CENTRAL WASATCH VISITOR USE STUDY – PHASE II UPDATE

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INSTITUTE OF

OUTDOOR RECREATION AND TOURISM

UTAH STATE UNIVERSITY

ABOUT

- Founded in 1998 by the Utah State Legislature
- Housed in Extension
- Mission:
  1. Provide data for the Legislature and state agencies in their decision-making processes on issues relating to tourism and outdoor recreation
  2. Assist community officials as they attempt to balance the economic, social, and environmental tradeoffs in tourism development
  3. Lead interdisciplinary approach of research and study on outdoor recreation and tourism

SERVICES

Visitor Use Monitoring and Management

Mobile Location Analytics

Needs Assessments

Recreation Economics

OUTLINE

1. Objectives
2. Overview of the VUS
    1. Phase I – Scoping
    2. Phase II – Assessments
3. Phase I – Findings
4. Phase II – Data Collection
    1. Ecological and Physical Assessments
    2. Social Assessment
5. Phase II – Preliminary Results
6. Questions

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Our objectives are to provide the diverse set of stakeholders who use and value the canyons with a scientifically grounded understanding of:

1. the spatial and temporal dynamics of current and projected outdoor recreation use;
2. the extent to which outdoor recreation activity within the canyons affects key indicators of ecological and physical resource conditions; and
3. the likely changes in ecological and physical resource conditions under projected levels of use.

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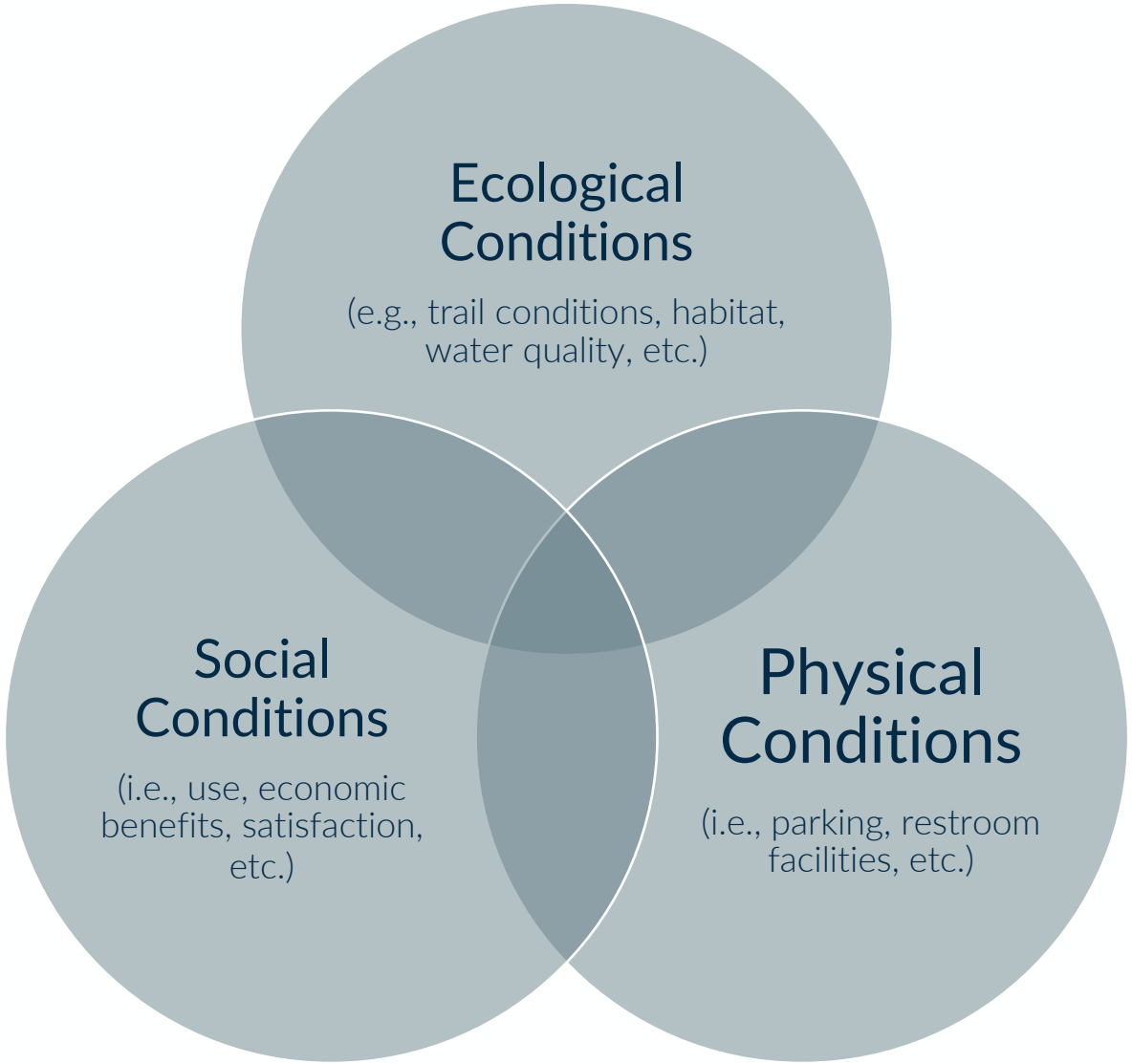

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INTERAGENCY
VISITOR USE MANAGEMENT
COUNCIL

Elements and steps of the Visitor Use Management Framework

Steps:

1. Clarify project purpose and need.
2. Review the area's purpose and applicable legislation, agency policies, and other management direction.
3. Assess and summarize existing information and current conditions.
4. Develop a project action plan.

Outcome: Understand why the project is needed, and develop the project approach.

Steps:

5. Define desired conditions for the project area.
6. Define appropriate visitor activities, facilities, and services.
7. Select indicators and establish thresholds.

Outcome: Describe the conditions to be achieved or maintained and how conditions will be tracked over time.

Steps:

8. Compare and document the differences between existing and desired conditions, and, for visitor use-related impacts, clarify the specific links to visitor use characteristics.
9. Identify visitor use management strategies and actions to achieve desired conditions.
10. Where necessary, identify visitor capacities and additional strategies to manage use levels within capacities.
11. Develop a monitoring strategy.

Outcome: Identify strategies to manage visitor use to achieve or maintain desired conditions.

Steps:

12. Implement management actions.
13. Conduct and document ongoing monitoring, and evaluate the effectiveness of management actions in achieving desired conditions.
14. Adjust management actions if needed to achieve desired conditions, and document rationale.

Outcome: Implement management strategies and actions, and adjust based on monitoring and evaluation.

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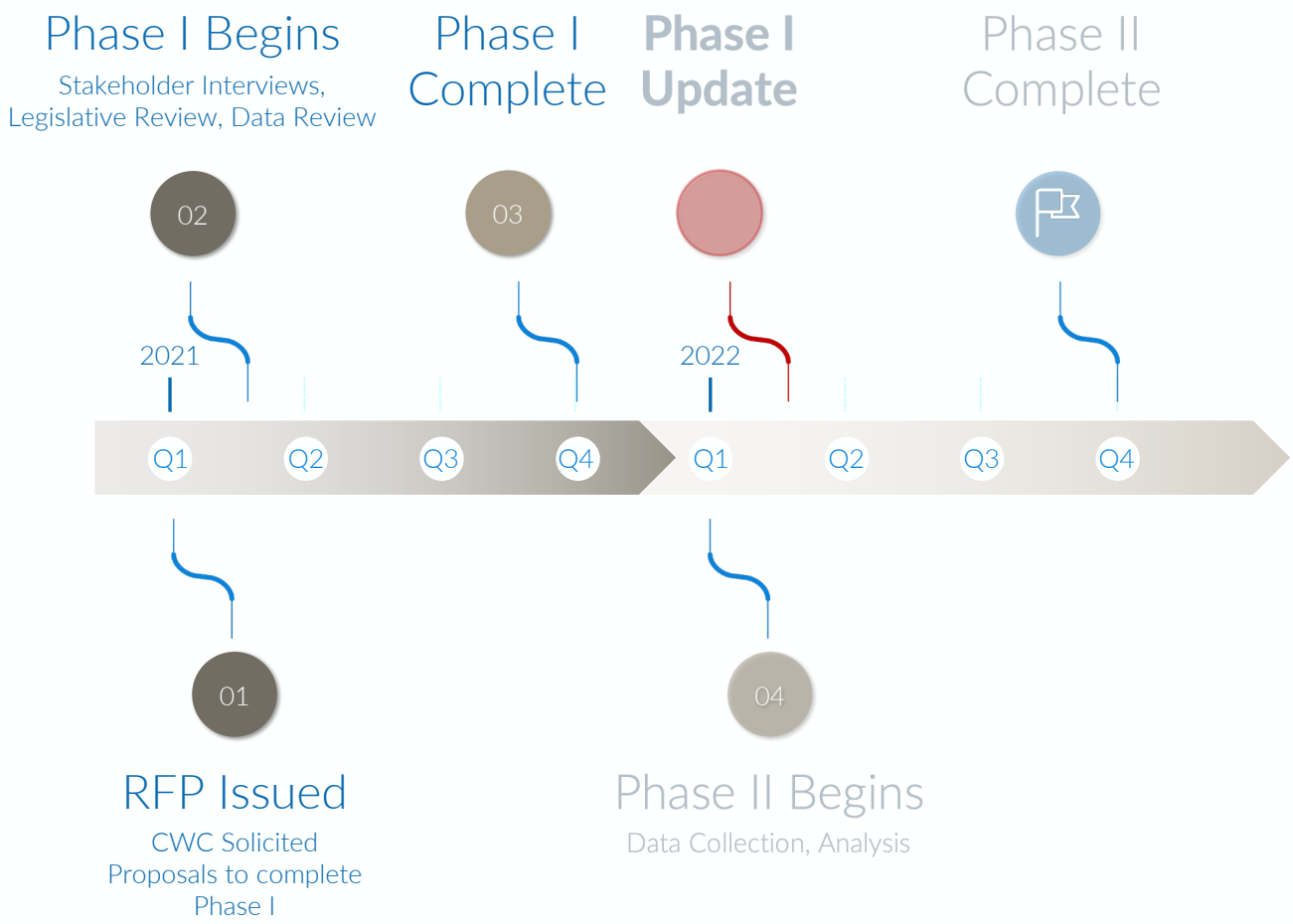

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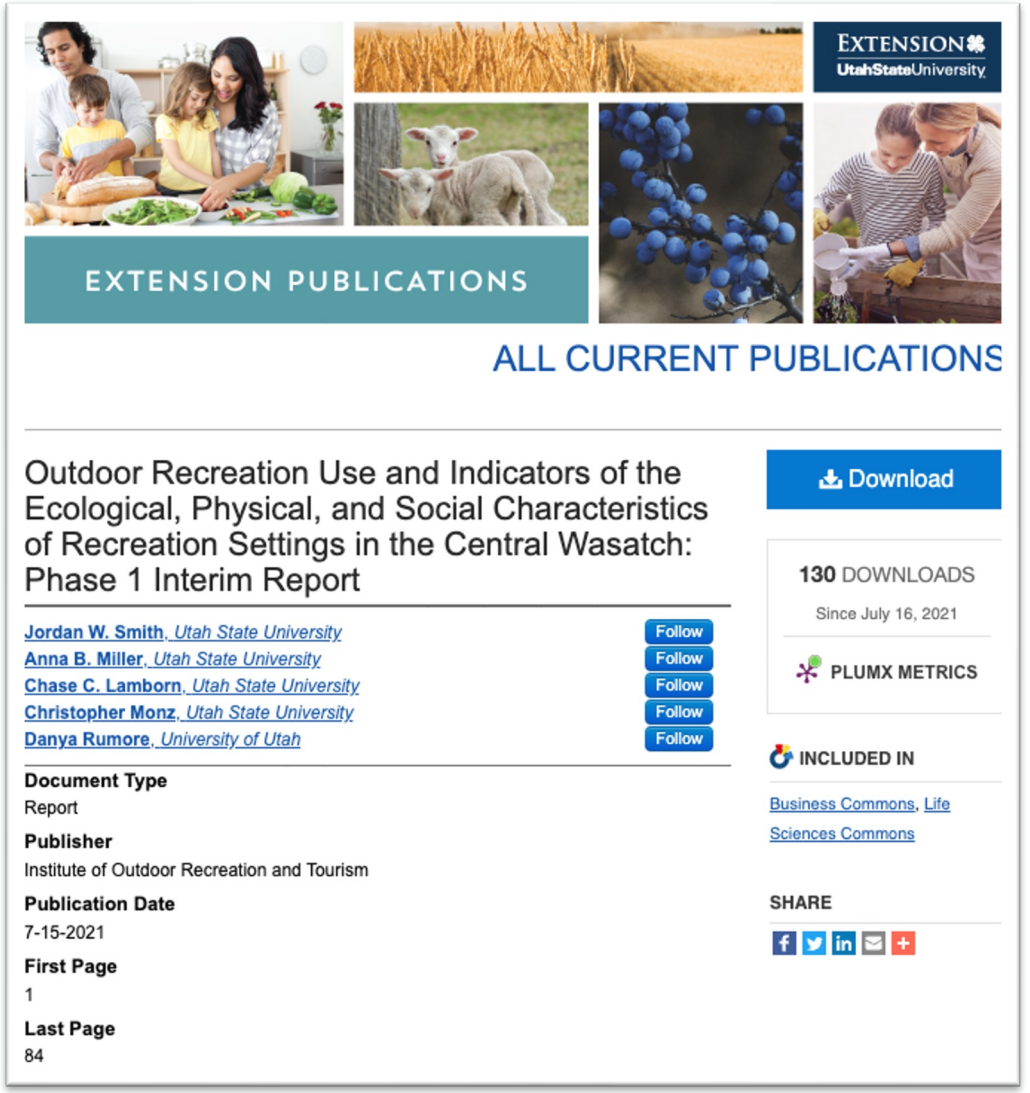

