Yosemite National Park
Resources Management and Science

Pack Stock Framework & Science-Based Monitoring of Pack Stock Use in Yosemite Wilderness

(Kuhn et al. in review)

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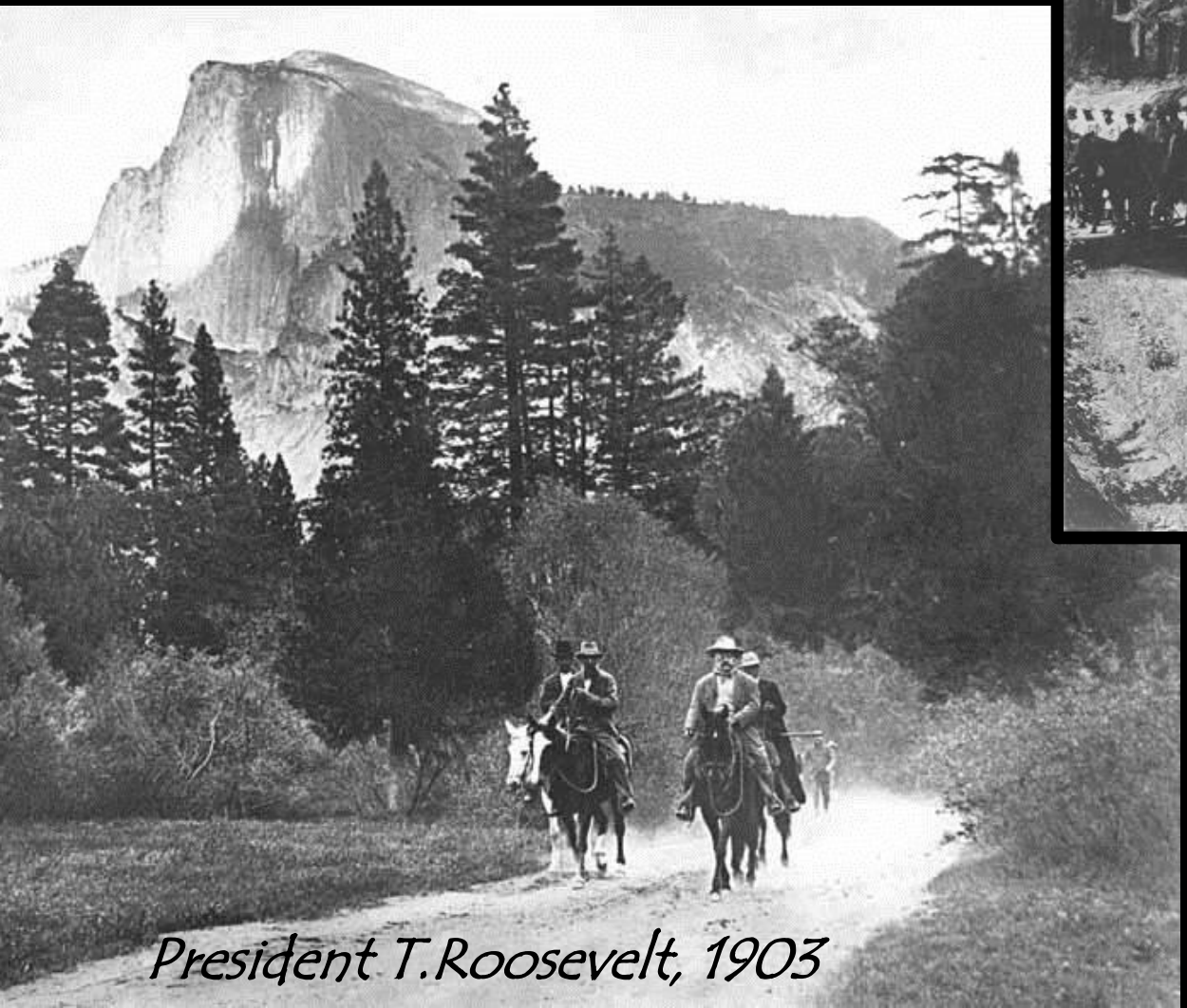
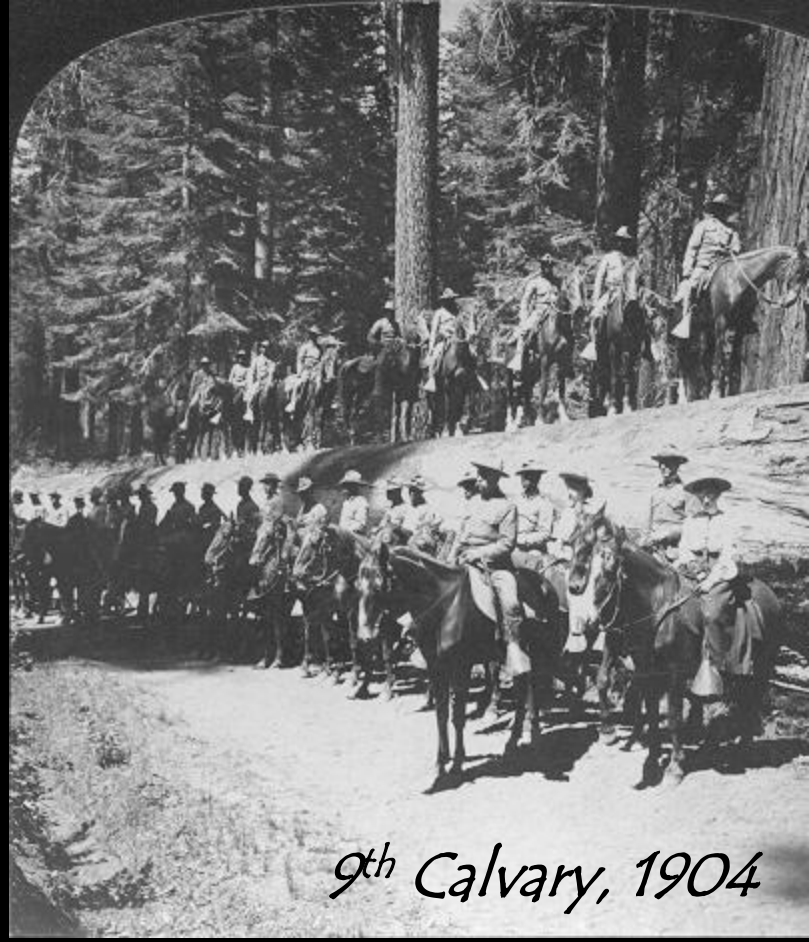
EXPERIENCE YOUR AMERICA

Pack Stock are an iconic image of the West, and played a key role in Yosemite's history.



