivations: Descriptive

MOTIVATIONS BY VISITOR TYPE



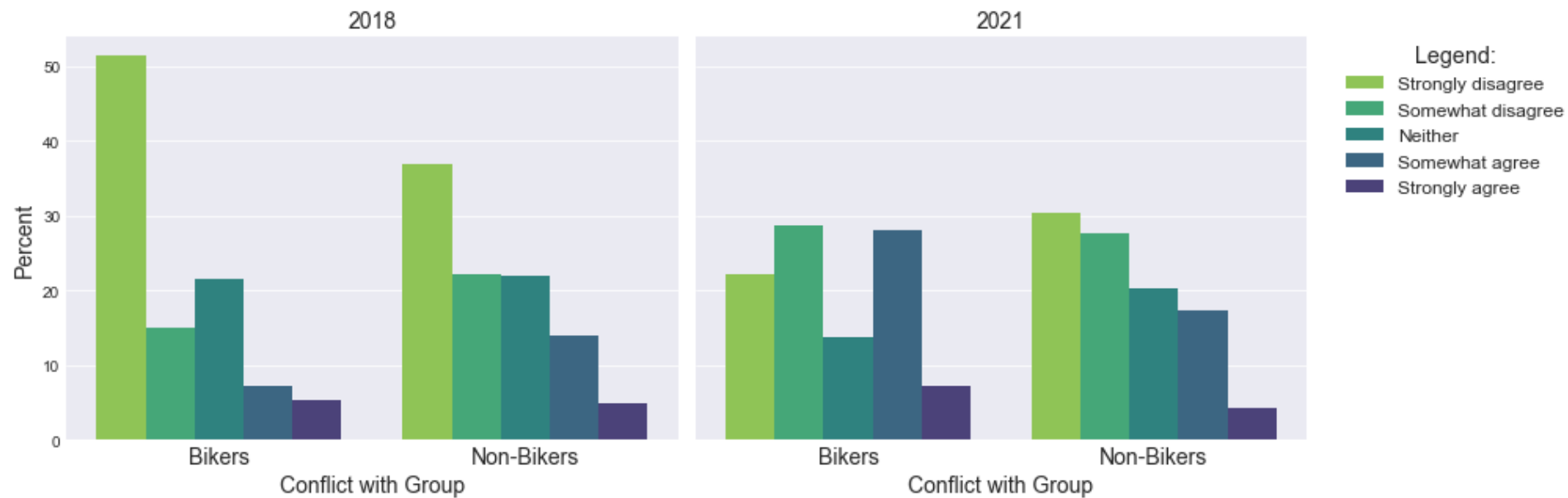
Results from a 37 item motivations scale

Visitor Motivations: Evaluative

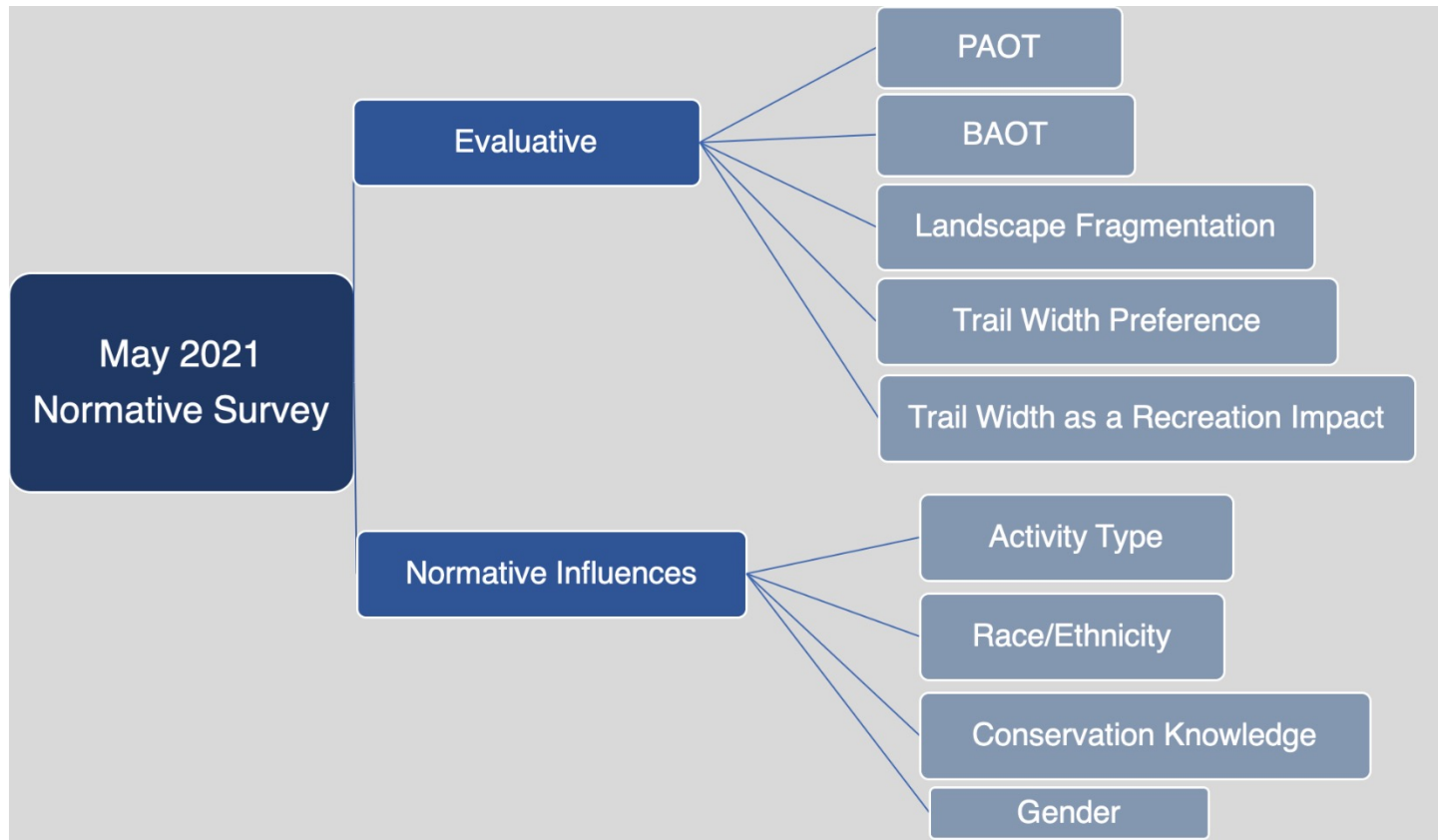


Conflict

2018 vs 2021 Visitor Reported Conflict



Normative Survey Conceptual Design



Crowding Index: People at one Time (PAOT)