Phase 1 Report Available Here:
https://digitalcommons.usu.edu/extension_curall/2206/

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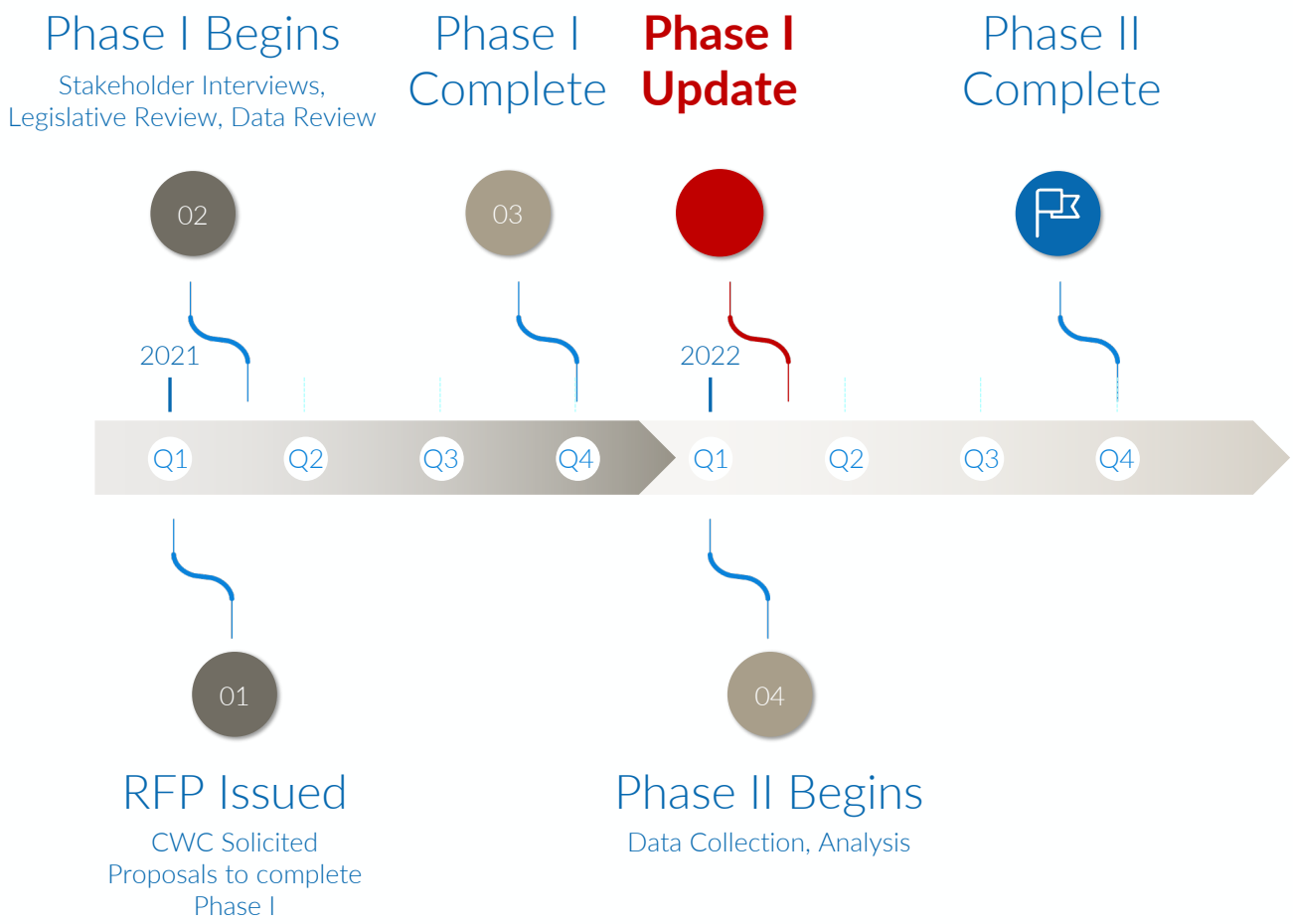

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Trails
- Informal trail proliferation and condition
- Trail condition
    - Trail width; linear extent
    - Trail condition class; linear extent
    - Trail depth (incision); linear extent

Areas around high elevation lakes
- Disturbed shoreline

Backcountry campsites
- Campsite proliferation; campsite number and location
- Campsite area
- Campsite condition

Water bodies
- Water quality
    - E. coli/coliforms; counting of indicator organisms
    - Nitrate
    - Dissolved organic Carbon
    - Particulate Carbon
    - Suspended sediment
    - Total dissolved Nitrogen

Access points (i.e., parking areas)
- Roadside vegetation disturbance
- Parking
    - Developed and roadside parking use
    - Average time a car is parked

Rock climbing areas

Quantify

Examine relationships with use
- Infrared trail counters
- Trail cameras
- Pneumatic traffic counters
- Mobile location data

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GOALS OF PHASE II

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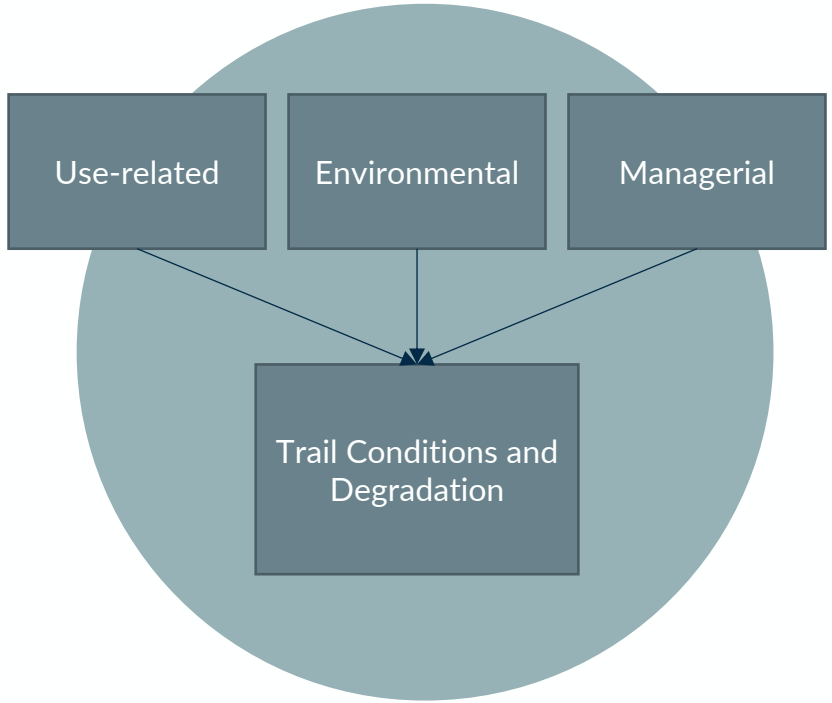

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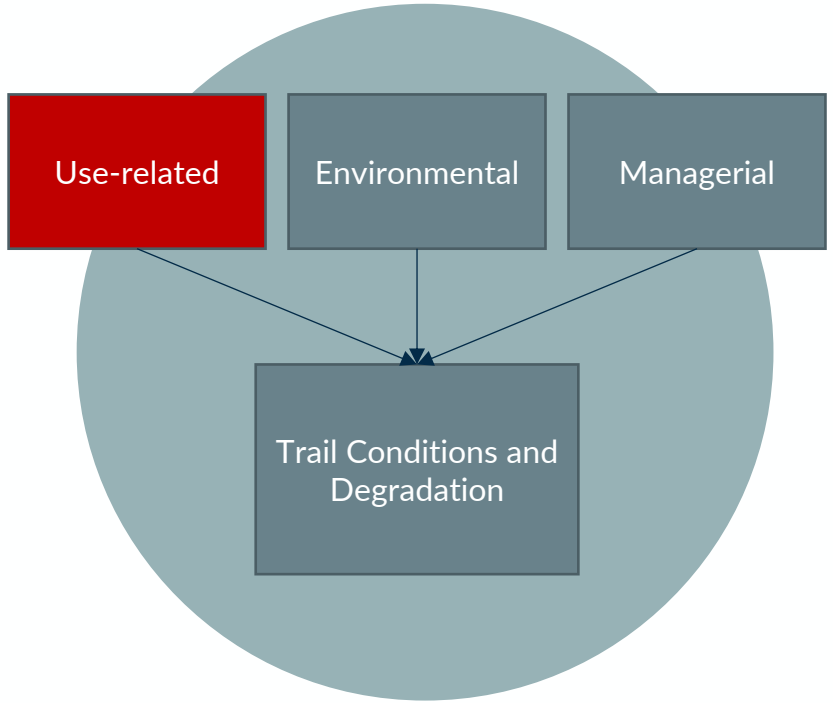

What data do we have regarding trail use?

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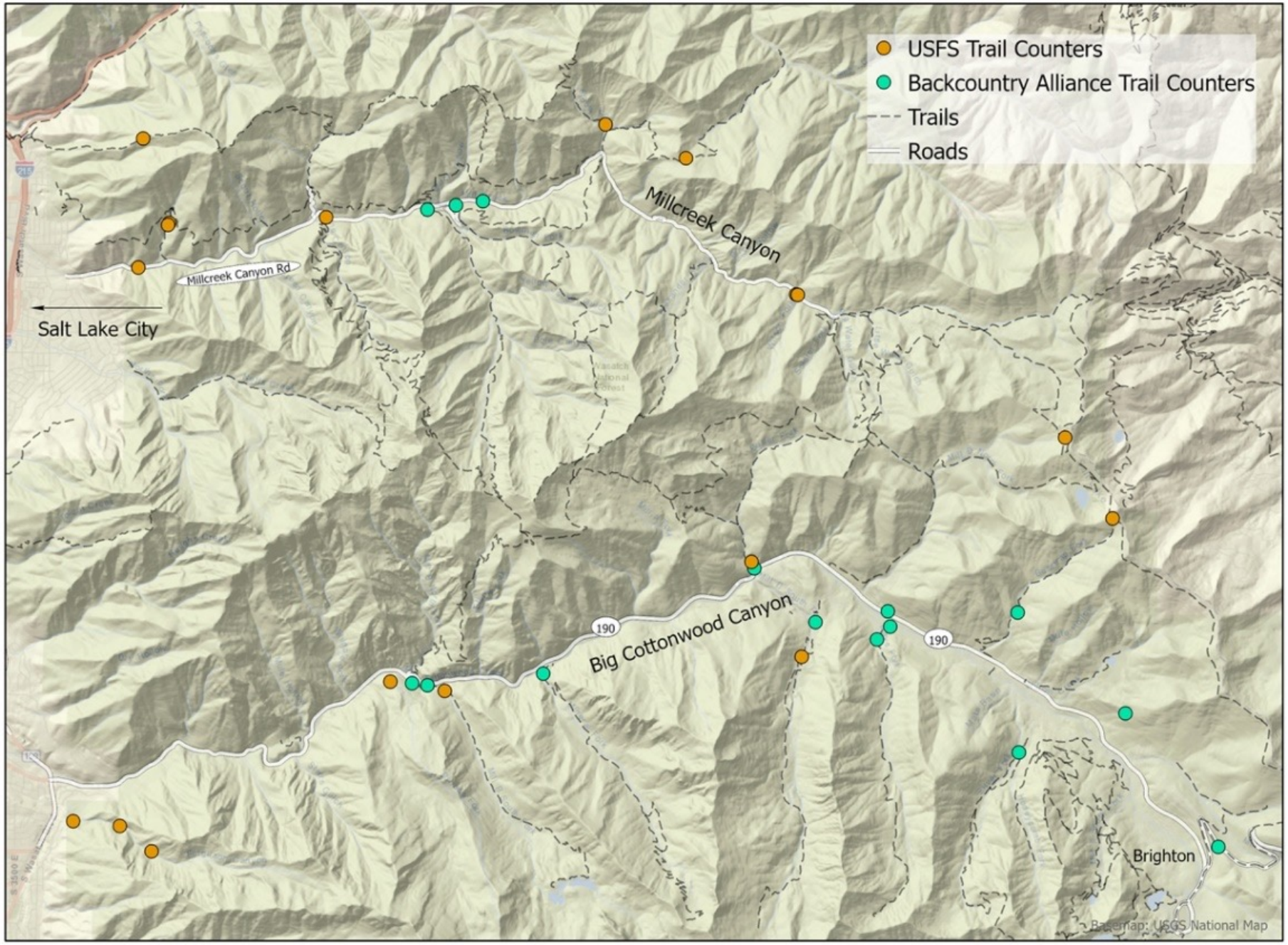