President T.Roosevelt, 1903

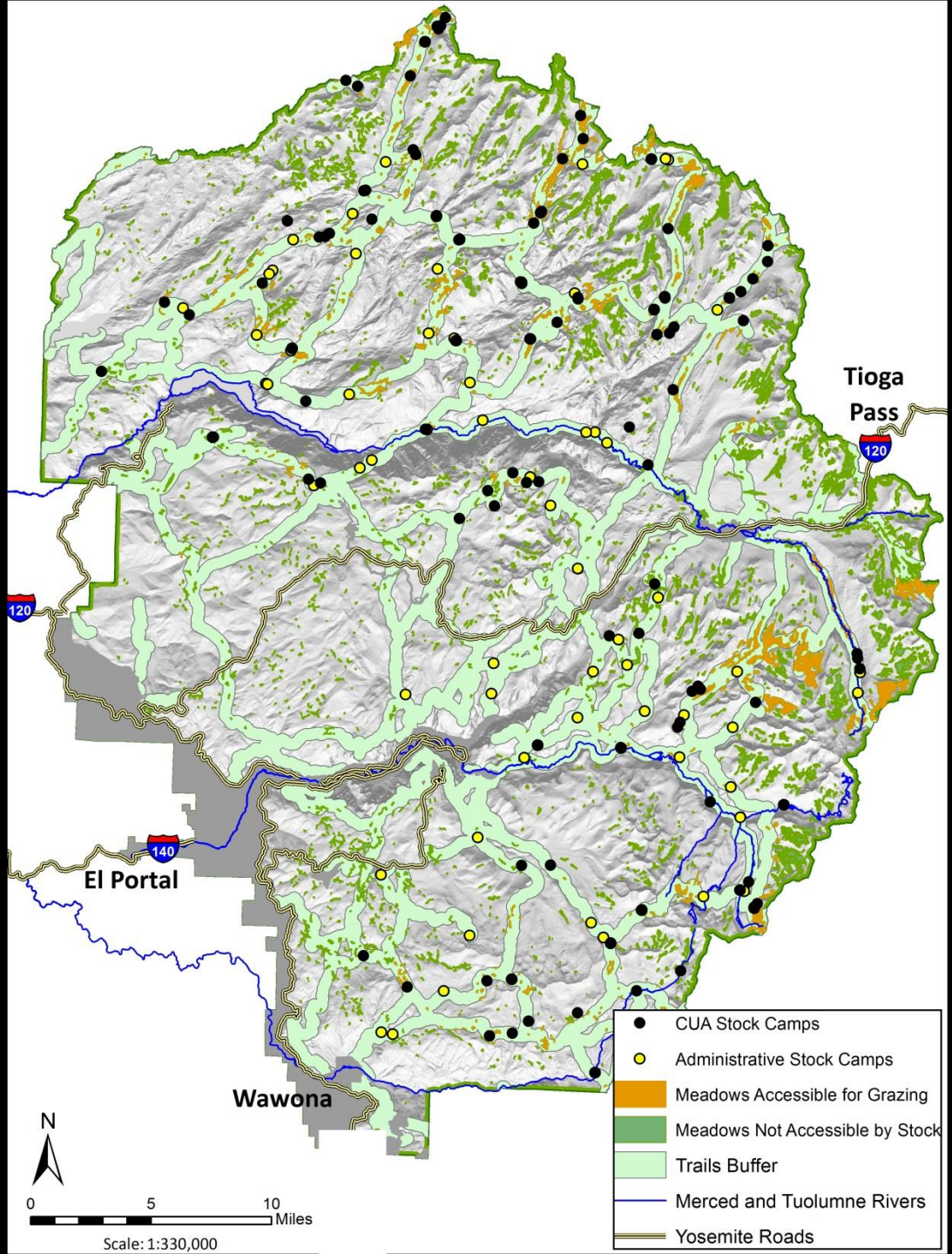


9th Calvary, 1904

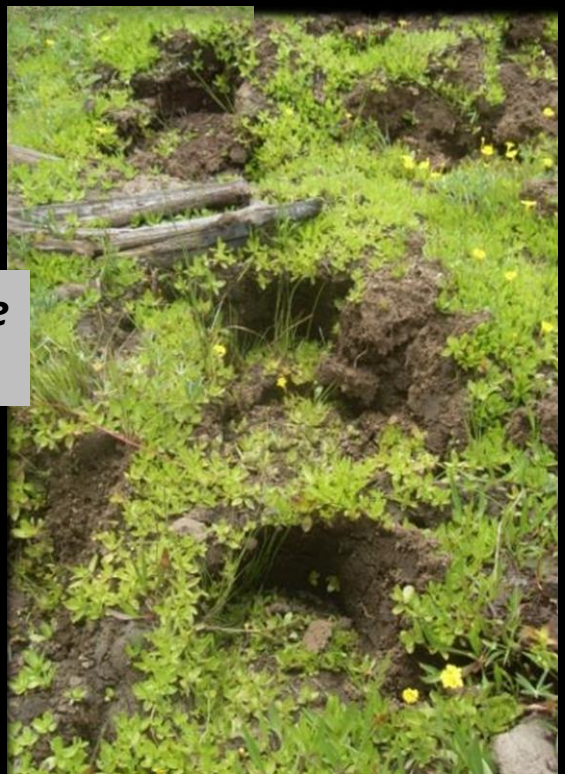
Goal:

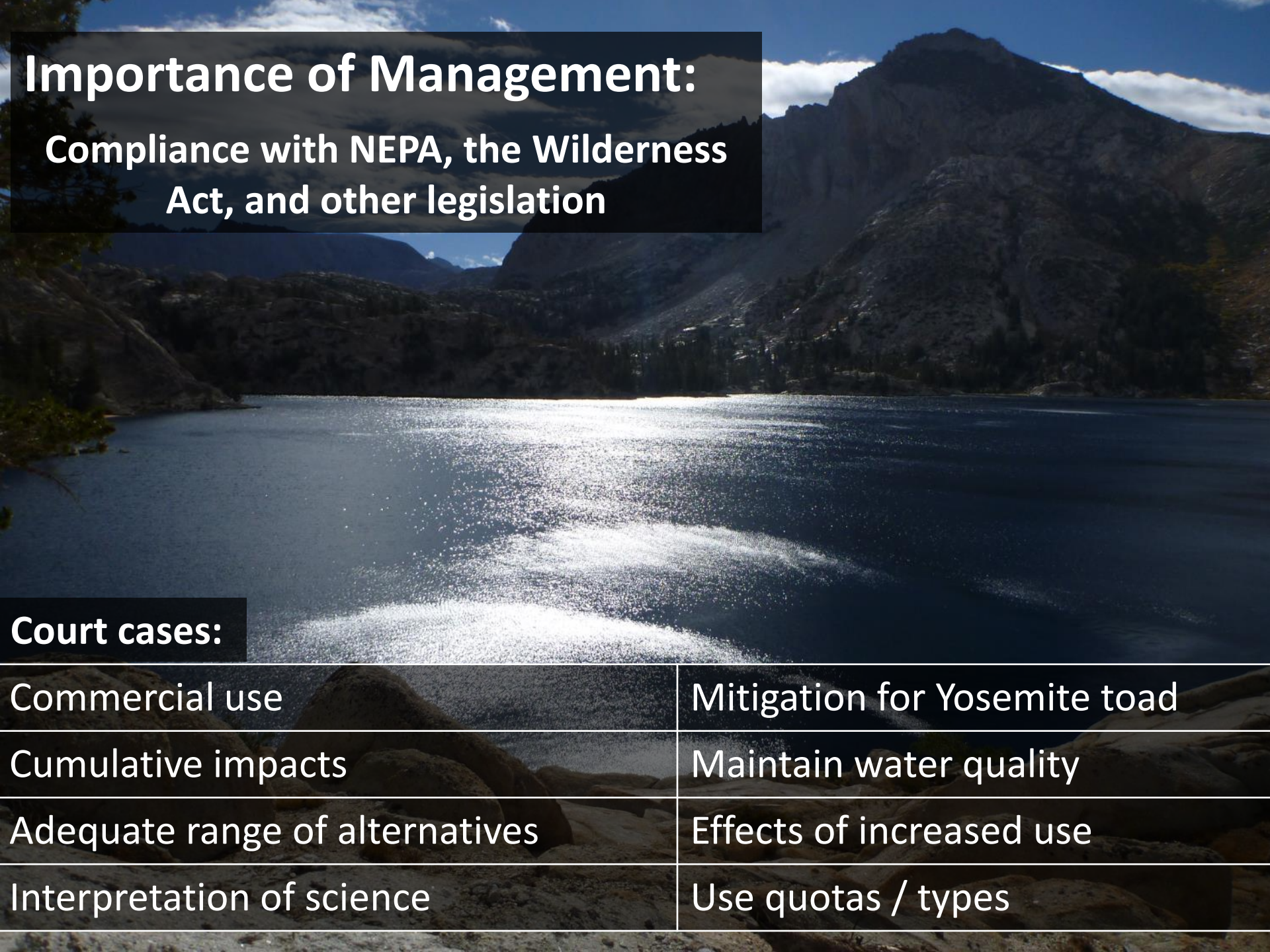
--Provide tools to inform Wilderness Stewardship Plan and the preservation of wilderness character, natural & cultural resources.

--Targeted and efficient approach to monitor effects of use.


Tioga
Pass
120
120
140
El Portal
Wawona
N
0
5
10
Miles
Scale: 1:330,000
CUA Stock Camps
Administrative Stock Camps
Meadows Accessible for Grazing
Meadows Not Accessible by Stock
Trails Buffer
Merced and Tuolumne Rivers
Yosemite Roads