PAOT 0



PAOT 5



PAOT 10

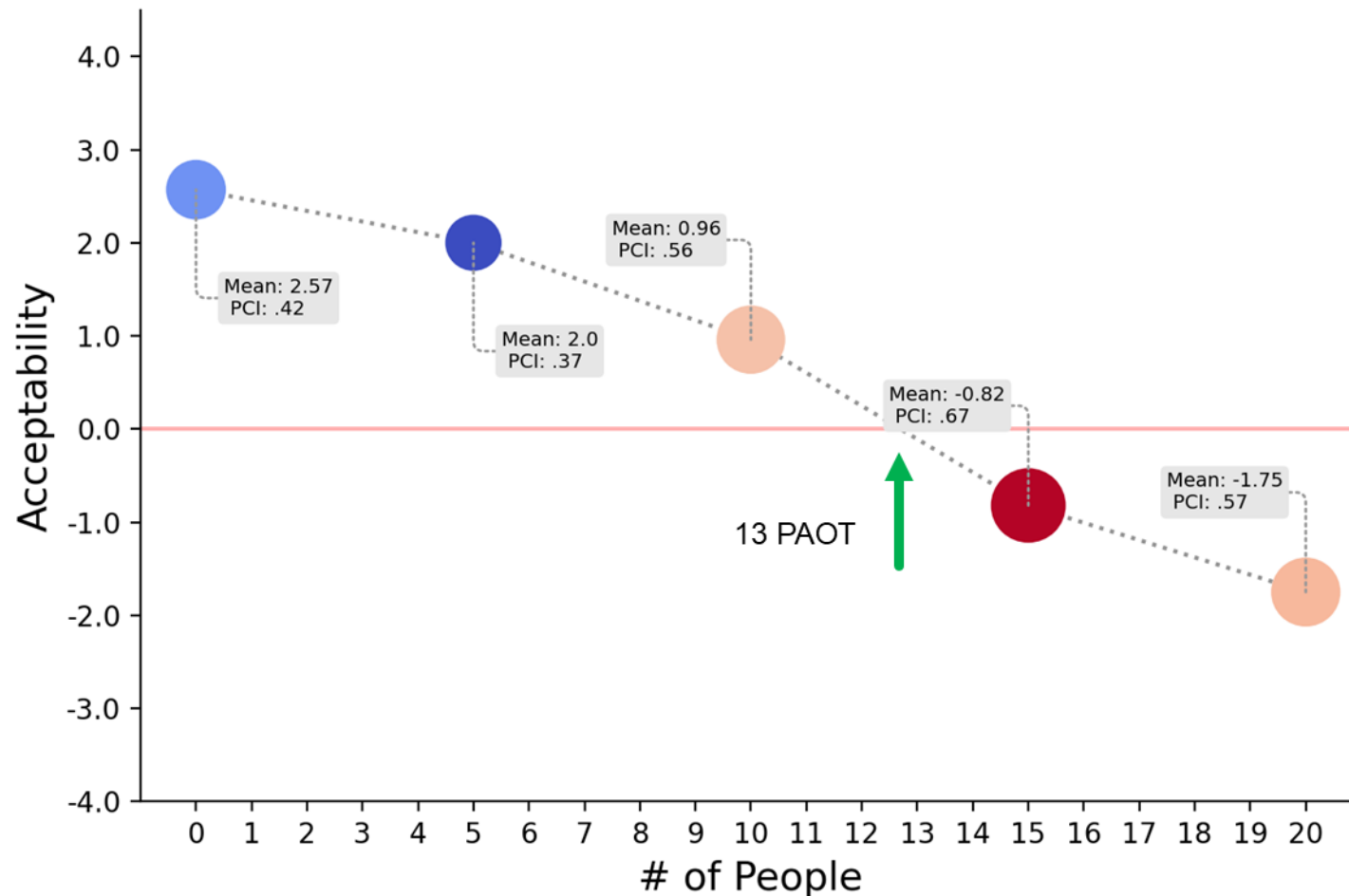


PAOT 15

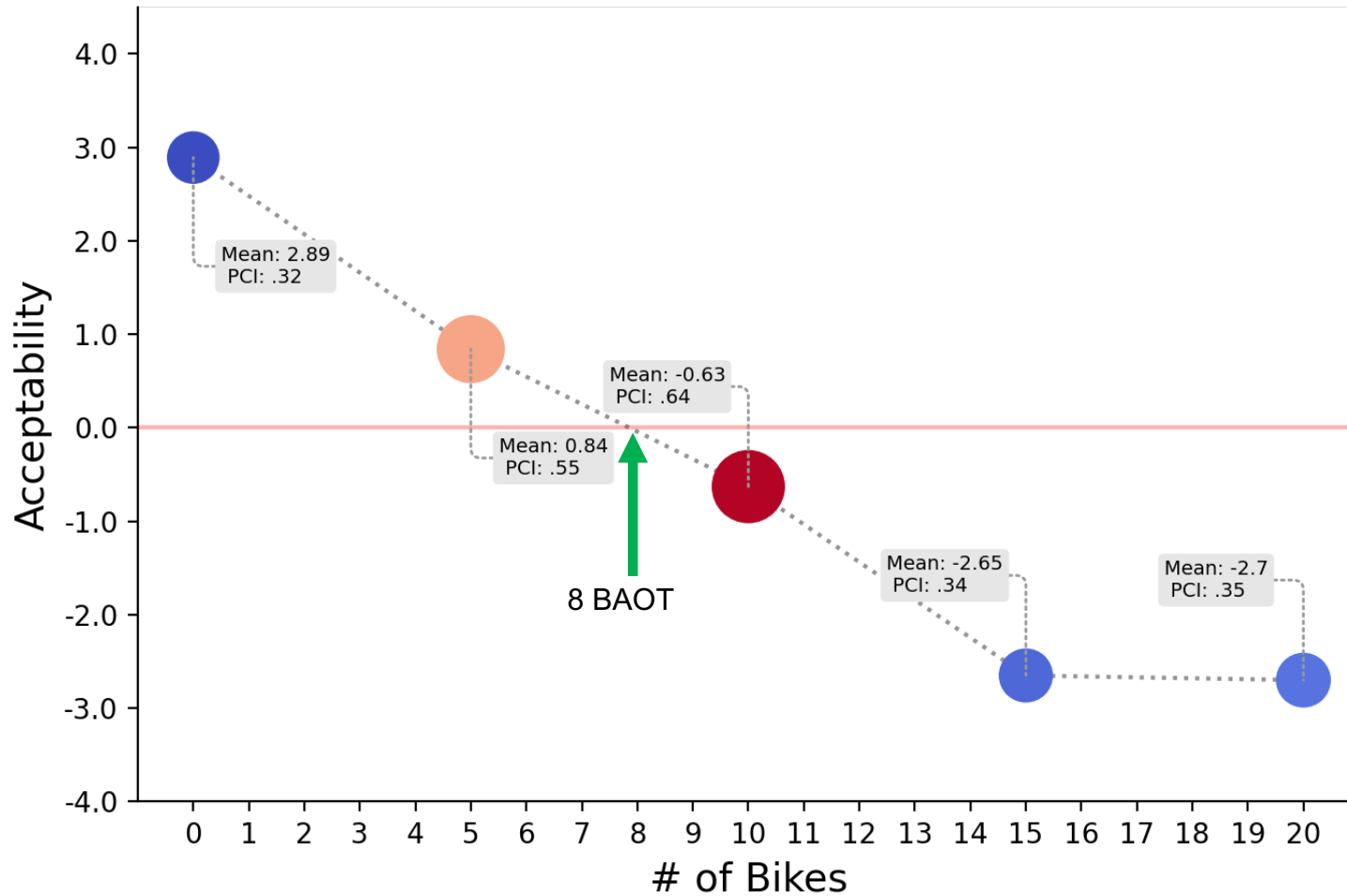


PAOT 20

Crowding Index: People at one Time (PAOT)



Bikers at one Time (BAOT)



Ecological Indicator: Trail Width



<50cm



50-100cm

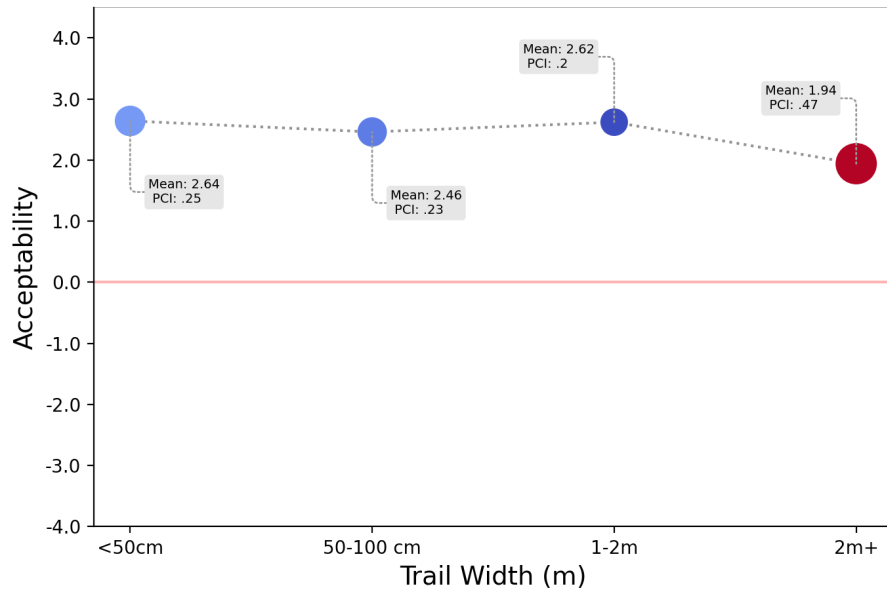


1-2m

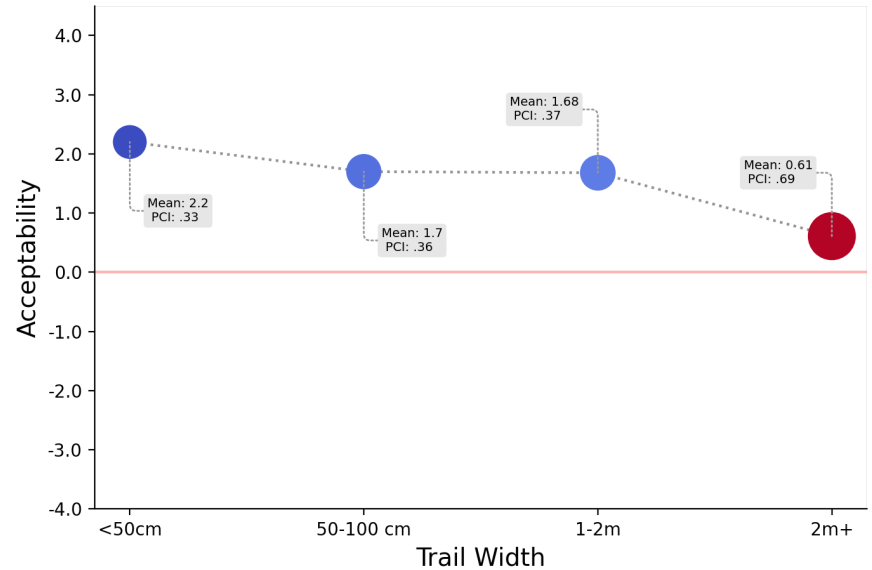


2m +

Trail Width



Recreation Preference



Recreation Impact

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Recreation Management Frameworks