Trail Counter Locations, Millcreek and Big Cottonwood Canyon

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Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avarage Daily Traffic	Days with data
2017	BCC Butler													1191	38.429	14
2017	BCC Cardiff													4874	157.241	29
2017	BCC Mill D													1456	46.966	29
2017	LCC Our Lady													909	29.321	28
2018	BCC Butler	1449	1409	1067	1288									1377	43.301	133
2018	BCC Cardiff	6483	4958	5972	12656									3638	221.257	148
2018	BCC Mill D	3266	2953	2148	451									3824	84.385	148
2018	LCC Our Lady	1557	1282	221	0									2300	33.157	127
2018	LCC Our Lady East													1426	46	30
2018	LCC Summer Road	7714	4262	5688	3716									7511	190.538	119
2018	LCC Summer Road 2													248	8	30
2018	LCC White Pine													3785	122.1	30
2018	MCC Porter													4083	131.7	30
2018	MCC Road													16940	546.467	30
2019	BCC Bear Trap													1721	55.5	24
2019	BCC Butler	1237	872	457	240	54								1980	30.708	154
2019	BCC Cardiff	5775	5613	5567	1768	264								1891	133.379	153
2019	BCC Days Fork													1542	49.733	30
2019	BCC Mill B South													1196	38.583	24
2019	BCC Mill D	3889	3324	1869	632	16								4724	92.779	154
2019	BCC Mineral Fork													1261	40.667	30
2019	BCC Silver Fork													841	27.138	29
2019	BCC Willow Heights													1661	53.586	29
2019	LCC Gate Buttress				3883	3648	3784	1981							117.713	101
2019	LCC Our Lady	2178	1486	2368	1660	775								1870	62.432	148
2019	LCC Our Lady East	1644	1982	2281	1245	814								1838	58.649	148
2019	LCC Summer Road	7752	6486	8945	5267	4146								8546	240.547	148
2019	LCC Summer Road 2	140	1735	3626	3883	3648	3784	1981							90.492	187
2019	LCC White Pine	3936	3312	4159	2158	2240								4248	115.831	148
2019	MCC Porter	4764	3469	3234	1062	636								3829	107.183	153
2019	MCC Road	15902	13470	11342	4548	3441								16280	403.686	153
2020	BCC Bear Trap	2104	1562	2021	2569	140						210	927	51.214	182	
2020	BCC Butler	663	275	108	483	1067	930					0	8	14.243	185	
2020	BCC Cardiff	5062	7372	8524	13235	1866	60					240	608	198.254	185	
2020	BCC Days Fork	1830	1285	1449	2195	1080	1590					450	1541	51.07	185	
2020	BCC Mill B South	1091	1062	2238	4912	14157	48180					3077	2372	146.948	193	
2020	BCC Mill D	5282	3486	2837	1033	636	510					840	3381	90.27	185	
2020	BCC Mineral Fork	2031	1346	3348	867	3526	32940					960	696	69.968	185	
2020	BCC Silver Fork	1146	742	971	356	101						150	859	26.064	157	
2020	BCC Willow Heights	1410	922	1635	482	329						120	736	30.203	182	
2020	LCC Our Lady	2535	1725	1686	827							663	1122	51	156	
2020	LCC Our Lady East	1902	874	1417	751							820	1058	39.25	156	
2020	LCC Summer Road	8248	7637	11430	3761							15263	13845	313.288	156	
2020	LCC White Pine	4785	4080	5086	3743							2117	2660	130.545	156	
2020	MCC Porter	4996	4485	3402	2100	4055						2267	6405	136.669	172	
2020	MCC Road	17597	14142	13417	7844	10470						7700	15949	435.895	172	
2020	USFS BCC Blanche01							18153	15429	15997	14872			520.936	109	
2020	USFS BCC Broads							876	463	1773	2032			41.853	109	
2020	USFS BCC Butler							7119	6358	4681	4544			182.587	109	

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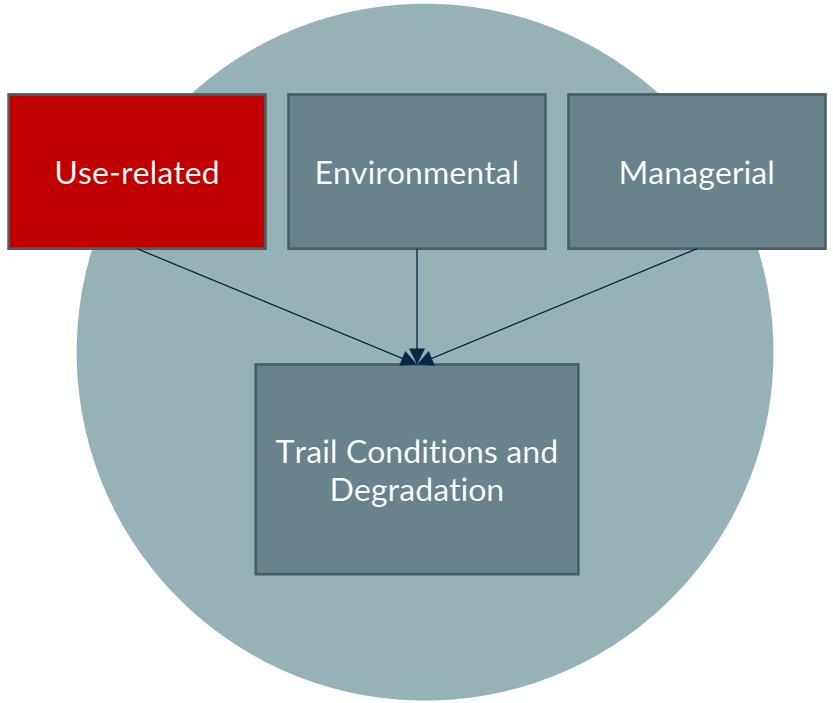

What data do we have regarding trail use?

- Existing trail counter data is useful, but not comprehensive or consistent

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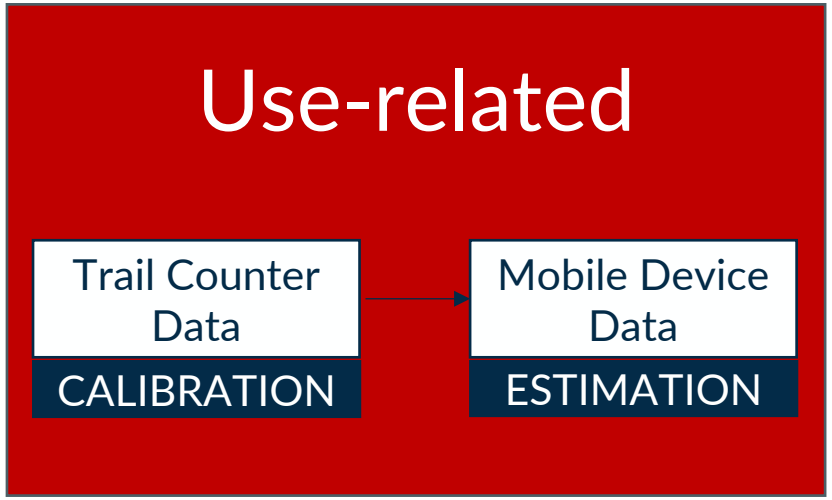

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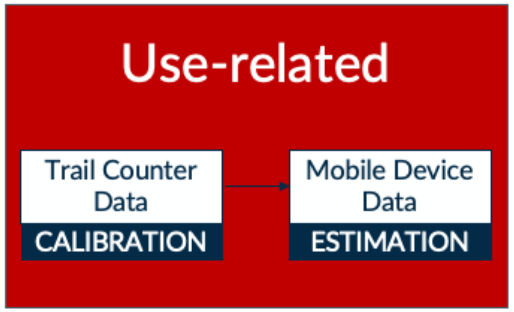

- Statistical model that predicts trail use across the Central Wasatch
- Predictors of use include:
    - Canyon (MCC, BCC, LCC)
    - Month
    - Weekend (Sat & Sun)
- Allows use estimation for all trail counter locations for all times of the year

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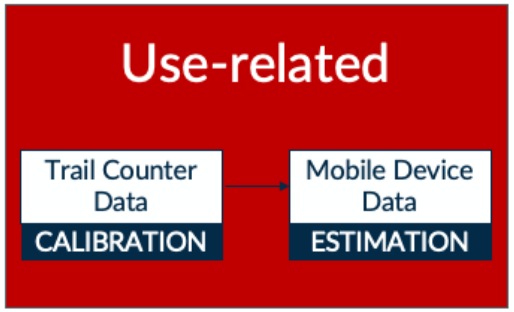

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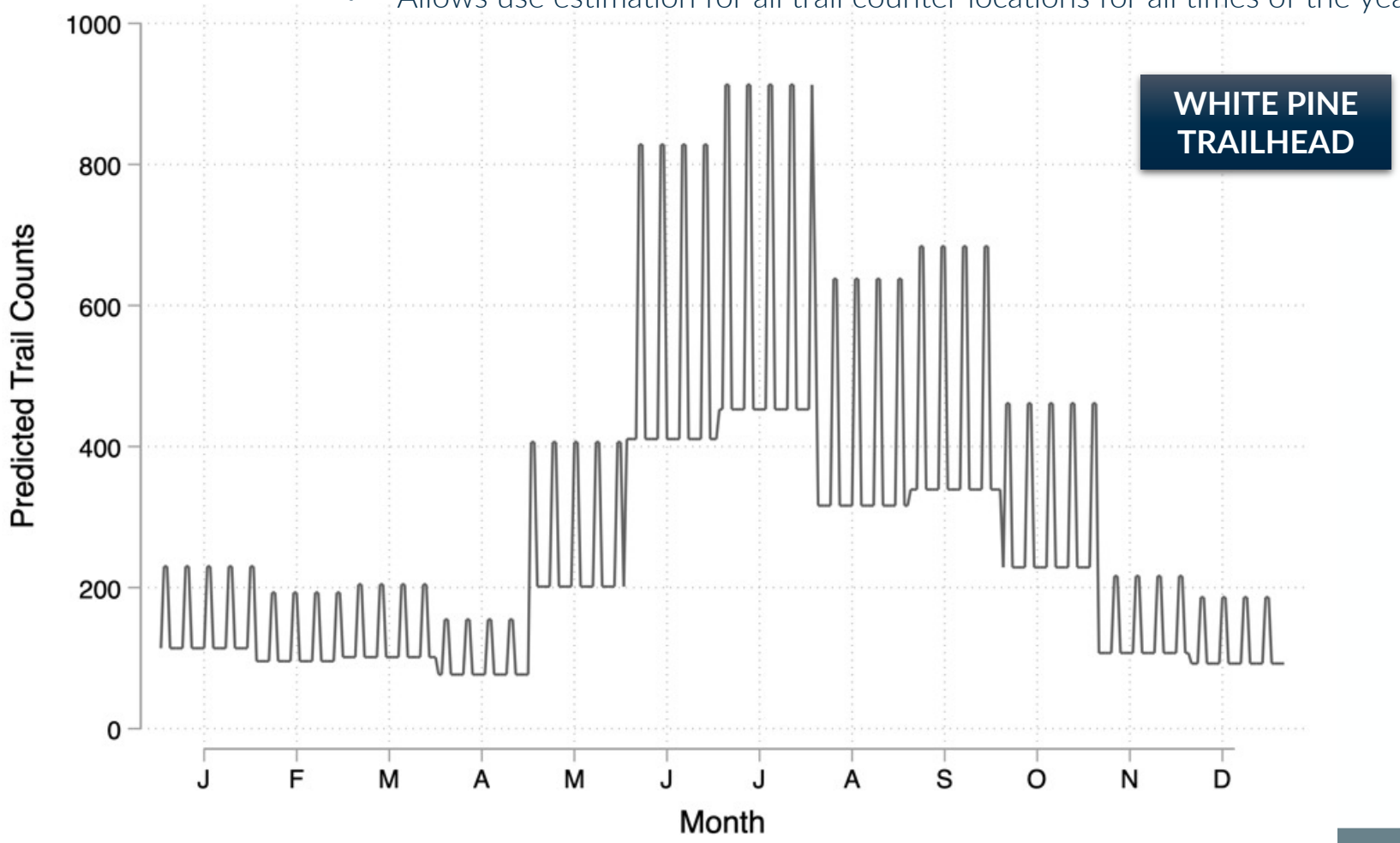