Importance of Monitoring





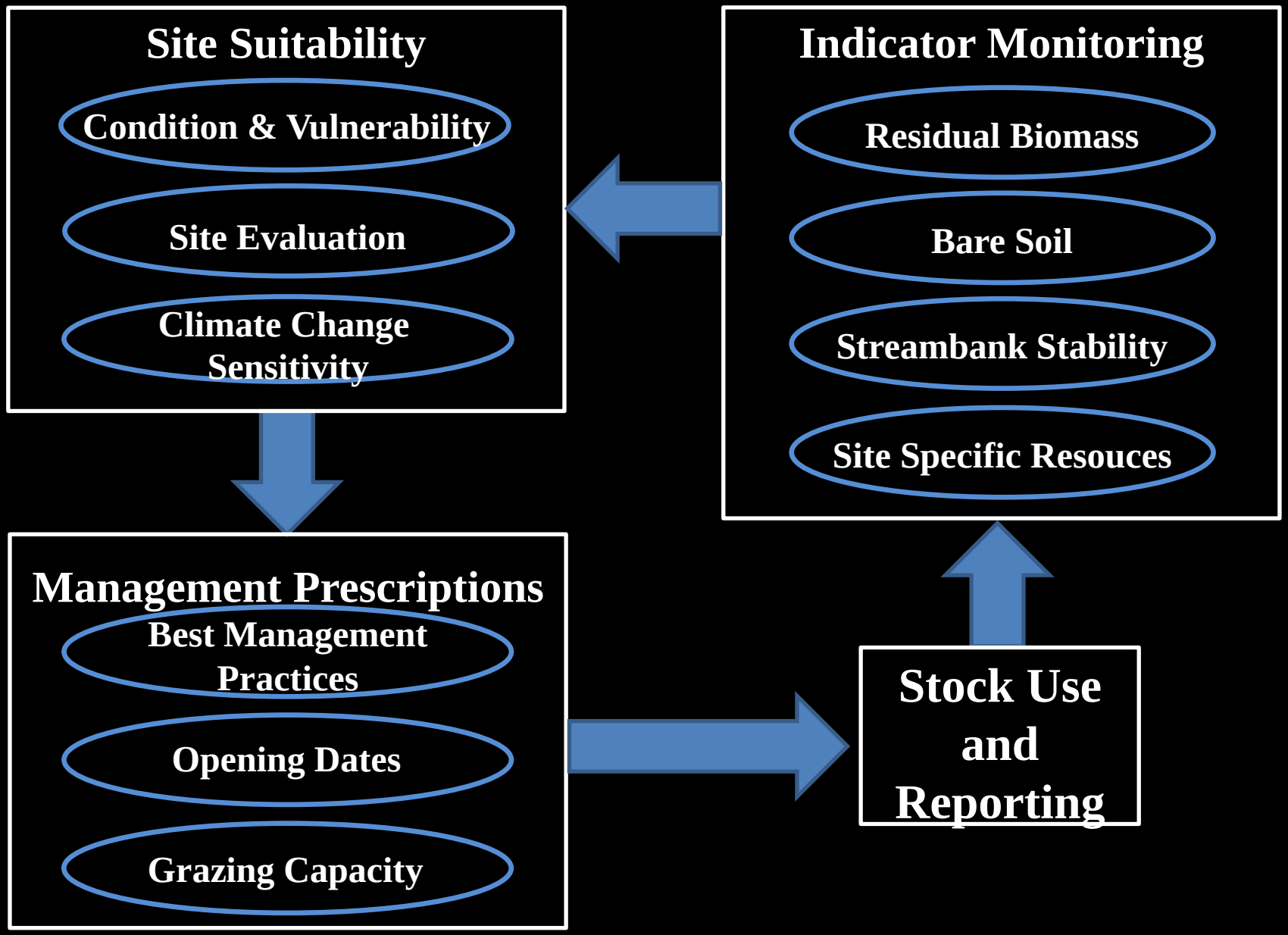
Importance of Management:

Compliance with NEPA, the Wilderness Act, and other legislation

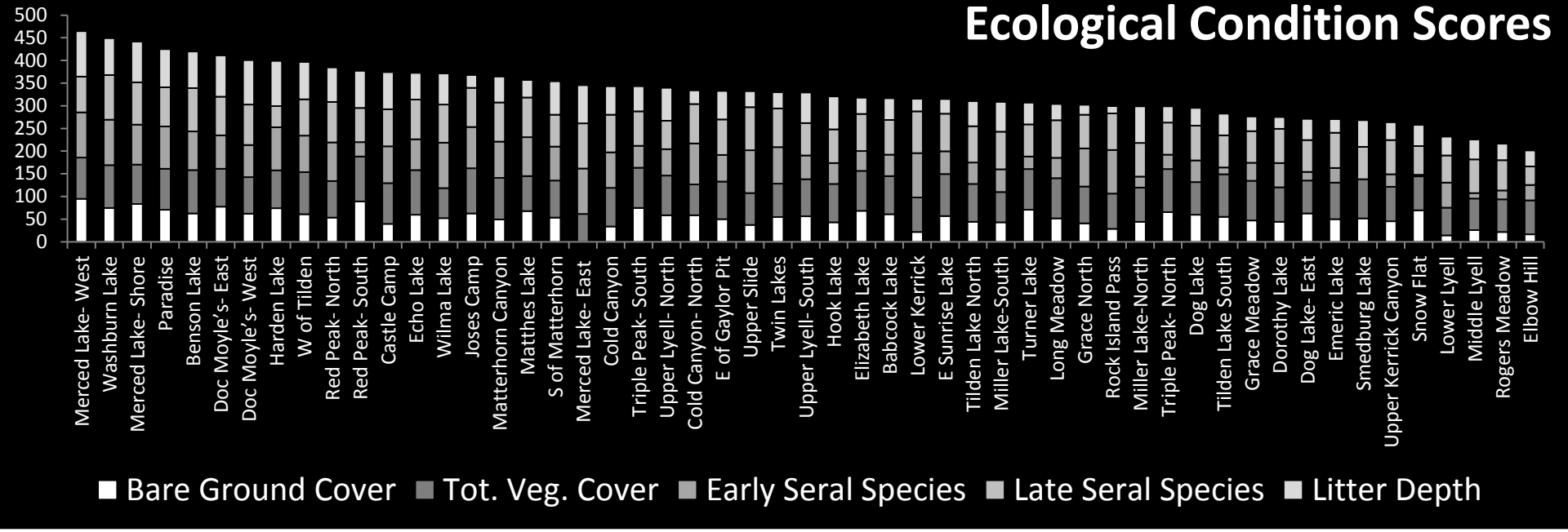
Court cases:

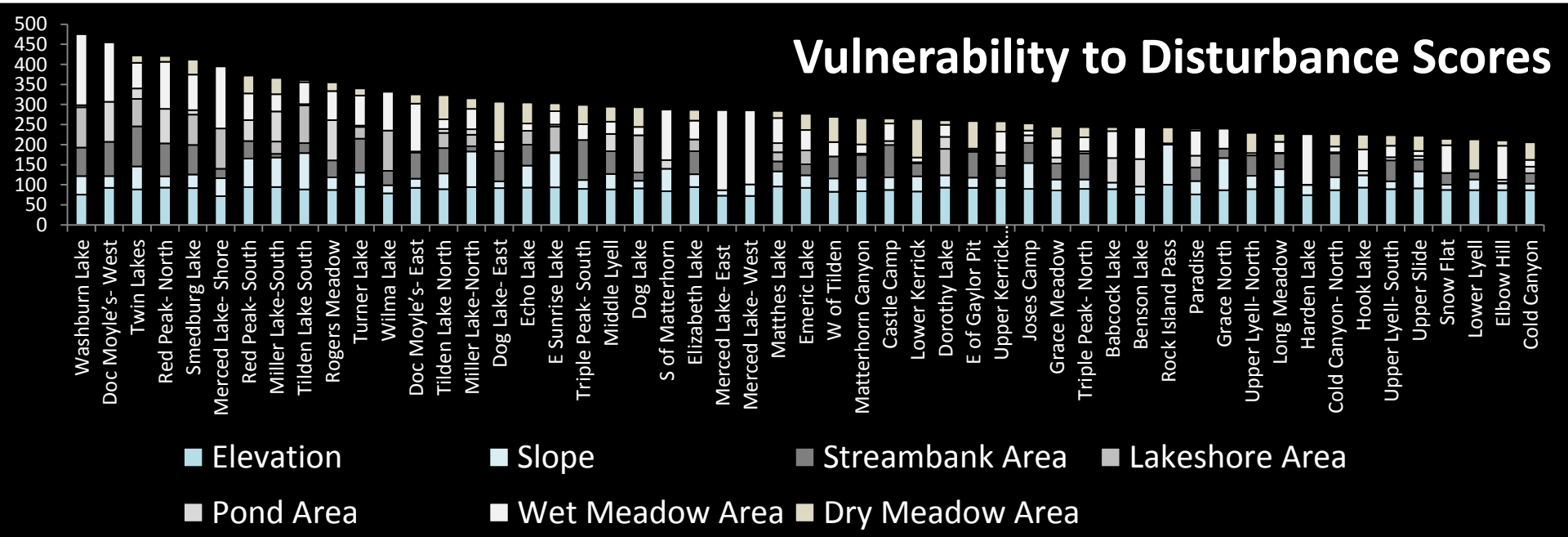
Commercial use	Mitigation for Yosemite toad
Cumulative impacts	Maintain water quality
Adequate range of alternatives	Effects of increased use
Interpretation of science	Use quotas / types