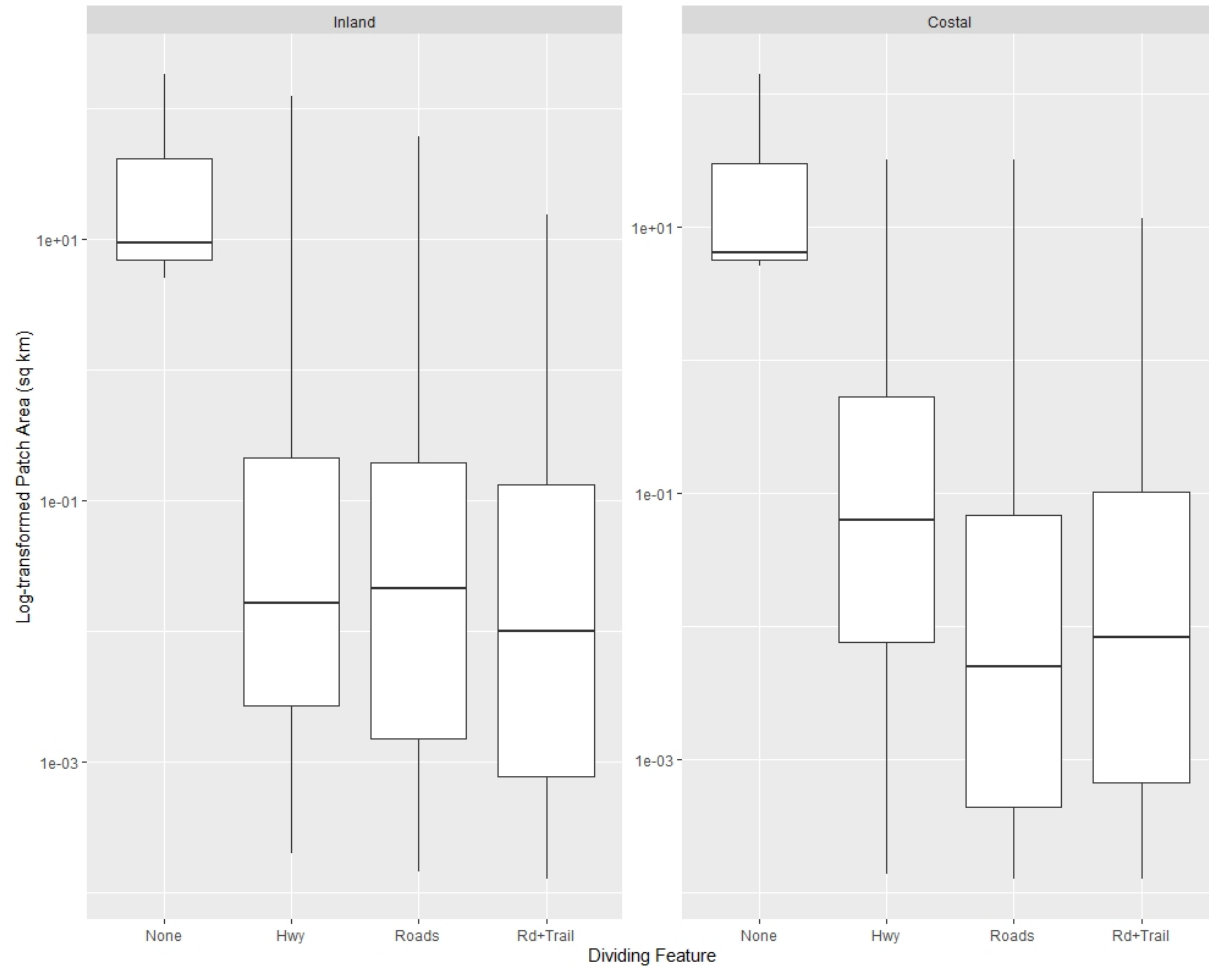
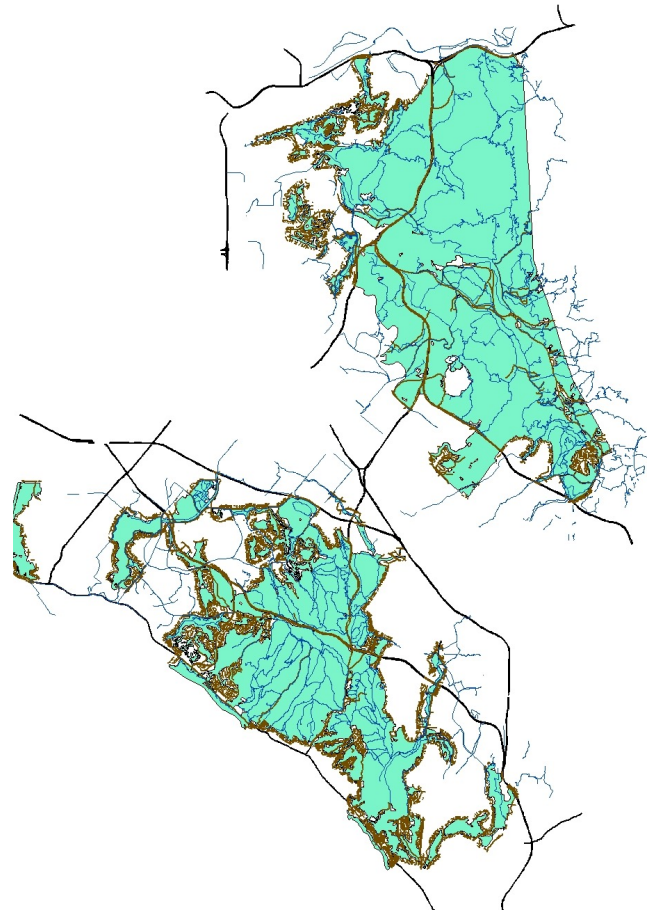
Habitat Analysis Approach

- Examination of resource conditions & potential for impacts to ecological resources
 - Existing vegetation maps & ecological data
 - Existing infrastructure & visitor use patterns
 - Combined social & ecological data
 - Application of new technologies

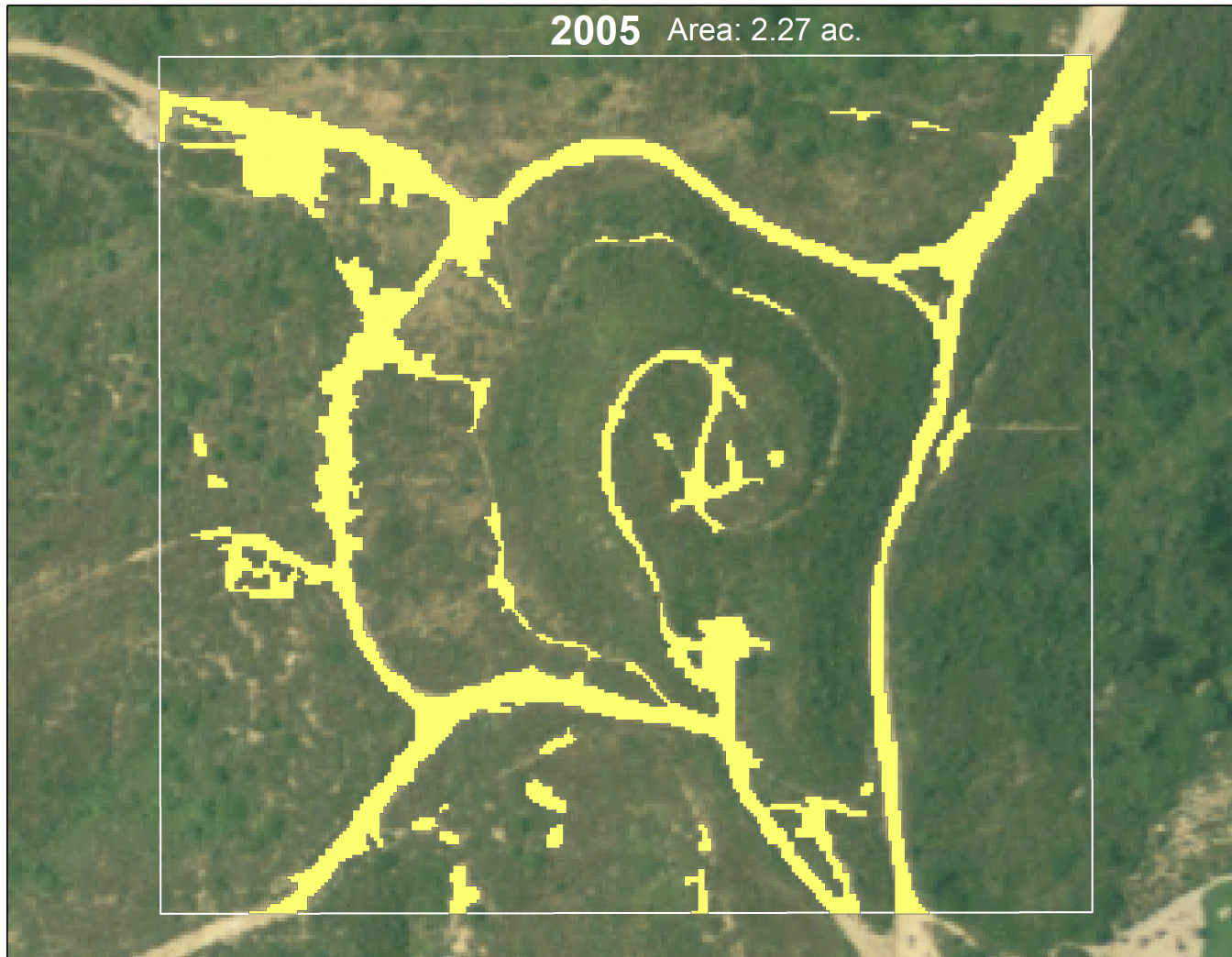
Applications across both spatial and temporal scales