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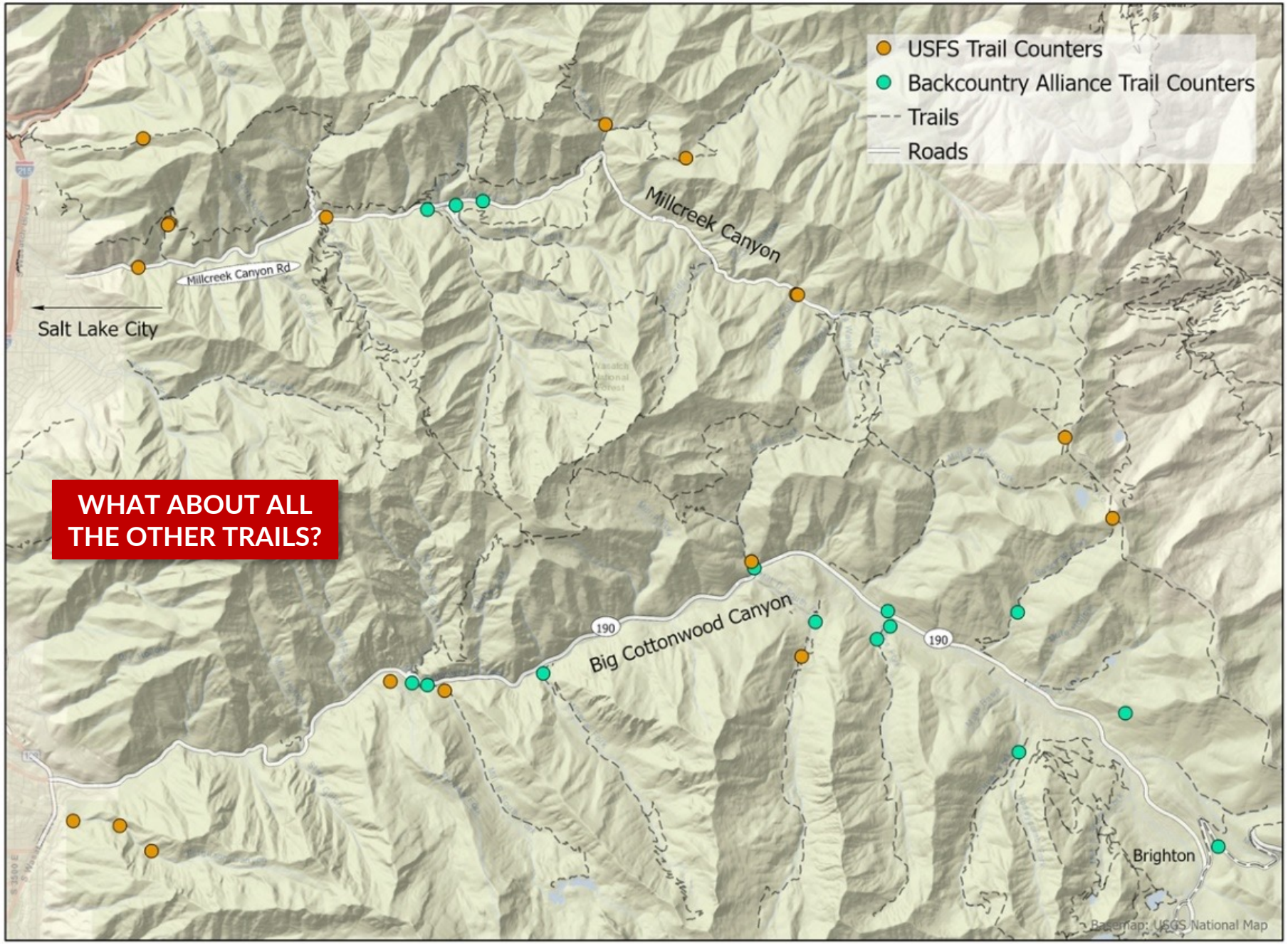

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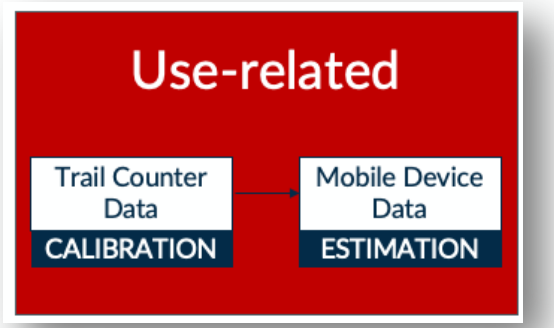

- Smartphone Apps have Location Based Services (LBS) installed on them
- LBS collect geographic data on the position and movement of the phone
- We can use these data to estimate use on trails, and at other destinations, where counters are not located

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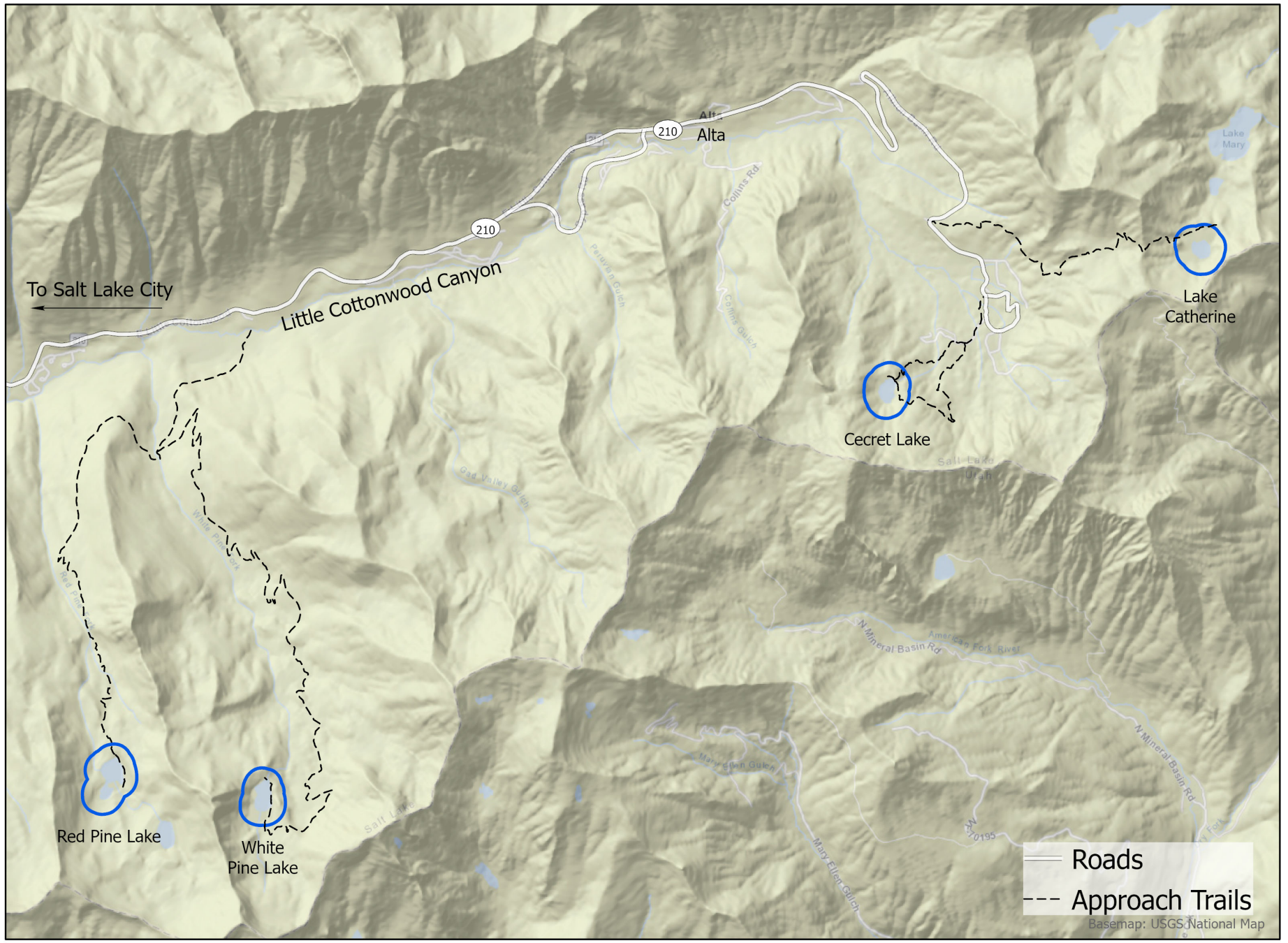

Lakes and Approach Trails, Little Cottonwood Canyon

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- We have established zones (i.e., geofences) at all formal and informal trails leading to White Pine, Red Pine, Cecret, and Catherine.
- This allows us to quantify and visualize use patterns around the lakes.

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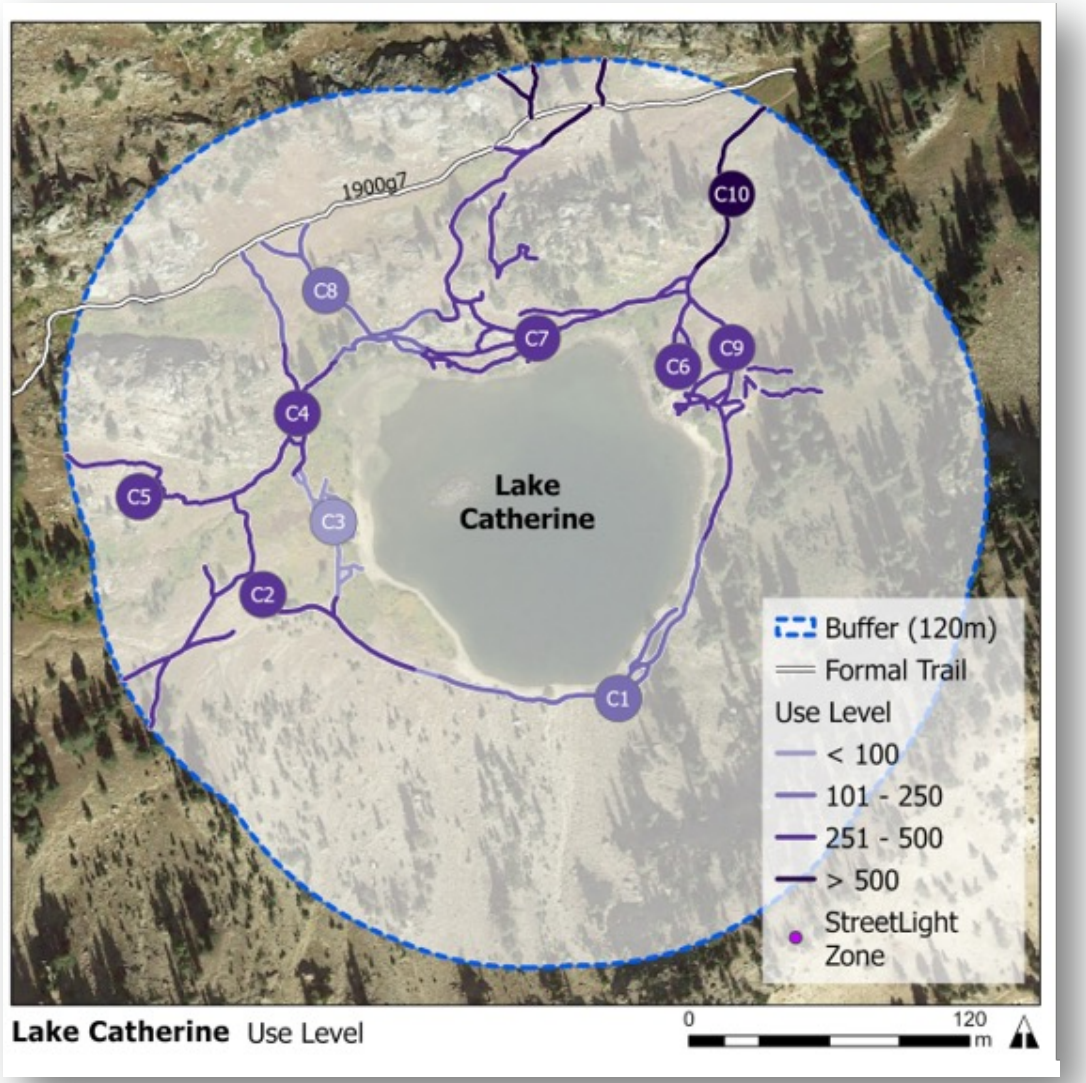

LAKE CATHERINE

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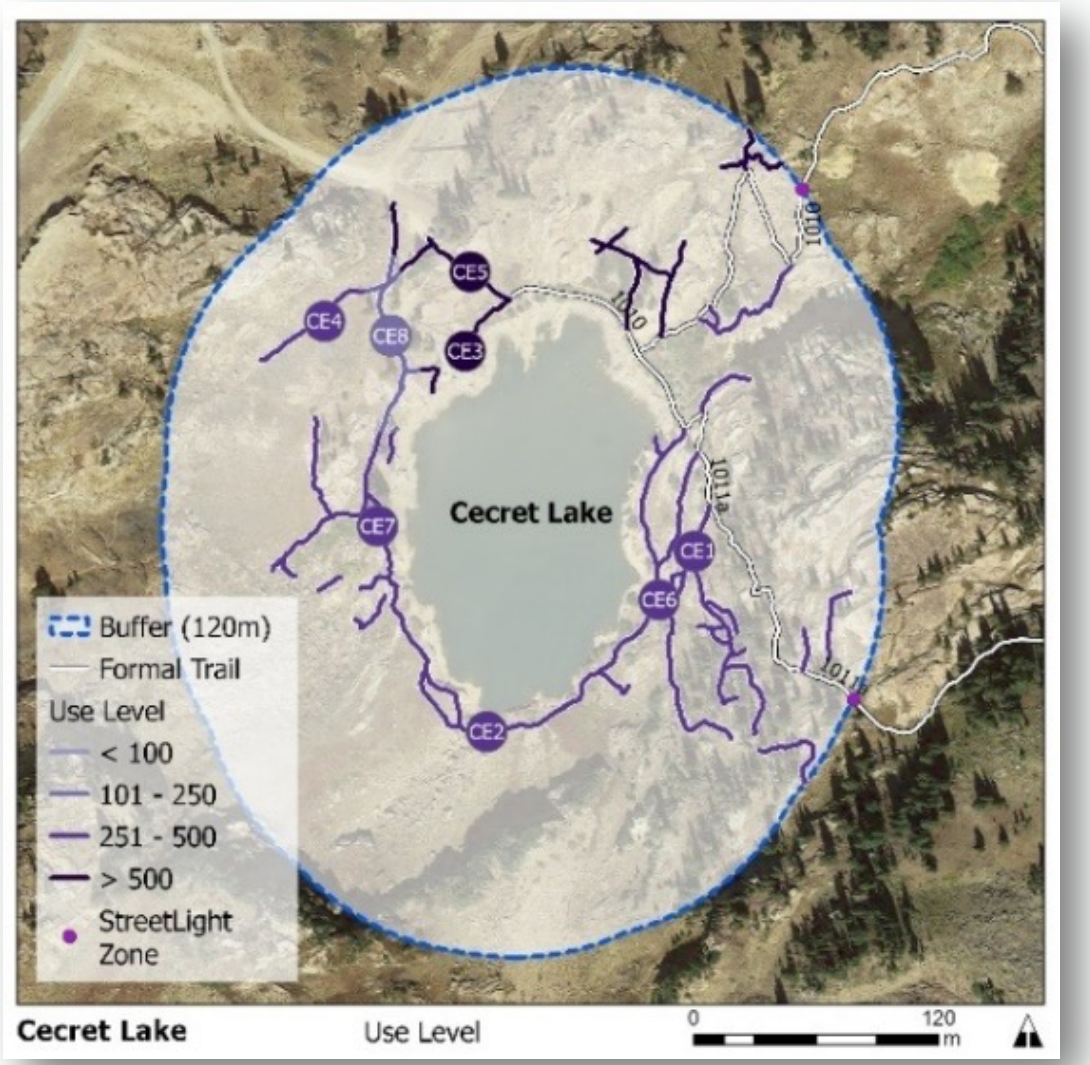