Adaptive Pack Stock Framework



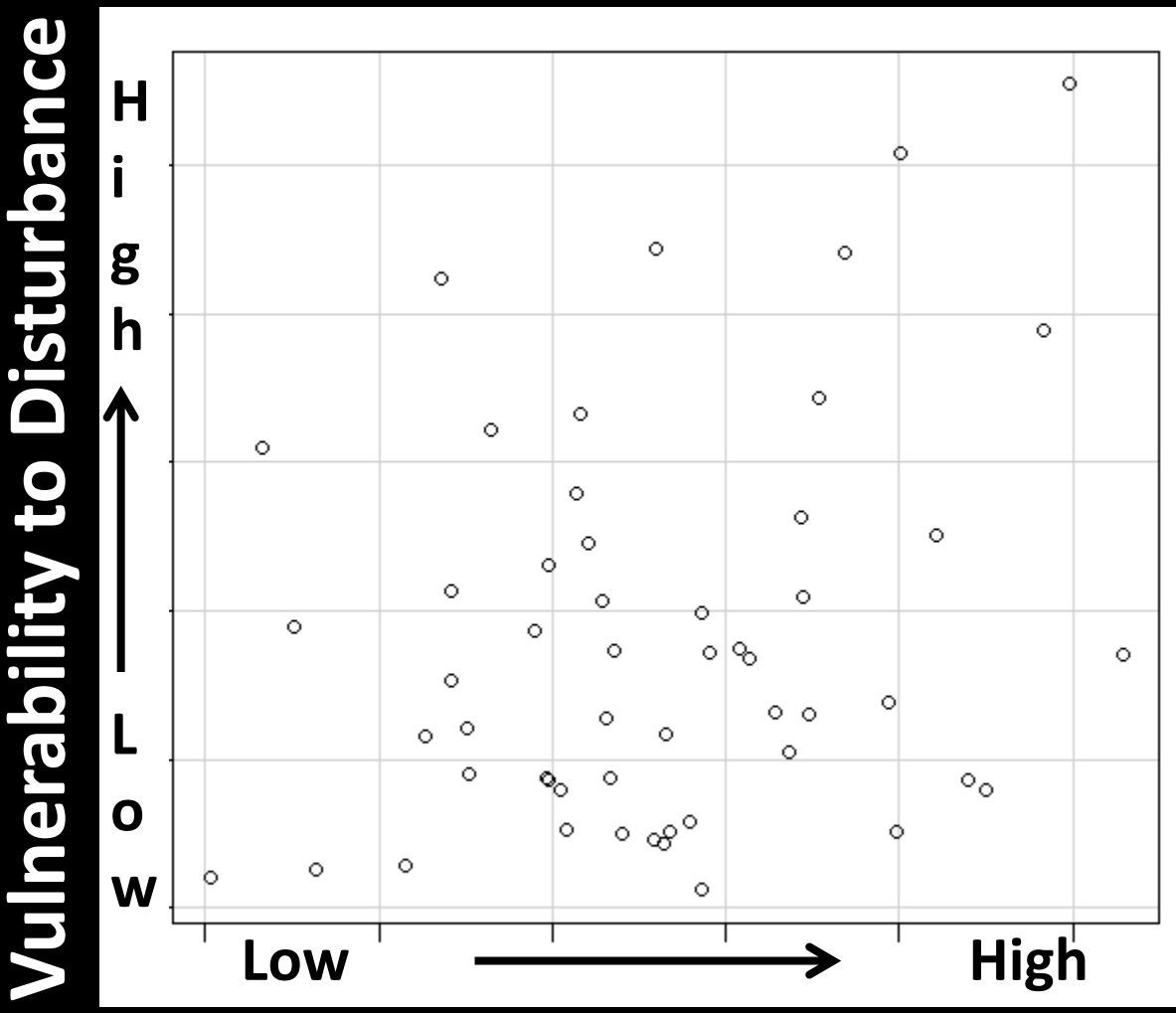
Site Suitability





Site Suitability

- Condition & Vulnerability
- Site Evaluation
- Climate Change Sensitivity



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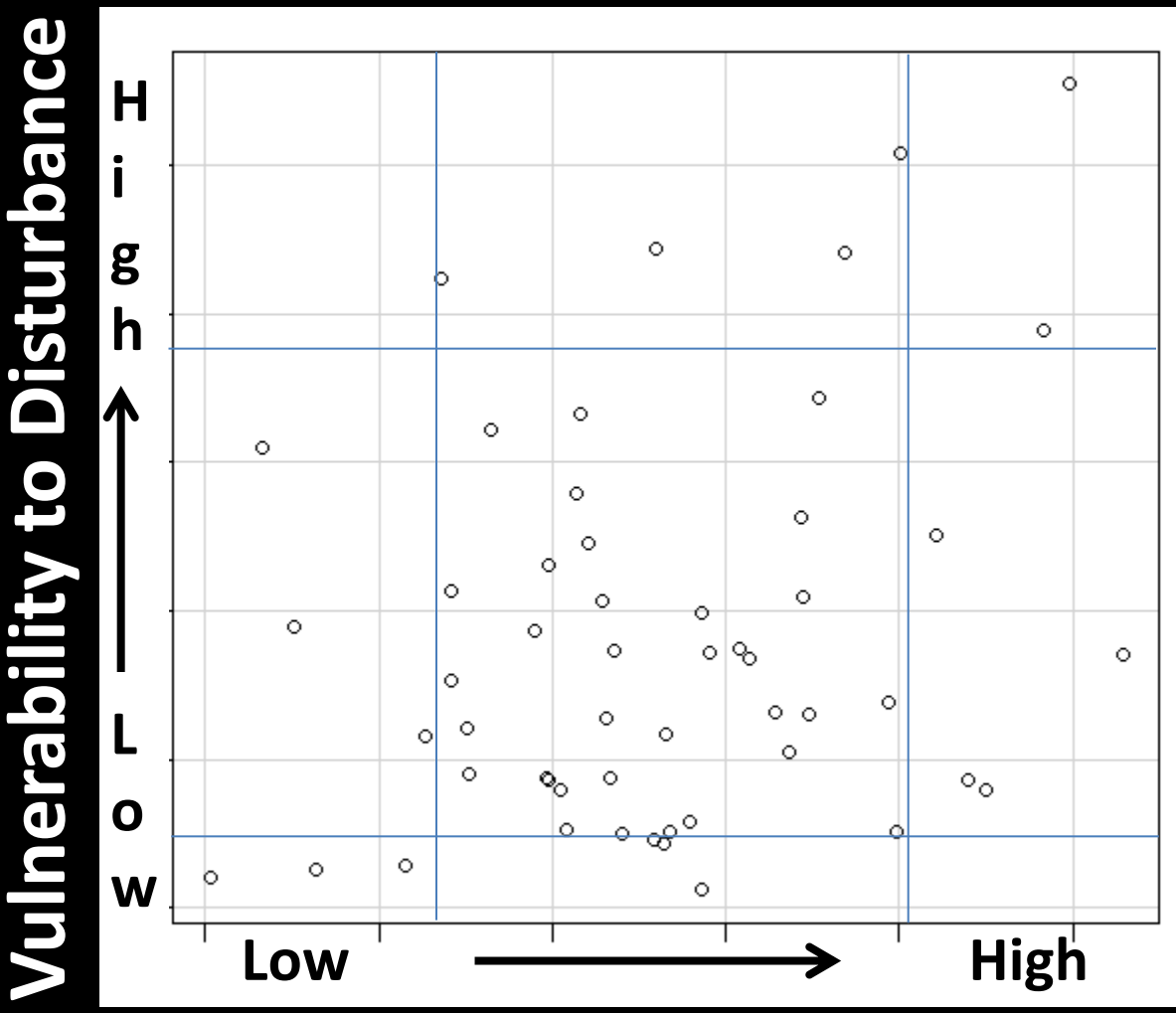


(Kuhn et al. 2015)