Protected Area Level Fragmentation

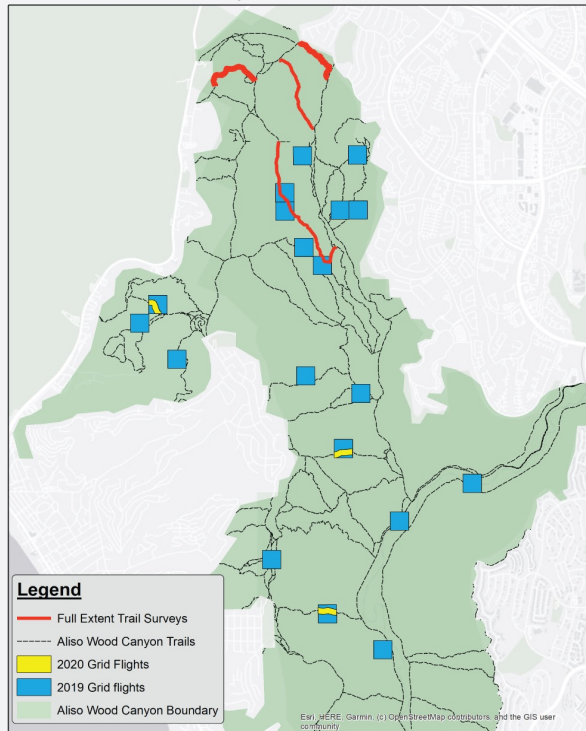


TOWO Landscape Change

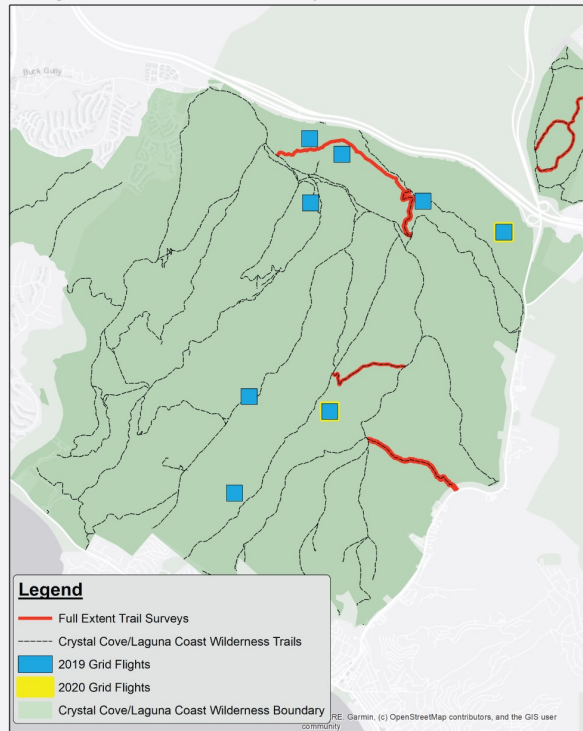


Rec. Resource Conditions

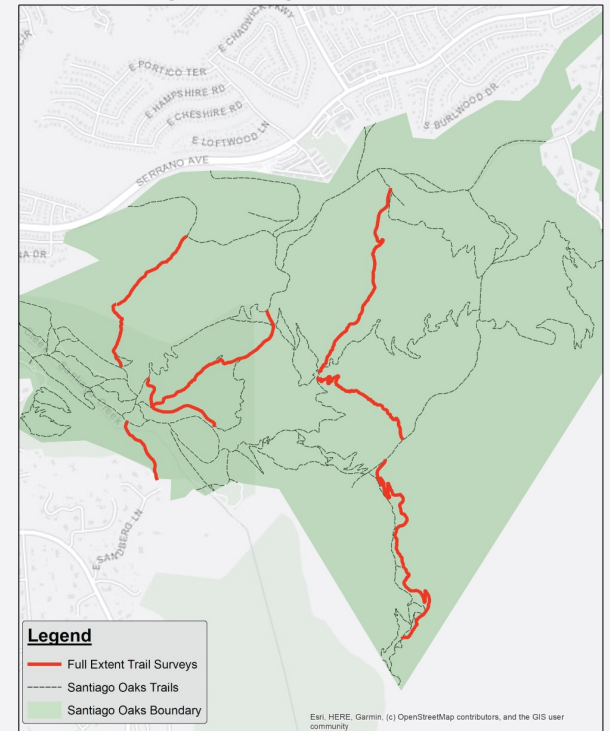
Aliso Wood Canyons Wilderness Drone Data



Laguna Coast Wilderness/Crystal Cove SP Drone Data



Santiago Oaks Regional Park Drone Data



Intersection with Sensitive Habitat

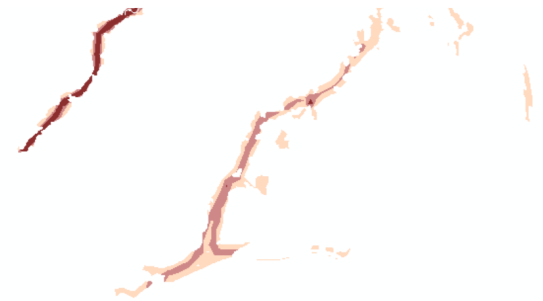
Nature Cluster &
Vegetation Layer



Select only sensitive
habitat categories

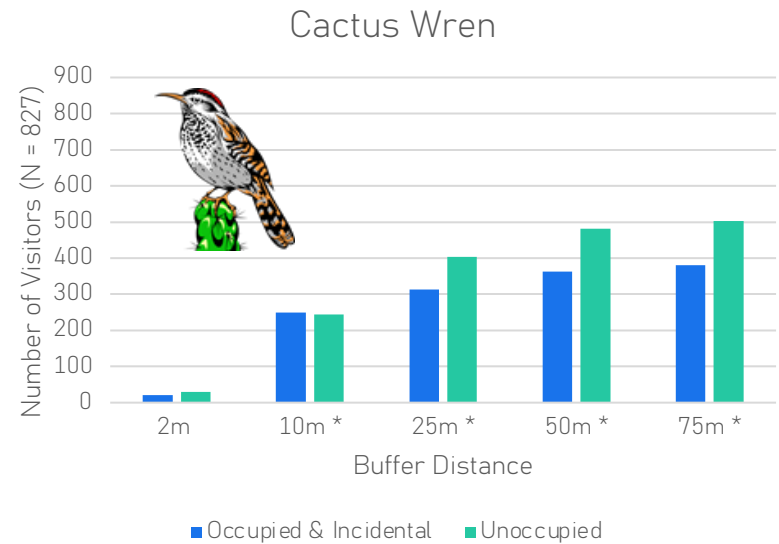
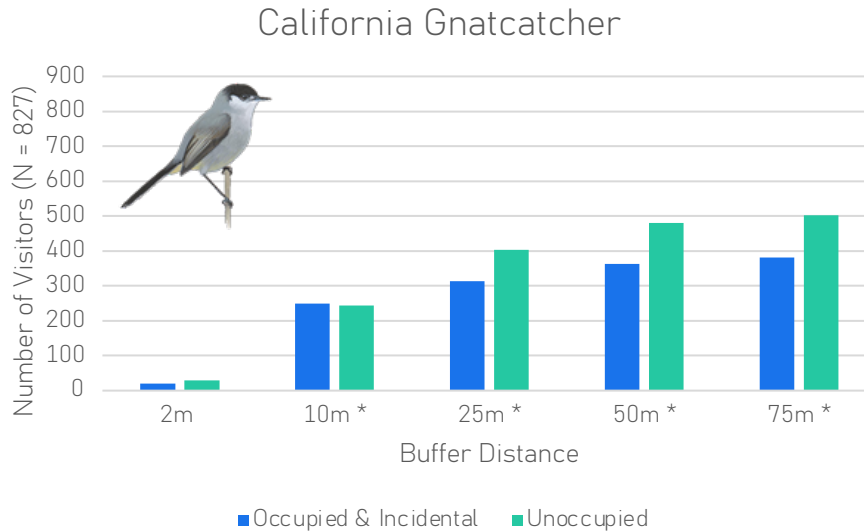