CECRET LAKE

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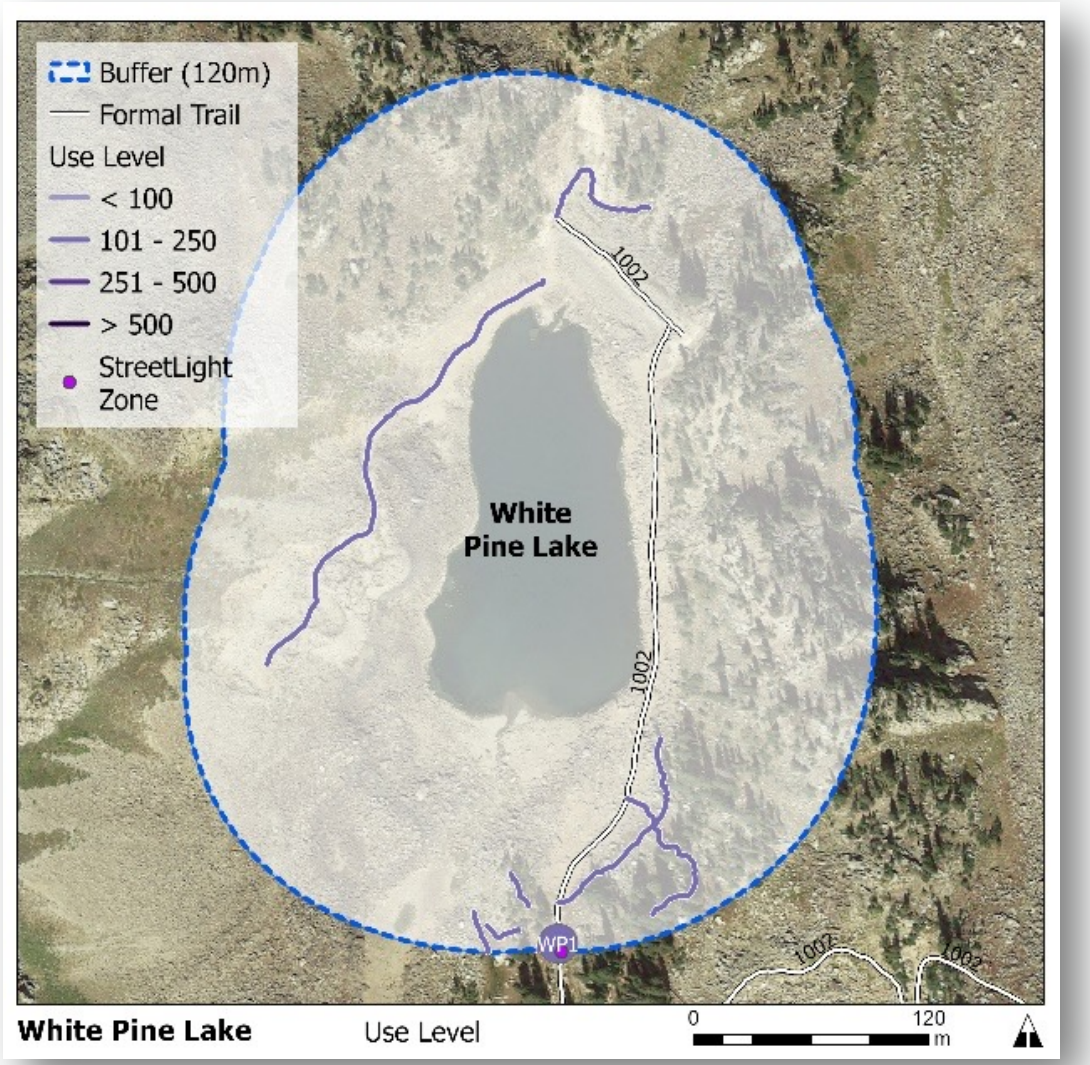

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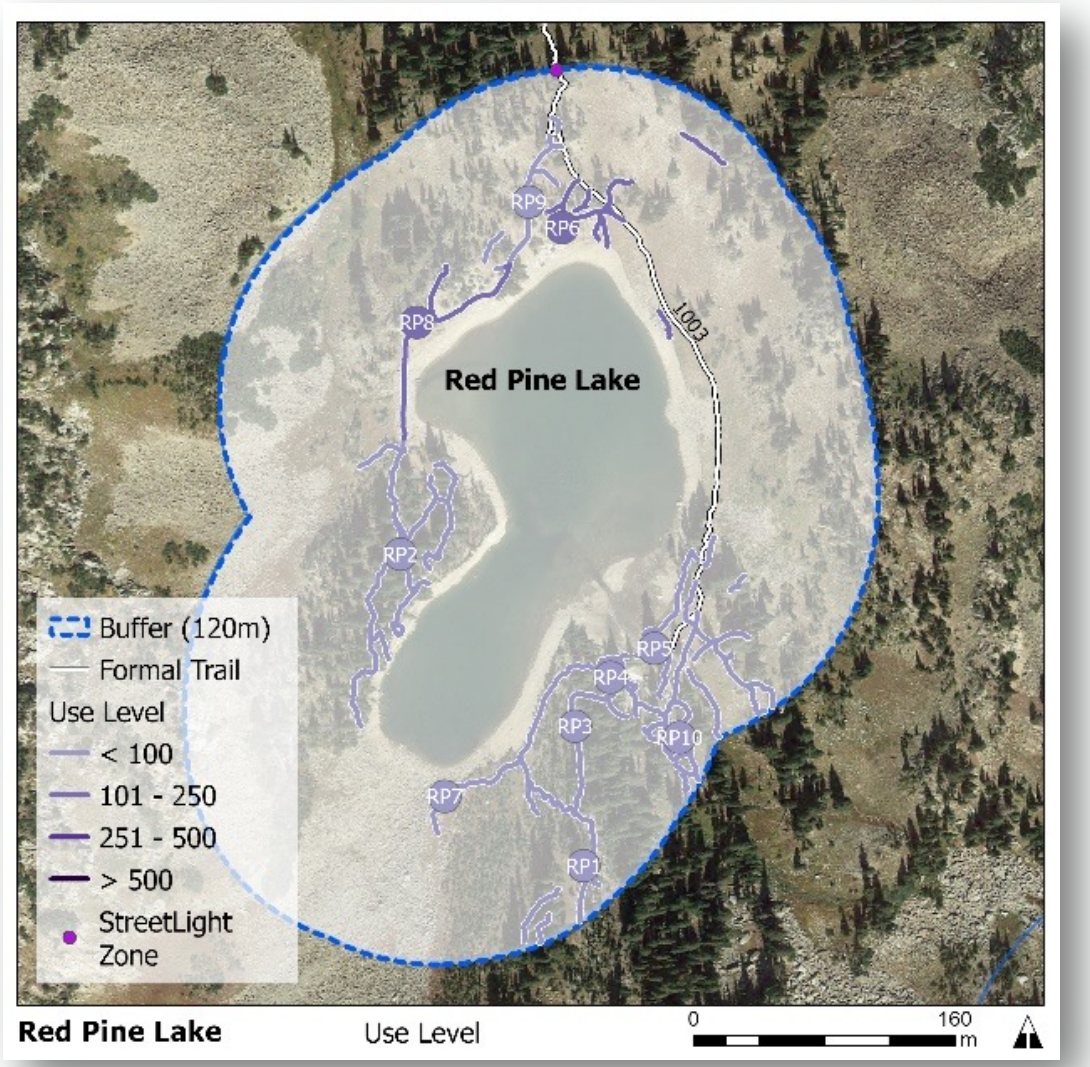

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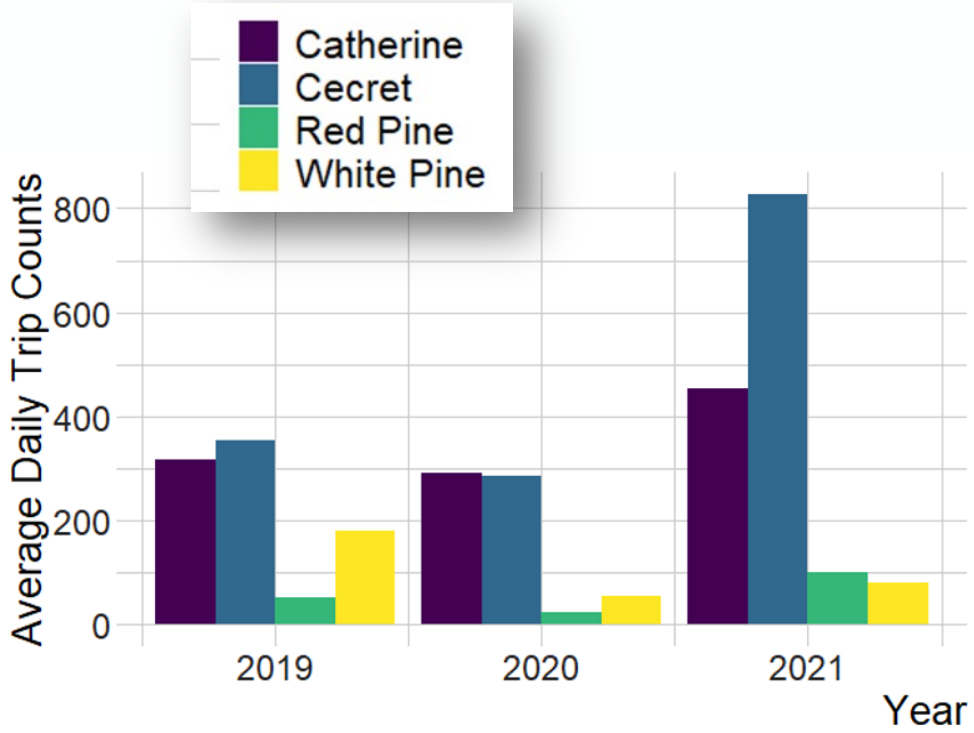
Average Daily Trips Counts on Informal Trails

Summer (May – October)



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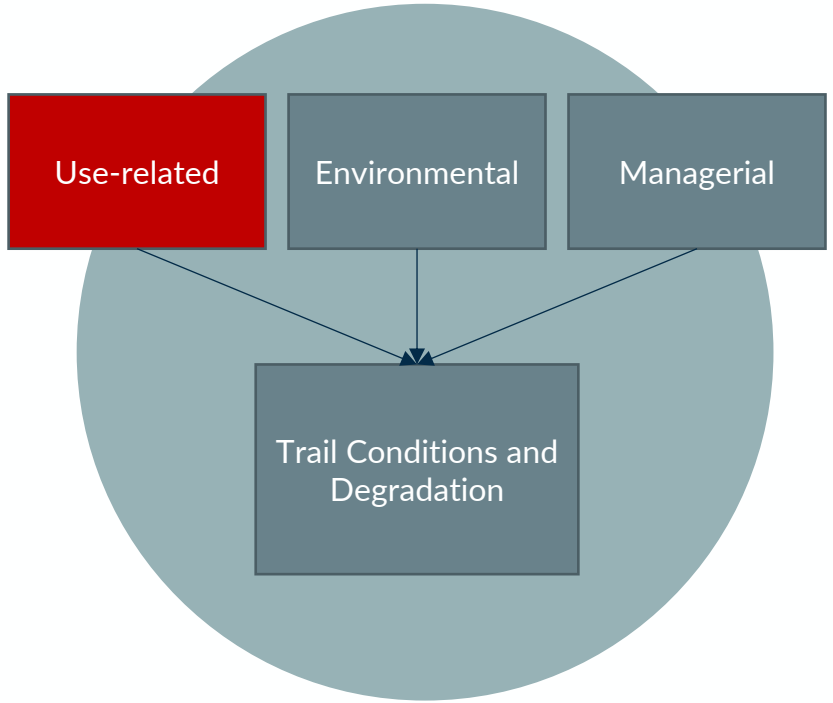

So how does use affect trail conditions?

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- Trail condition can be measured through qualitative indicators, such as **CONDITION CLASS**, or quantitative indicators such as **TRAIL WIDTH**.

Class	Description
1	Trail distinguishable; slight loss of vegetation cover and/or minimal disturbance of organic litter.
2	Trail obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.
3	Vegetation cover lost and/or organic litter pulverized within the center of the tread, some bare soil exposed.
4	Nearly complete or total loss of vegetation cover and organic litter within the tread, bare soil widespread.
5	Soil erosion severe, as indicated by exposed roots and rocks and/or gullying.
R	Trail is predominantly on rock surfaces, so the effects of trampling are difficult to see/assess.