Site Suitability

Condition & Vulnerability

Site Evaluation

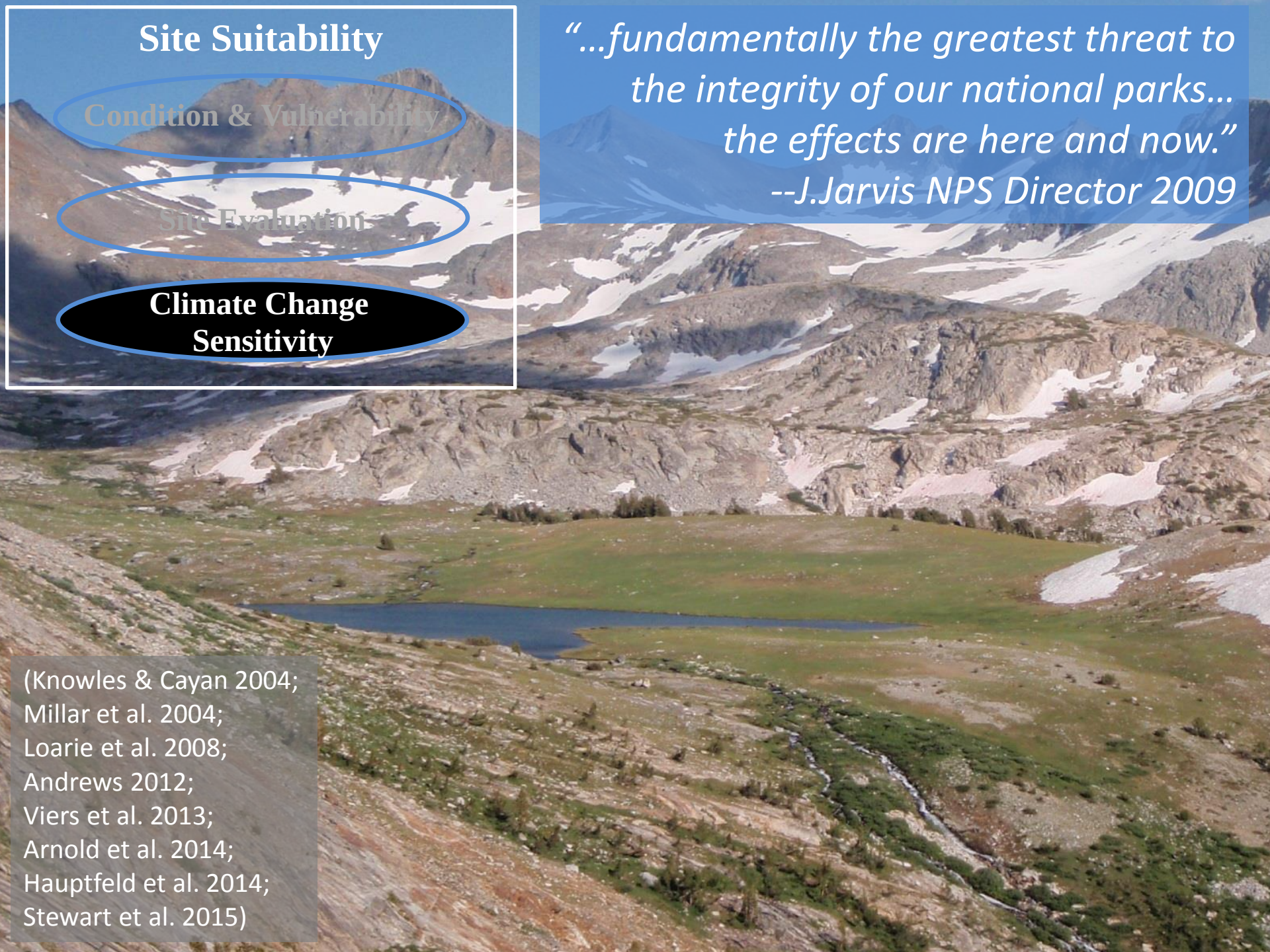
Climate Change Sensitivity

Access Route

Camp Site

Holding Area

Grazing Area



"…fundamentally the greatest threat to the integrity of our national parks… the effects are here and now."
--J.Jarvis NPS Director 2009

(Knowles & Cayan 2004; Millar et al. 2004; Loarie et al. 2008; Andrews 2012; Viers et al. 2013; Arnold et al. 2014; Hauptfeld et al. 2014; Stewart et al. 2015)

Management Prescriptions

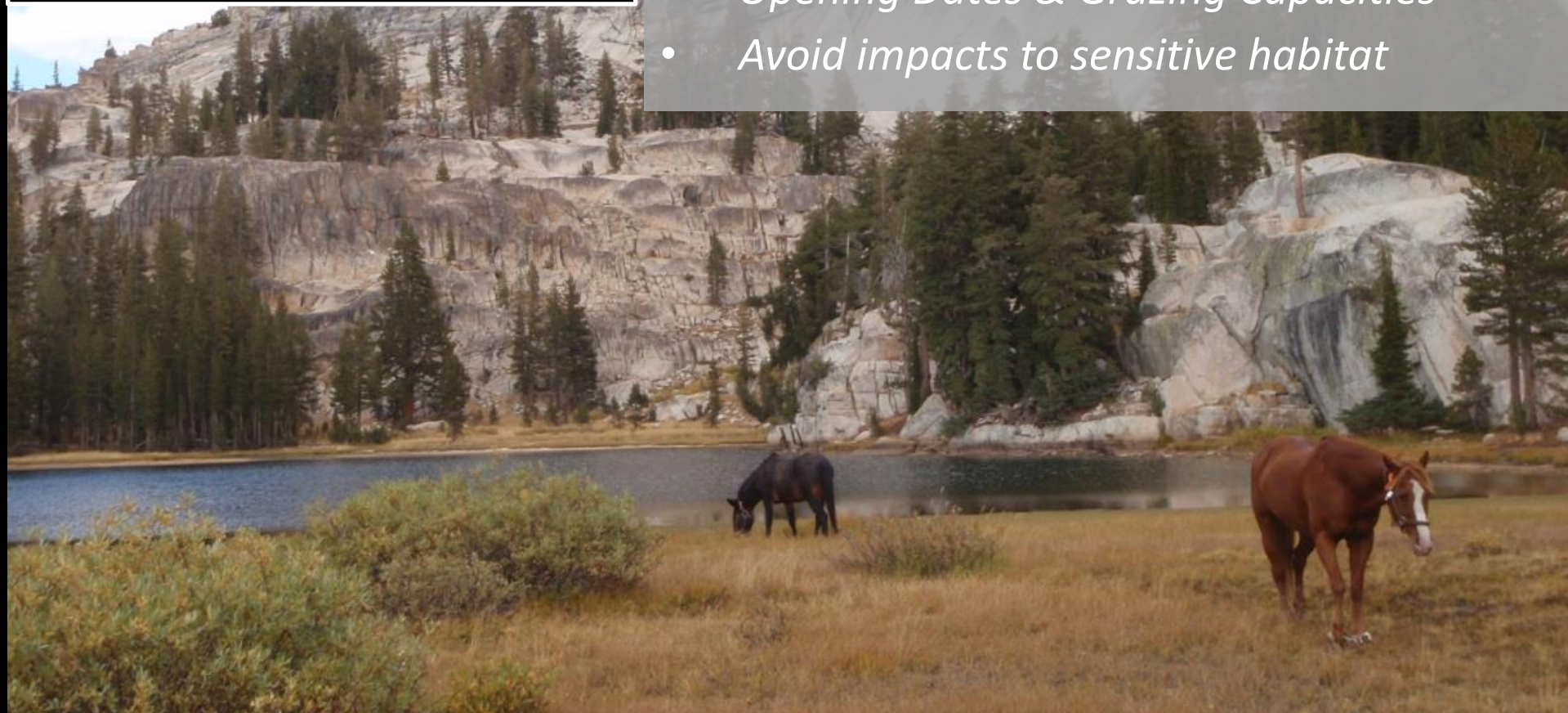
- Best Management Practices
- Opening Dates
- Grazing Capacity