Intersect sensitive
habitat with
Nature Cluster



- California Maritime Chaparral Group
- Californian Coastal Sage Scrub Group
- Californian Seral Scrub Group
- Protected Oak Species
- Vegetation Restoration Zones

Intersection with Bird Surveys



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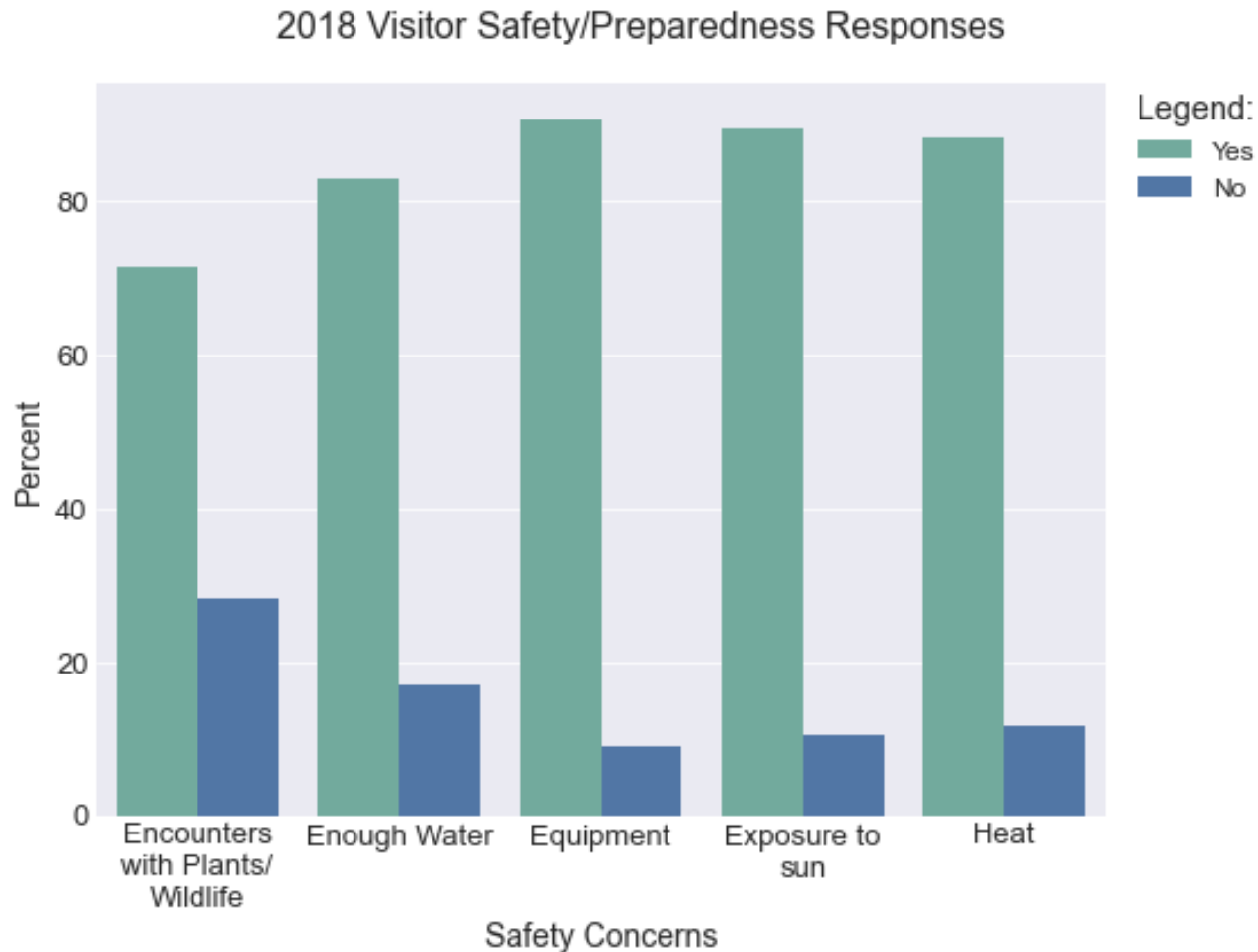