Sources: (13) Monz et al. (2010), Marion (personal communication, September 2021)

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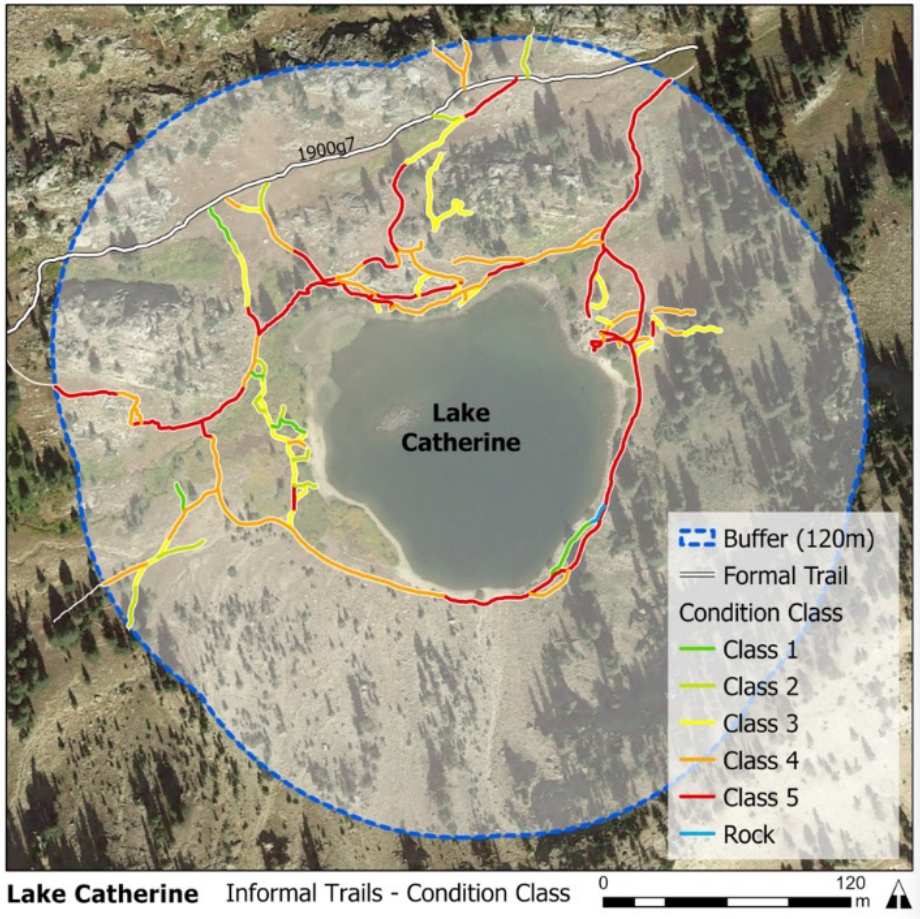
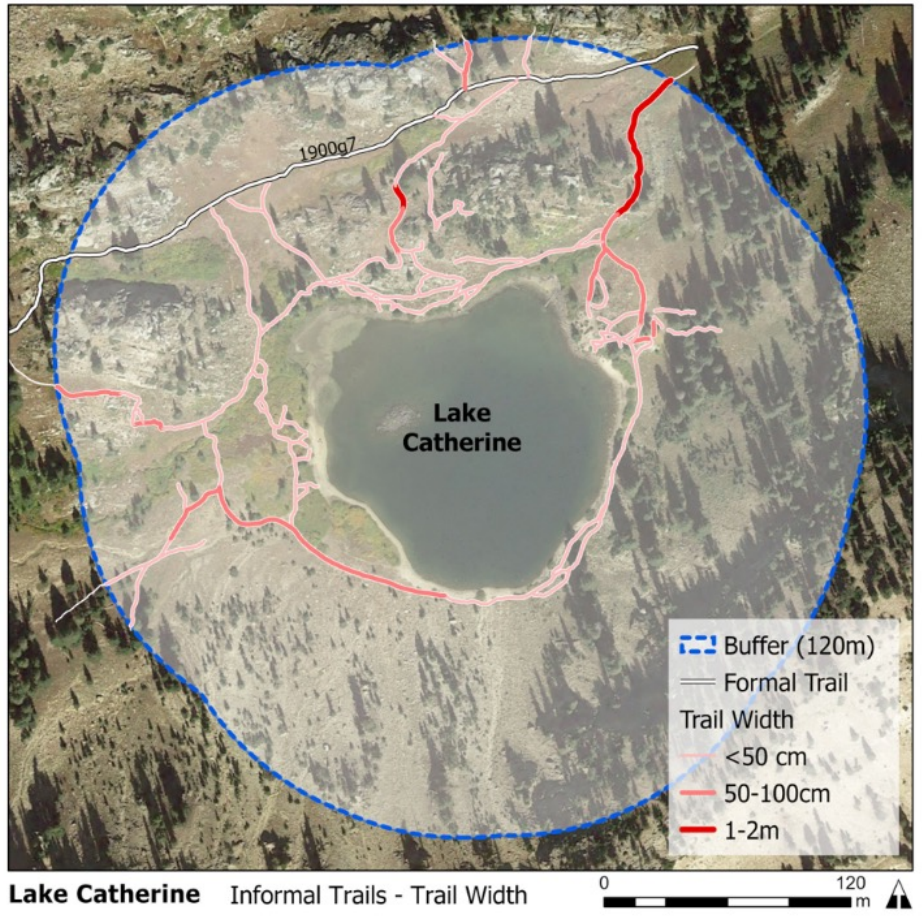
LAKE CATHERINE

- We assessed the condition class and trail width for all informal trails around the lakes in LCC in Fall 2021

CONDITION CLASS



TRAIL WIDTH



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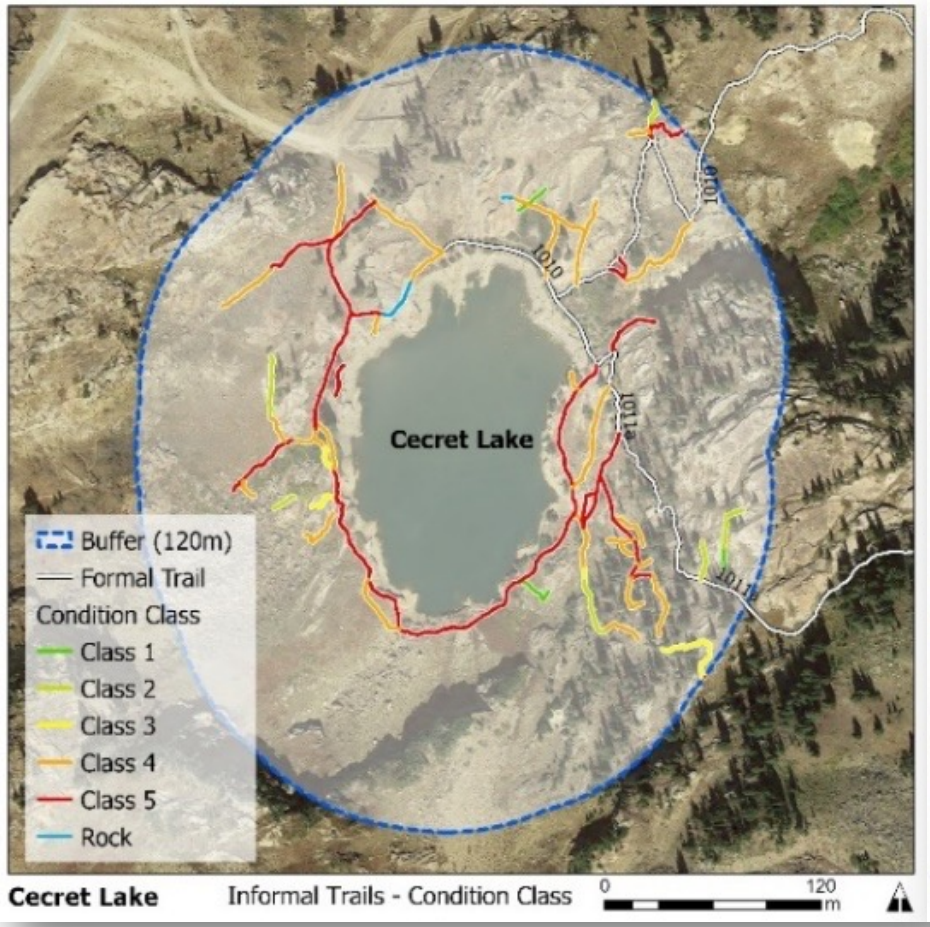
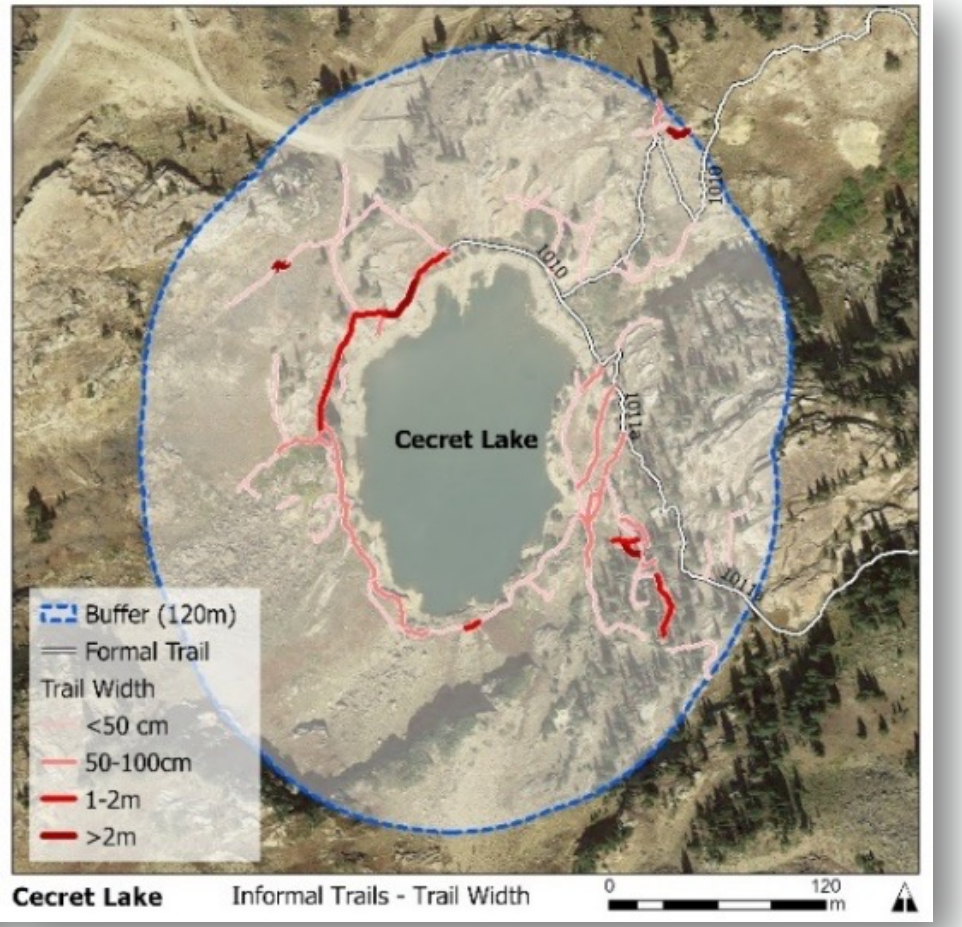
CECRET LAKE

- We assessed the condition class and trail width for all informal trails around the lakes in LCC in Fall 2021