Exogenous Factors

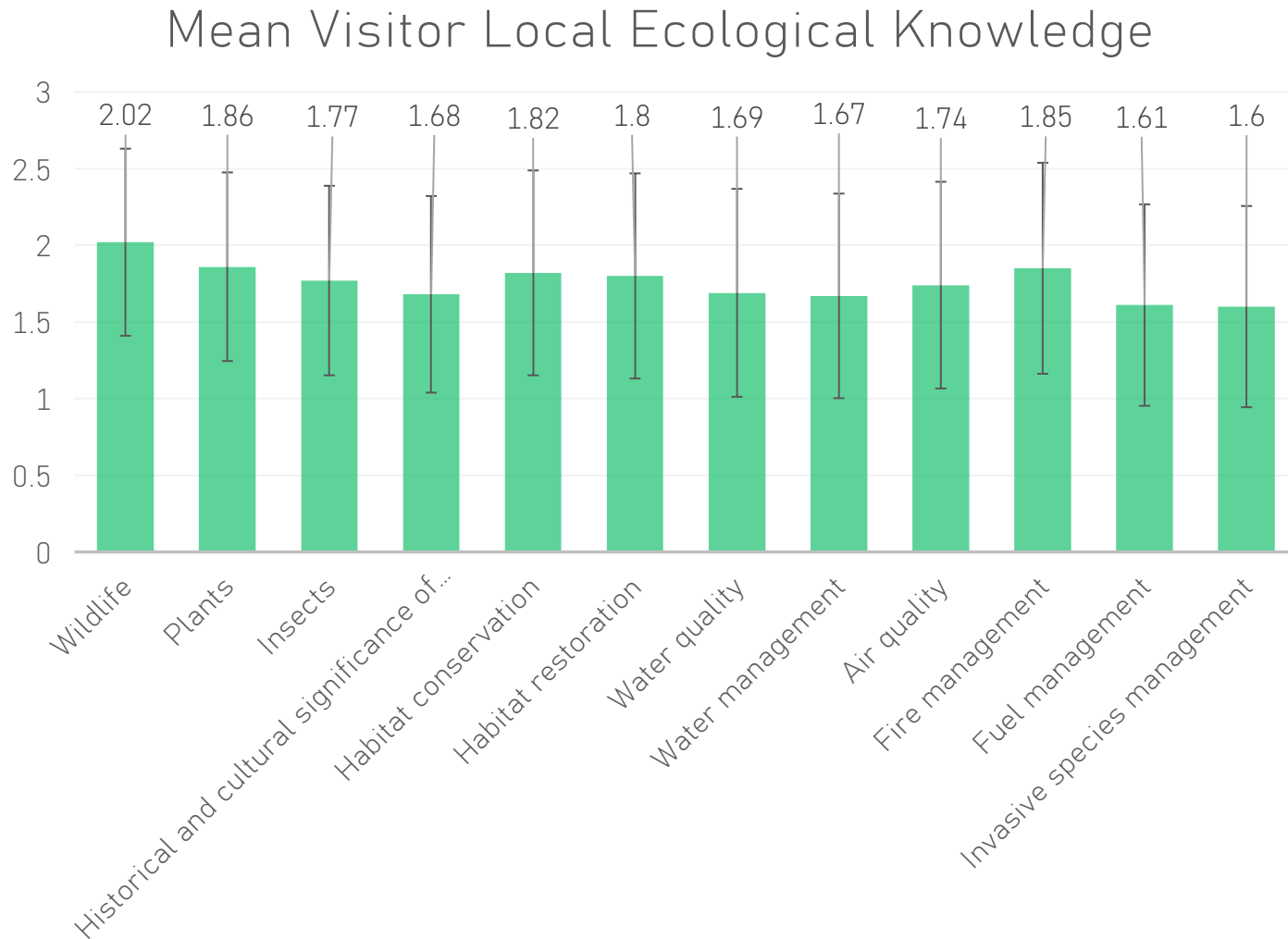


Recreation Management Frameworks

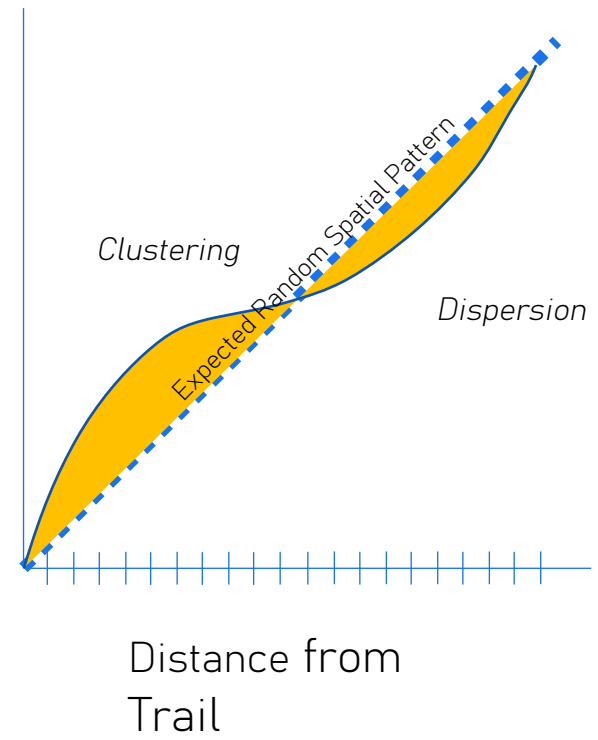
Preparedness/Safety



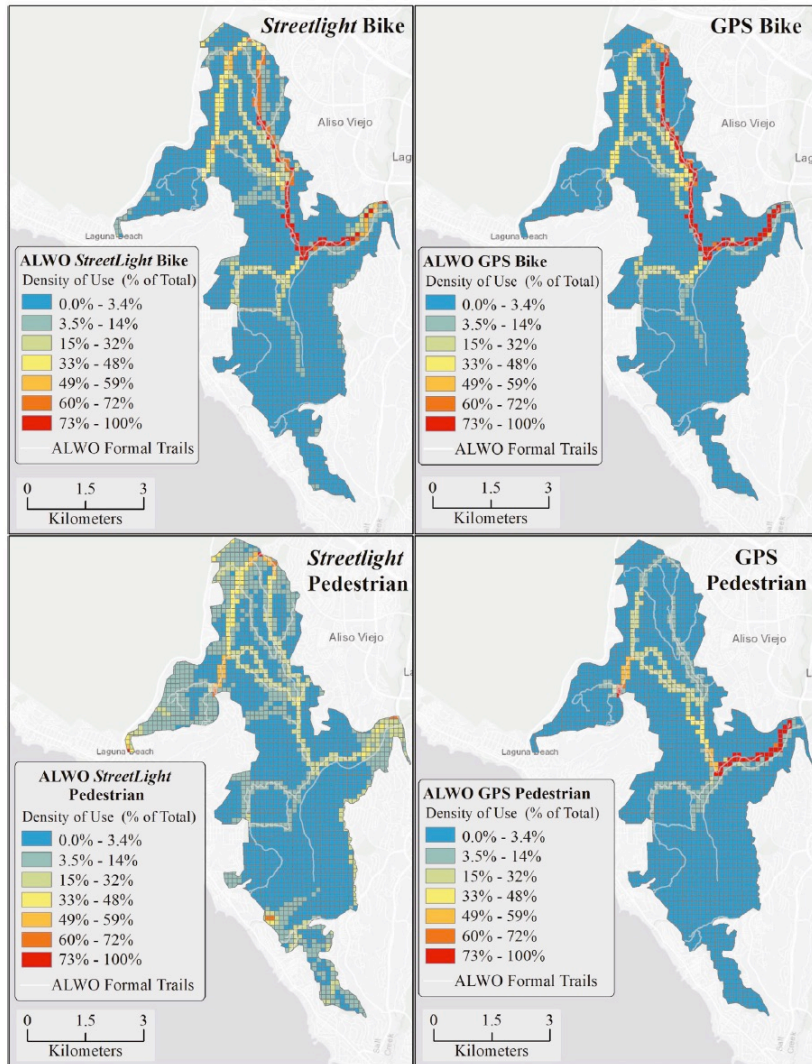
Knowledge of Fire & Invasive Species



Invasive Species

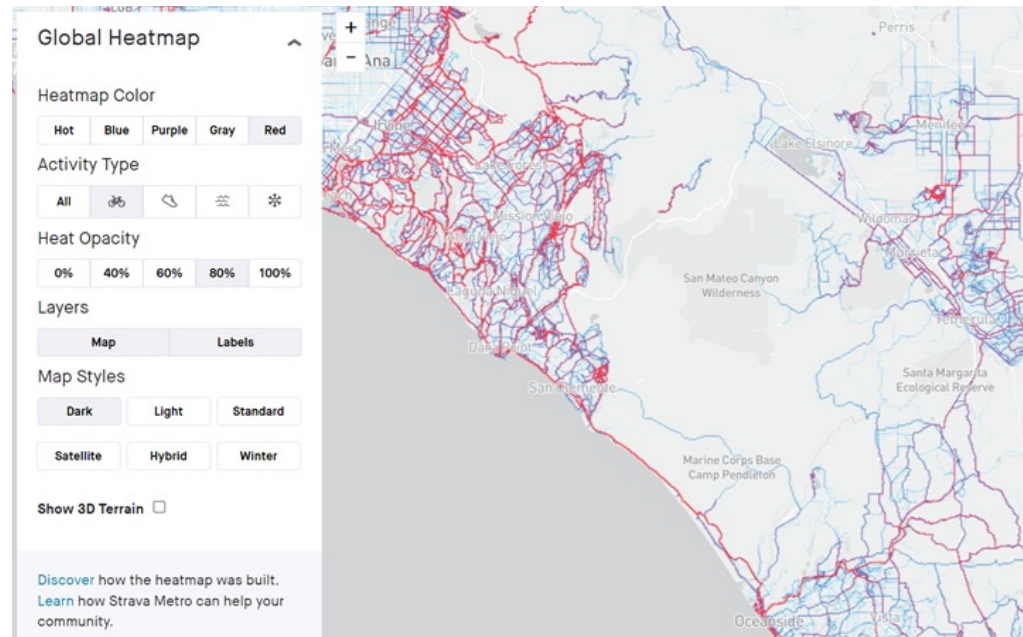


Future Research



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Model changes in recreation behavior & distributions, and associated impacts to vegetation and/or wildlife communities, under increasing visitor-use scenarios & changing climates.



200



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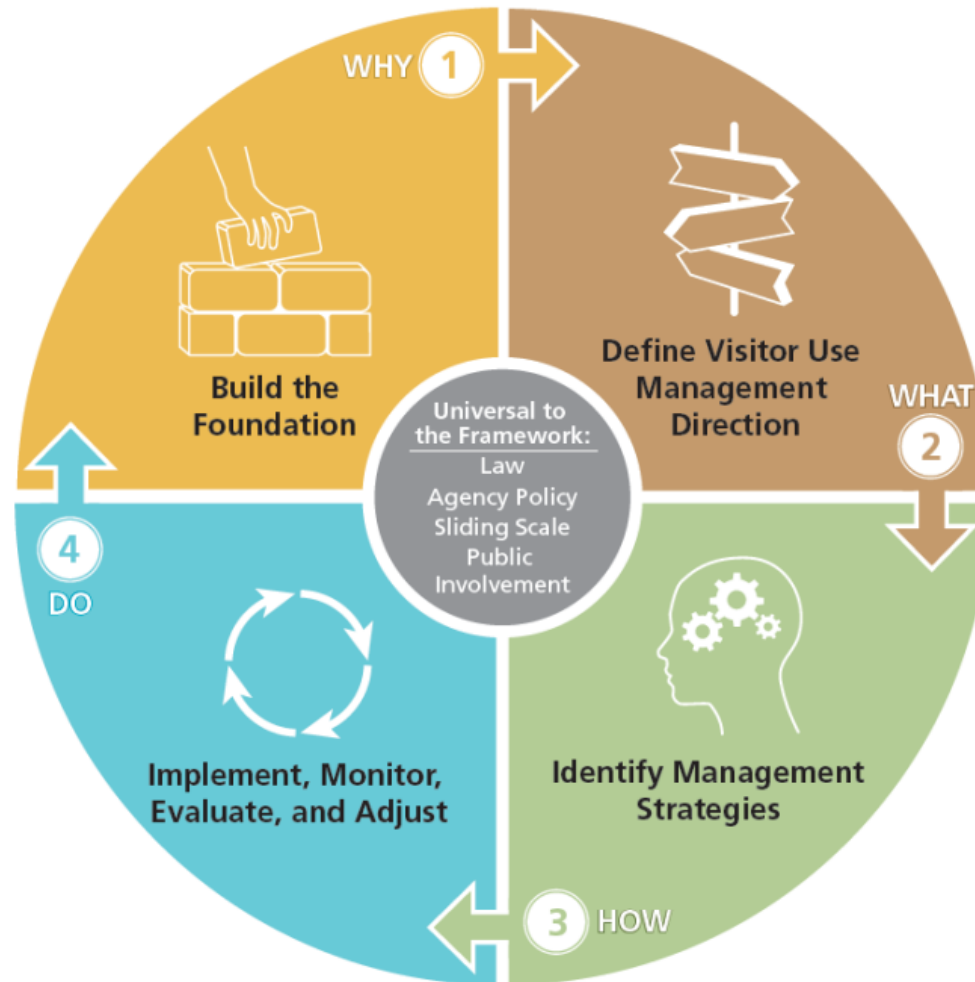


Recreation management planning frameworks

the **analytical elements** necessary to address recreation use management opportunities and issues, **consistent with applicable law, within existing agency management processes.**

Definition from Visitor Use Management Council: <https://visitorusemanagement.nps.gov/>

Figure 1. Overview of the Visitor Use Management Framework



Visitor Use Management Framework

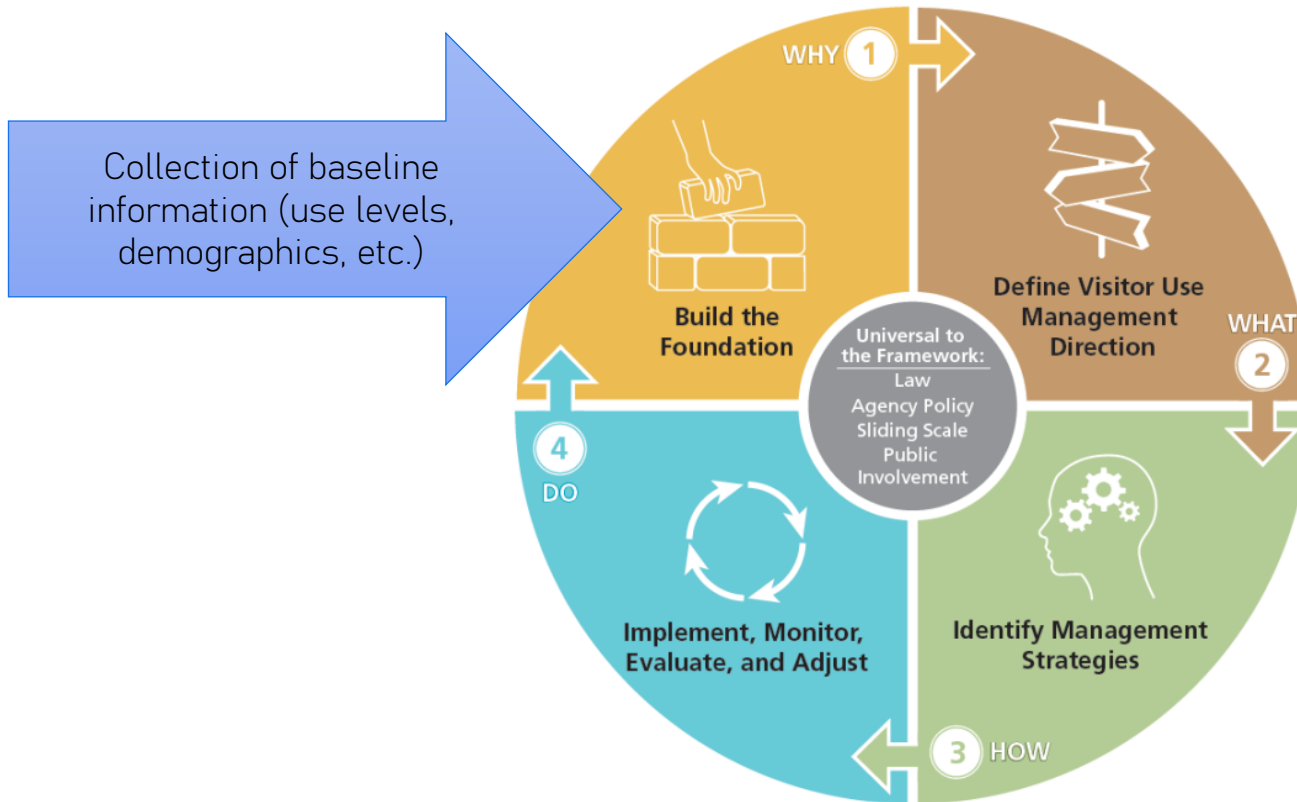
Build the Foundation (Why): What is the purpose and/or need? What issues are we facing? What issues can this plan address? What data and information do we have? What do we need?

Define Visitor Use Management Direction (What): What are our desired conditions?

Identify Management Strategies (How): What strategies can we use to achieve our desired conditions?

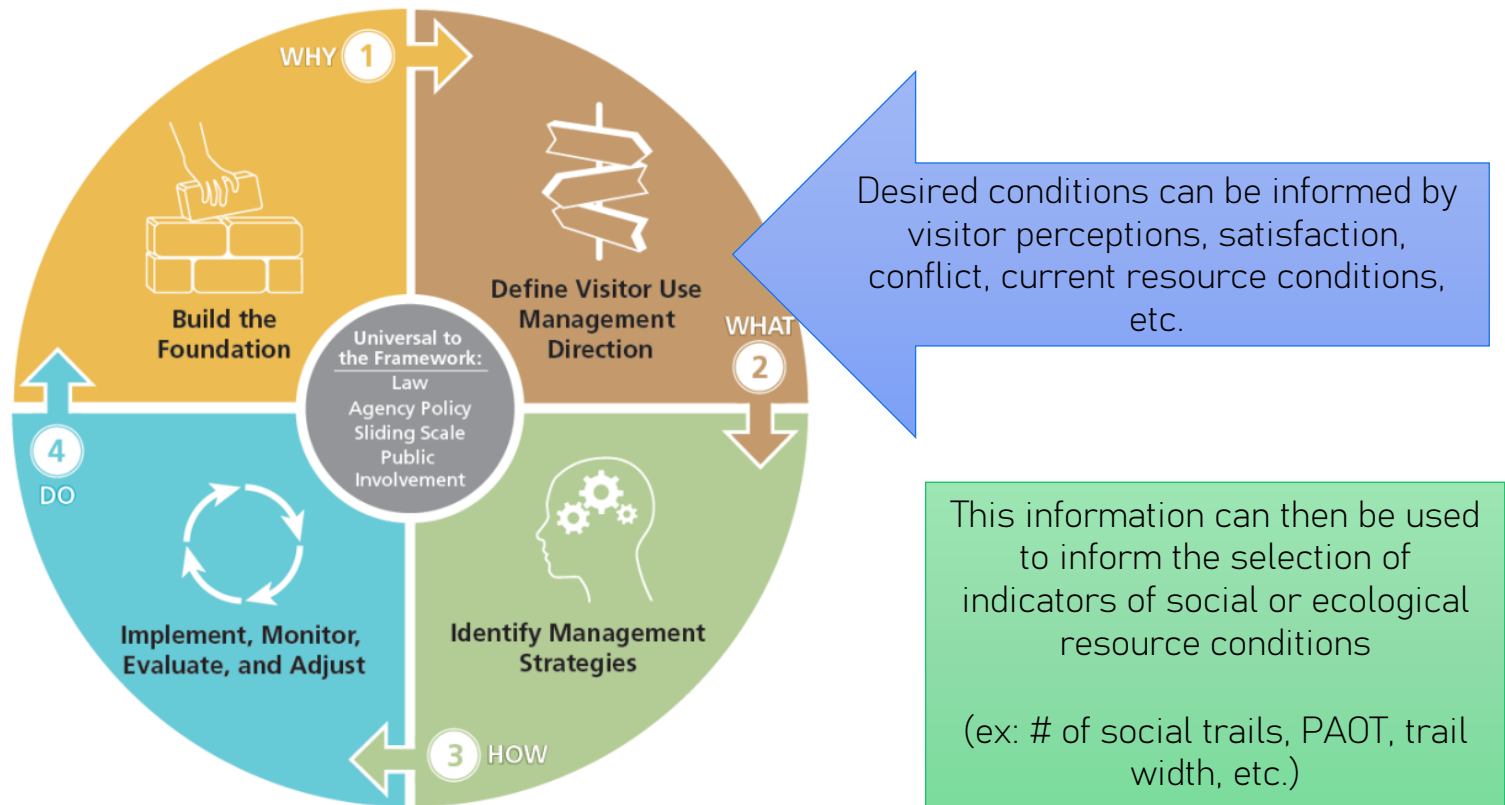
Implement, Monitor, Evaluate, and Adjust (Do): Implement management actions and adjust them based on monitoring data.