CONDITION CLASS



TRAIL WIDTH



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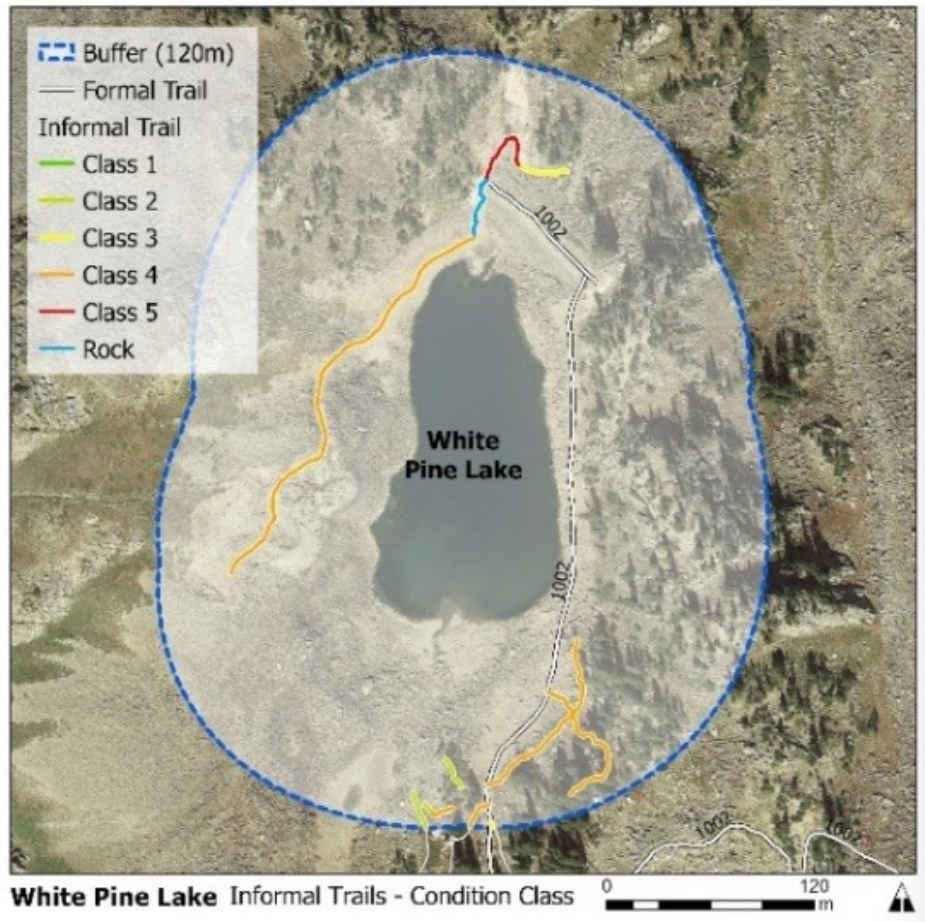
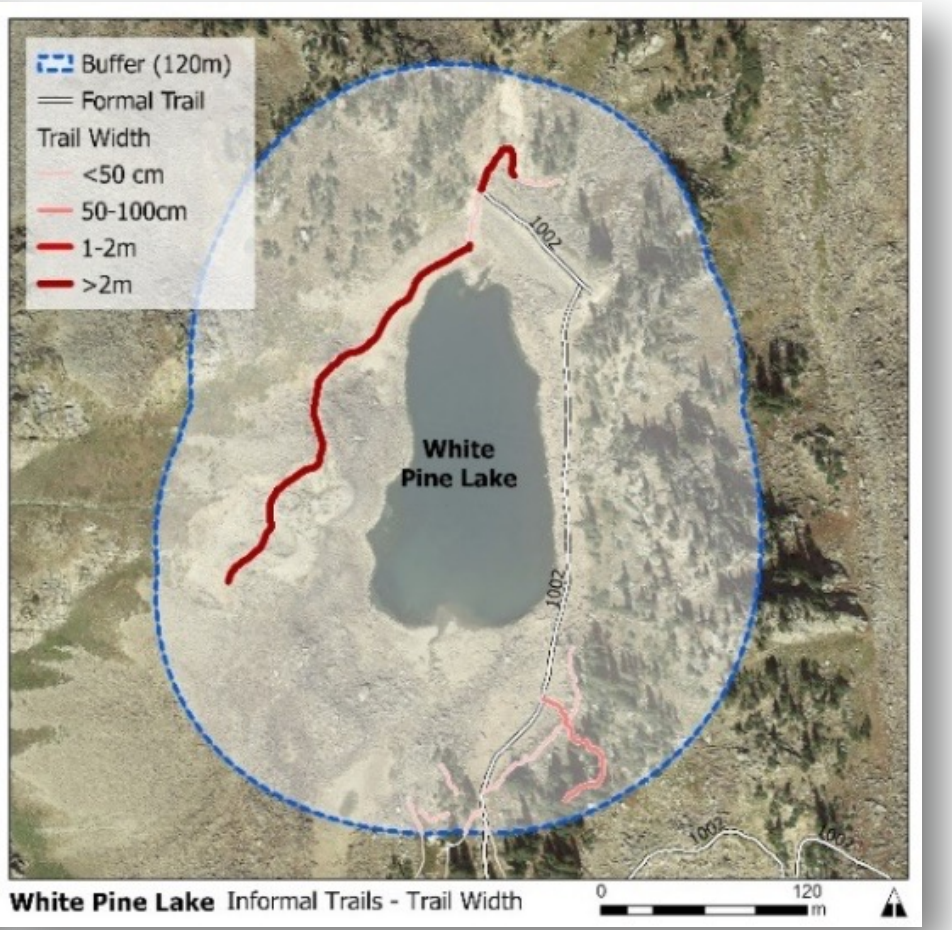
WHITE PINE LAKE

- We assessed the condition class and trail width for all informal trails around the lakes in LCC in Fall 2021

CONDITION CLASS



TRAIL WIDTH



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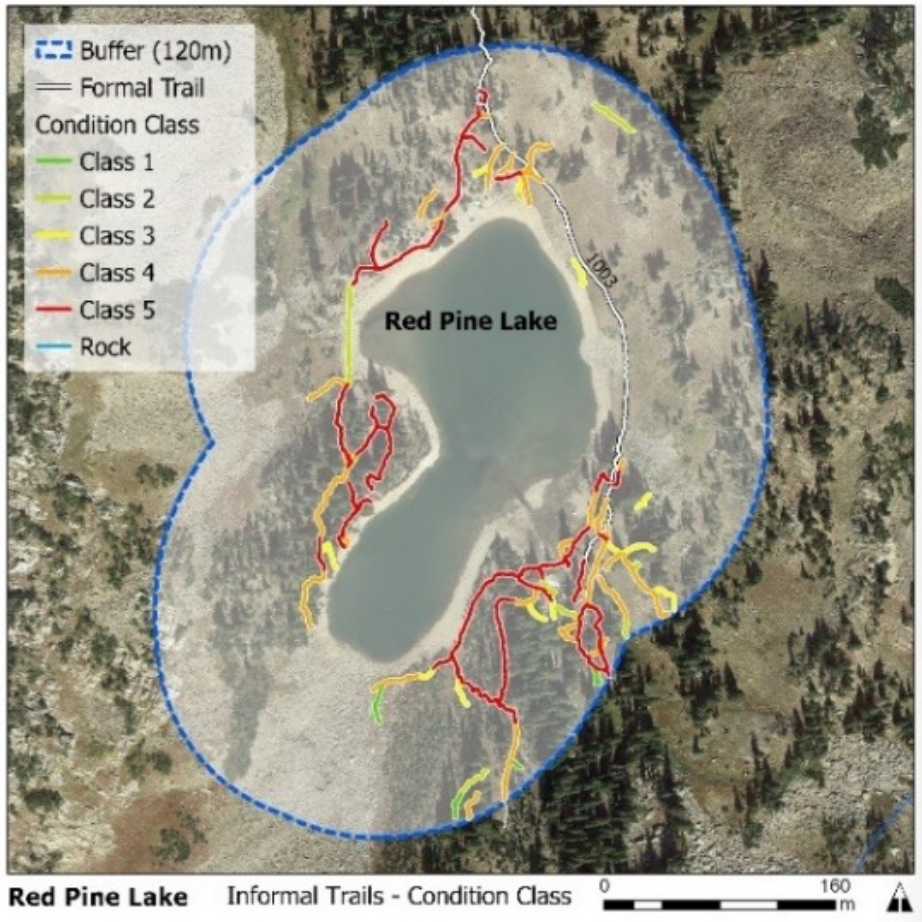
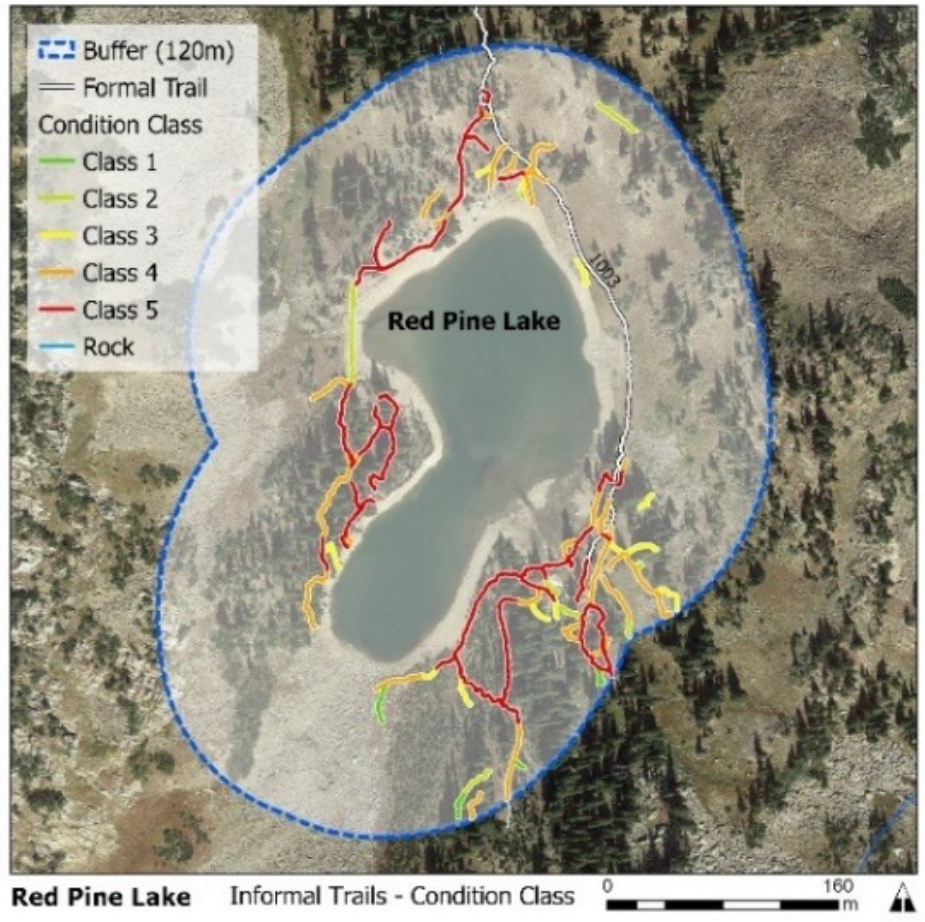
RED PINE LAKE

- We assessed the condition class and trail width for all informal trails around the lakes in LCC in Fall 2021

CONDITION CLASS



TRAIL WIDTH



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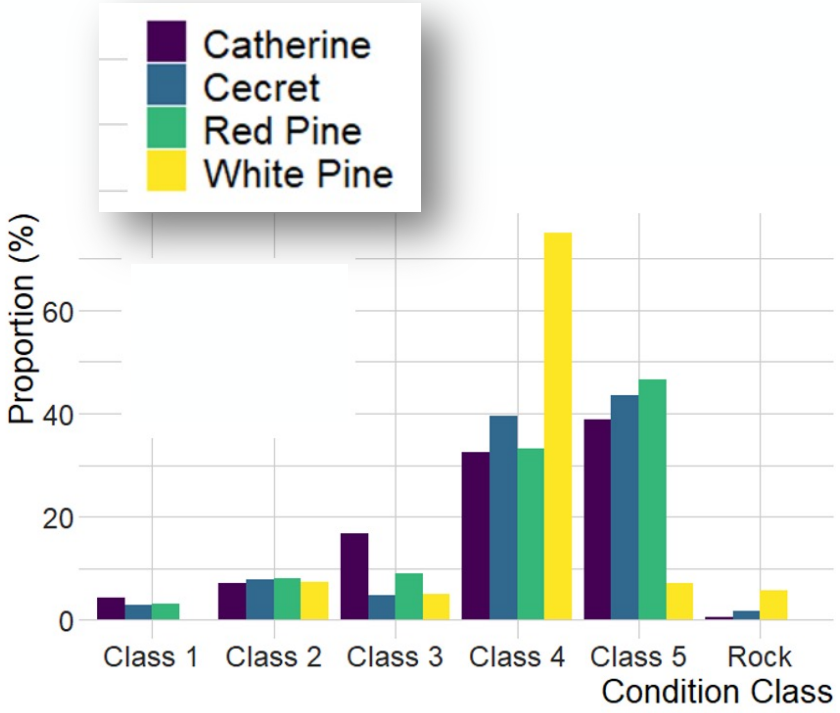
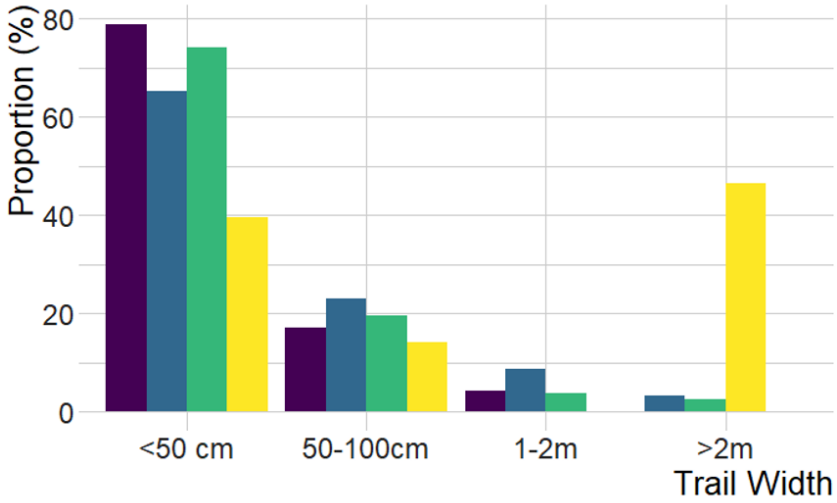
- We assessed the condition class and trail width for all informal trails around the lakes in LCC in Fall 2021





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- We assessed a variety of other environmental and managerial factors that might influence trails conditions around the lakes in LCC in Fall 2021

Response Variables

Condition Class *(Class 1-5)*

Trail Width Categories *(<50cm, 50-100cm, 1-2m, >2m)*

FACTORS INFLUENCING TRAIL CONDITIONS

Use Level (cont.)

Surrounding Vegetation (cat., *Forested, Open Grassland/Meadow, Other*)

Trail Grade (cont., %)

Trail Slope Alignment (cont., °)

Distance to Lakeshore (cont., m)

Distance to Formal Trail (cont., m)

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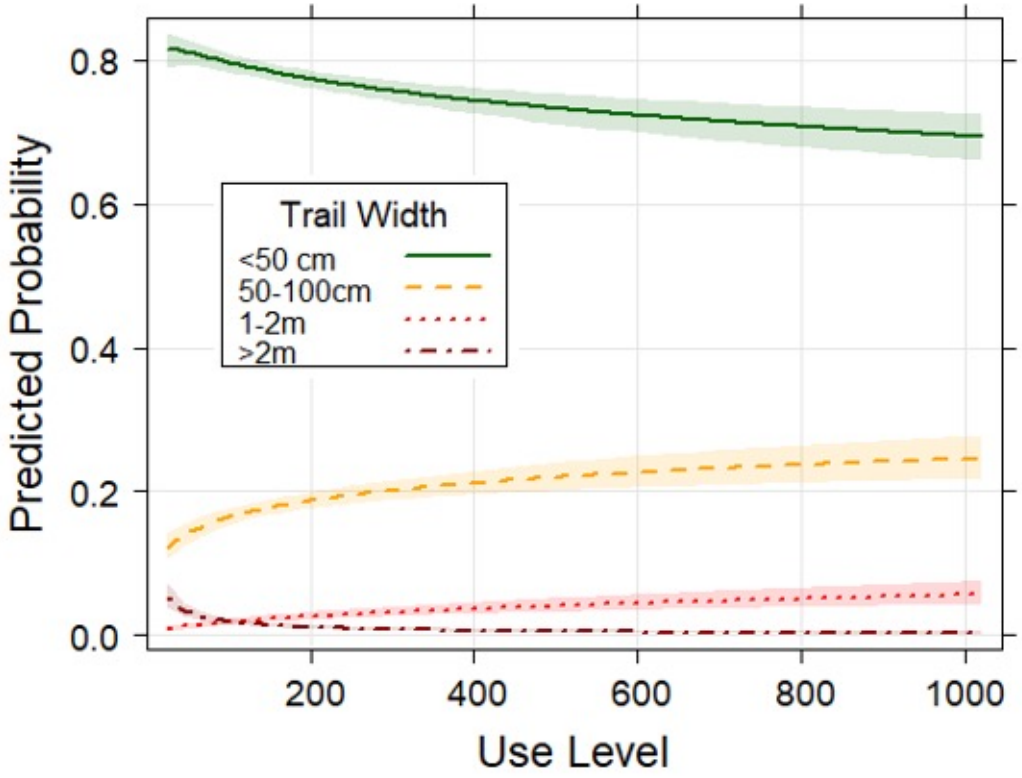
6. Questions

- Statistical analyses allows us to disentangle effects of different factors influencing trail conditions.
    - **Use level is more influential at lower use levels and trails are relatively less likely to be < 50 cm wide as use increases.**



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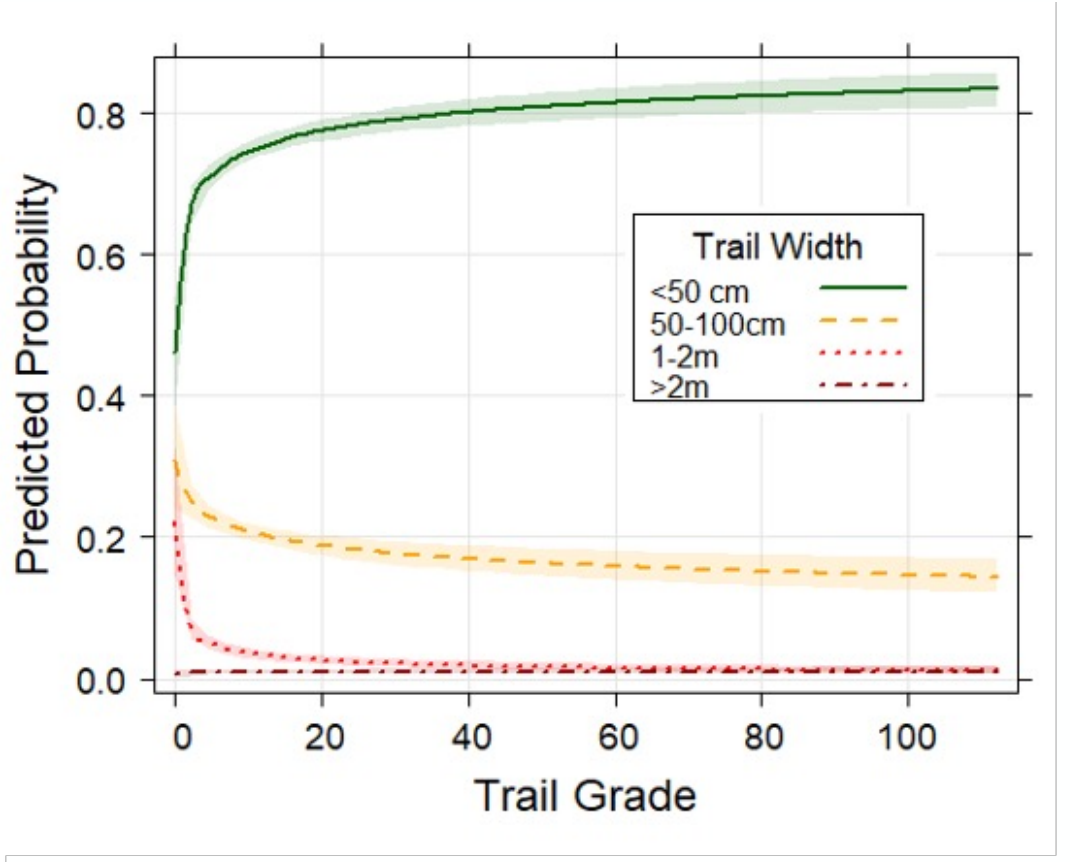
- Statistical analyses allows us to disentangle effects of different factors influencing trail conditions.
    - Use level is more influential at lower use levels and trails are relatively less likely to be < 50 cm wide as use increases.
    - **Lower trail grades have considerably more influence than other factors affecting trail conditions.**
    - **Trails are relatively more likely to be < 50 cm than 50 – 100 cm or 1 – 2 m as trail grade increases.**



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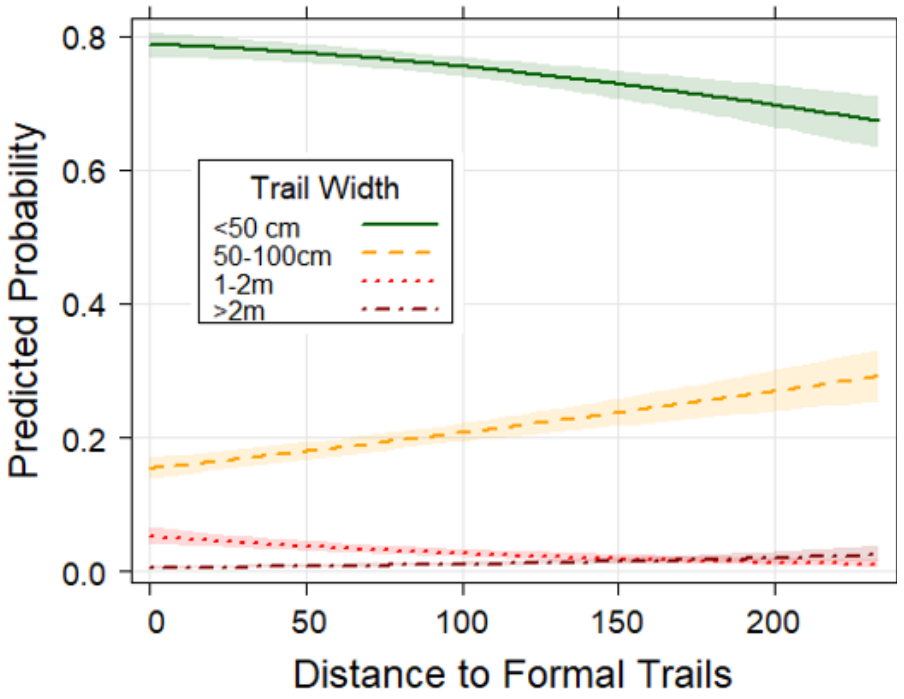
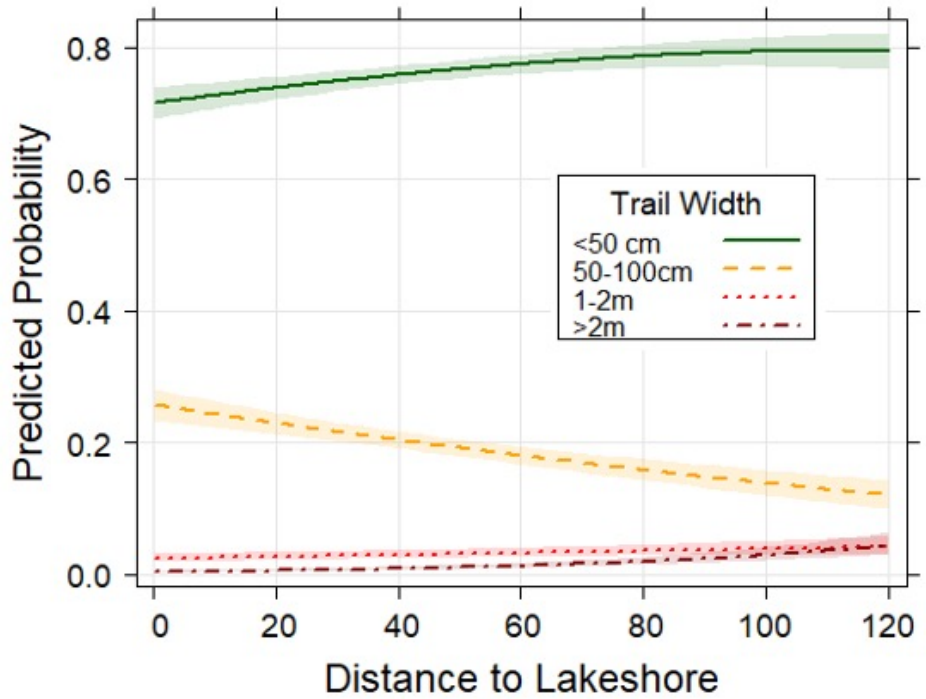
- Statistical analyses allows us to disentangle effects of different factors influencing trail conditions.
    - Use level is more influential at lower use levels and trails are relatively less likely to be < 50 cm wide as use increases.
    - Lower trail grades have considerably more influence than other factors affecting trail conditions.
    - Trails are relatively more likely to be < 50 cm than 50 – 100 cm or 1 – 2 m as trail grade increases.
    - **Trails closer to formal trails, and further from lakeshores, are relatively more likely to be < 50 cm wide than 50 – 100 cm.**





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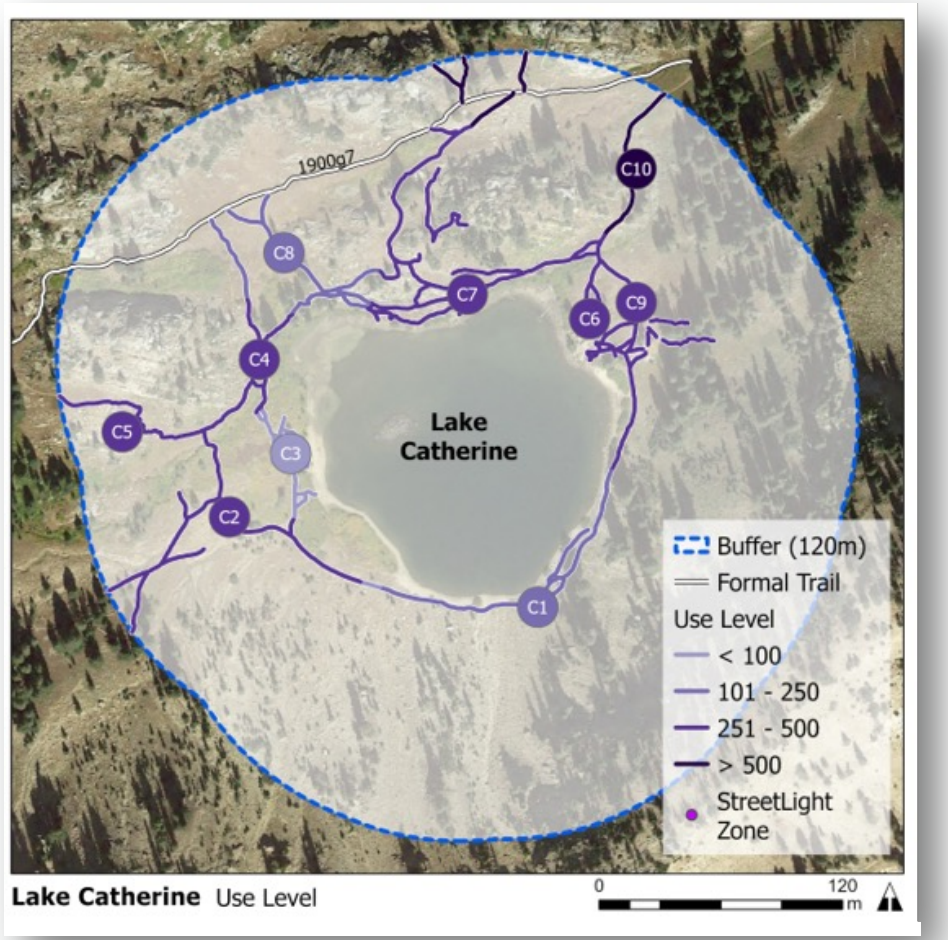
What does this mean for recreation management around these lakes?

Use and Impact: Trails that are not yet heavily impacted, receive low use levels, and don't fulfil critical functions for visitors should be closed and restored and use should be concentrated on trails that are already well established, receive high levels of use, and appear necessary for visitors.



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What does this mean for recreation management around these lakes?

Surface and Location: Visitors should be concentrated on durable, but walkable, surfaces when available and trails close to waterbodies should be hardened where possible.

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What does this mean for recreation management around these lakes?

TSA and trail grade: Use should be concentrated on trail sections with sustainable trail grades (2 – 10 %).

Credit: Bettina Spernbauer

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QUESTIONS

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