Figure 1. Overview of the Visitor Use Management Framework



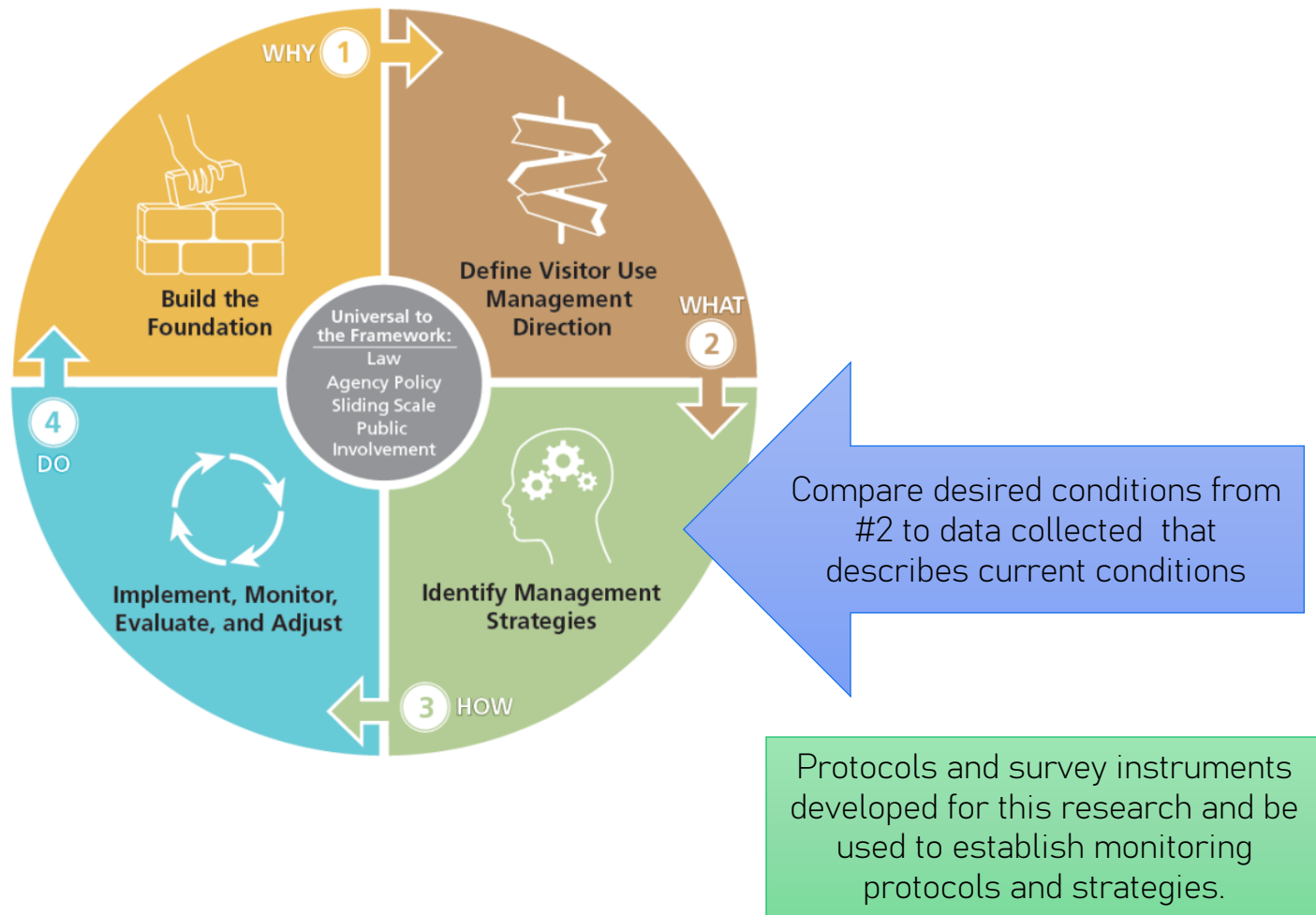
Baseline Data

Figure 1. Overview of the Visitor Use Management Framework



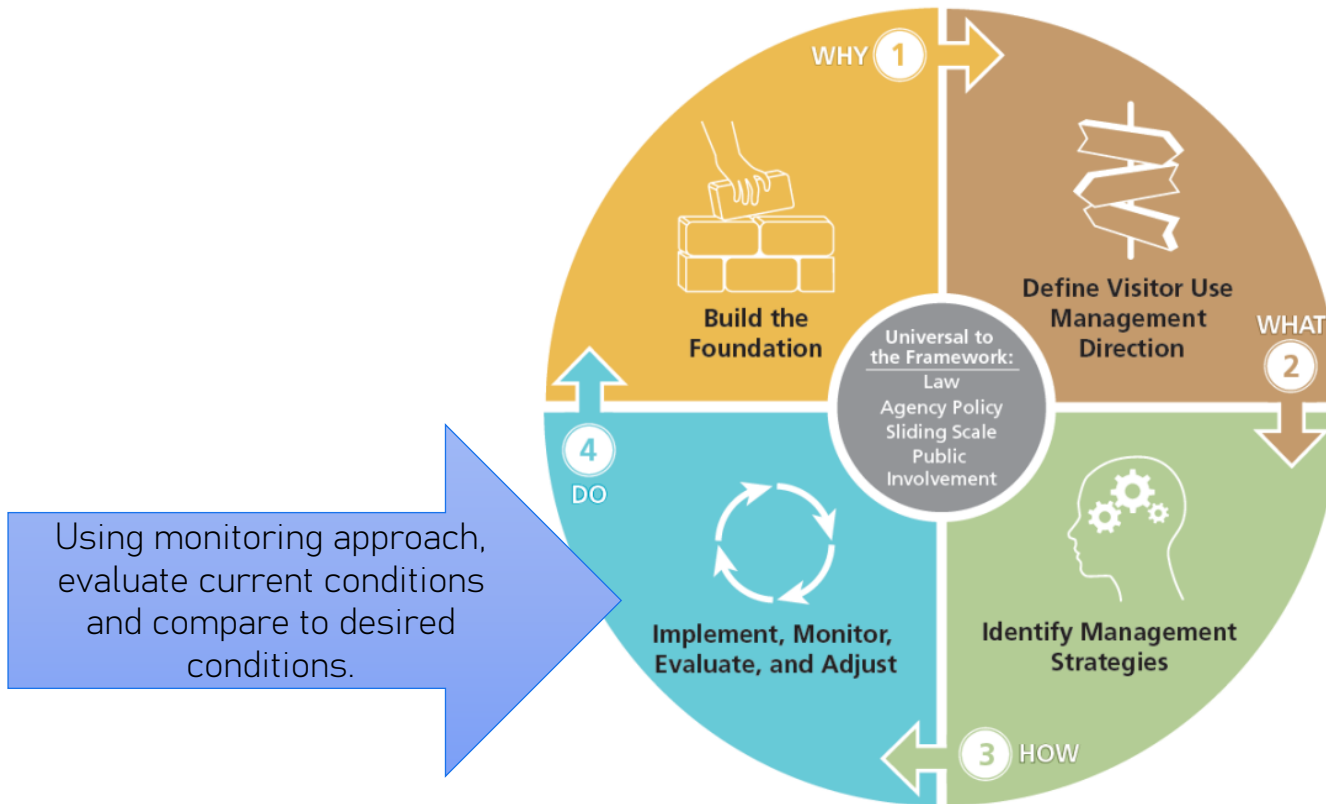
Indicators

Figure 1. Overview of the Visitor Use Management Framework



Monitoring

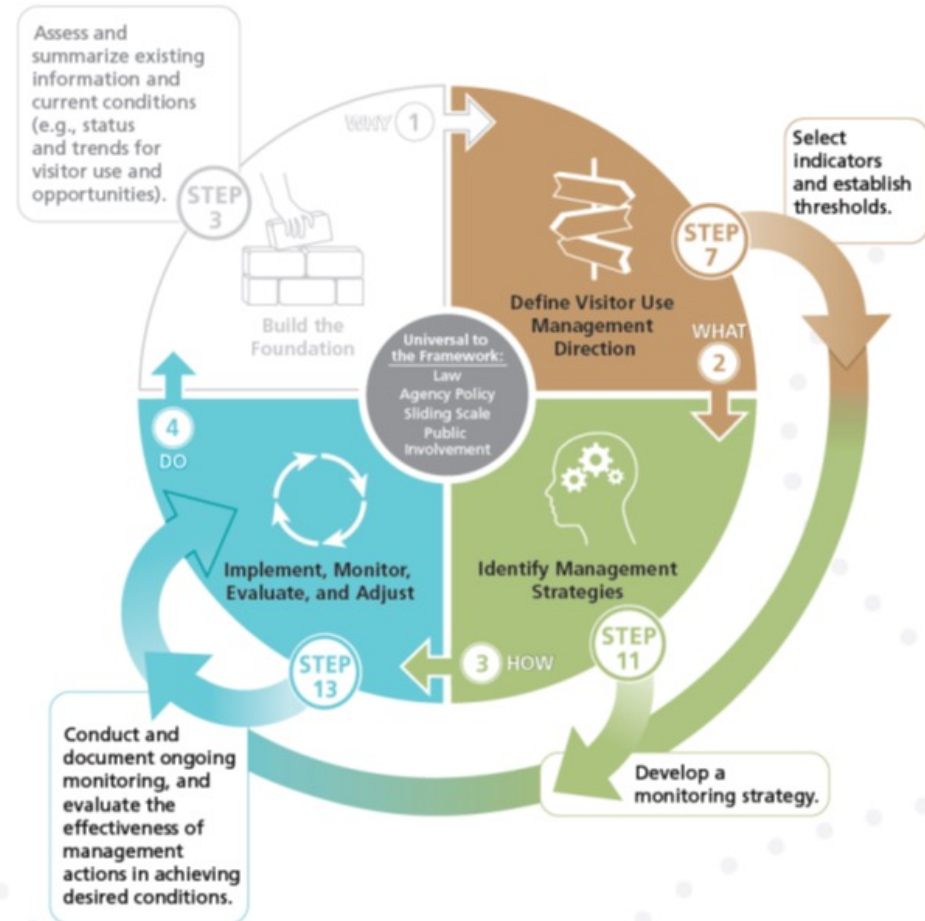
Figure 1. Overview of the Visitor Use Management Framework



Adaptive Management

Science-informed, adaptive management!

Using baseline data,
indicators and
thresholds, and
monitoring protocols to
evaluate the
effectiveness of
management actions to
achieved manager-
developed desired
conditions



Thank you!