Park-Wide

- *Promote stewardship and Leave No Trace*
- *No grazing within 4 miles of trailheads*
- *Travel up to ¼ mile off-trail for water, rest-stops, or camping*

Site-specific

- *Opening Dates & Grazing Capacities*
- *Avoid impacts to sensitive habitat*



Stock handling practices

Management Prescriptions

- **Best Management Practices**
- **Opening Dates**
- **Grazing Capacity**

Portable Elec. Fence

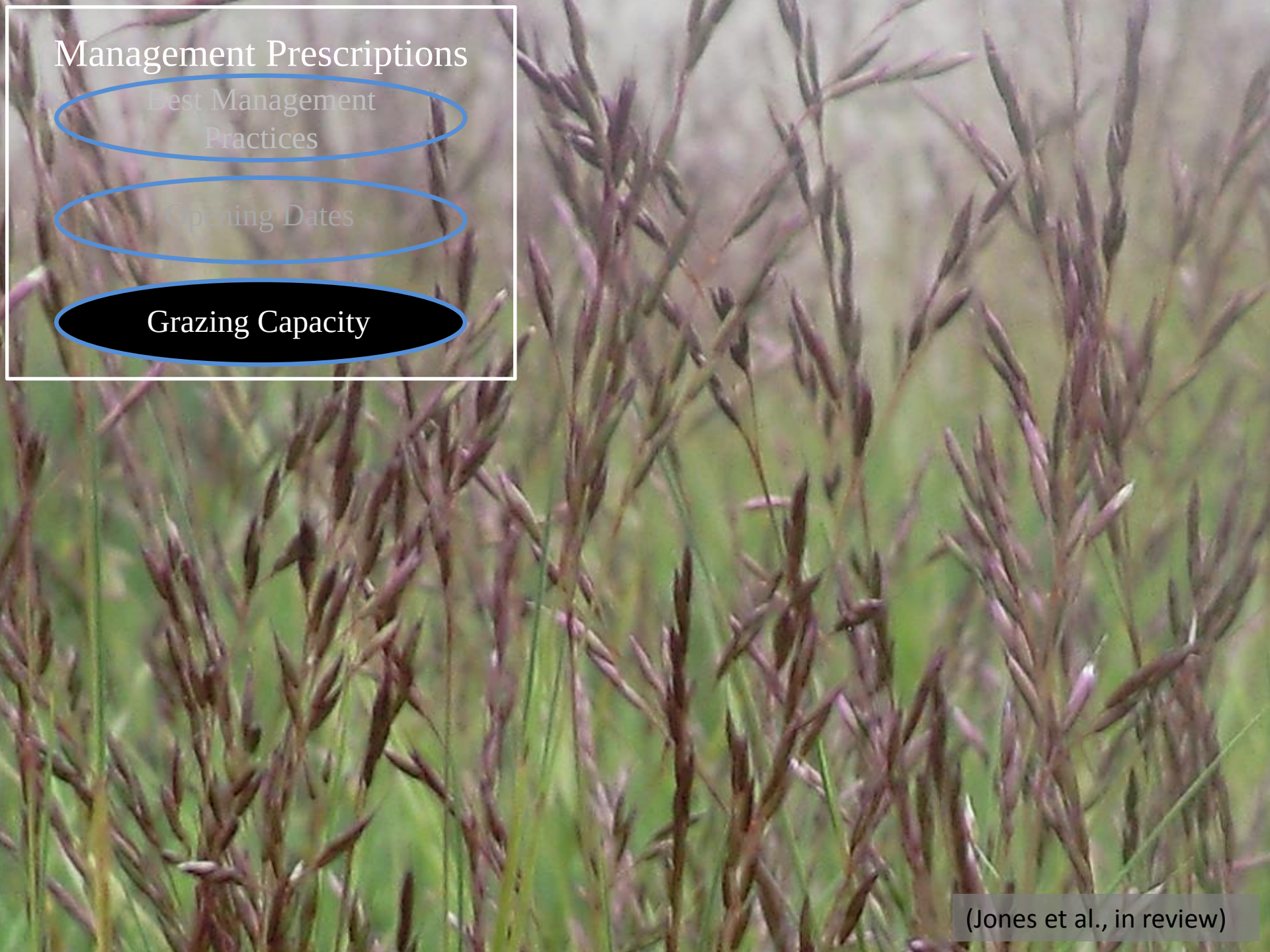
No Grazing / Supp. Feed

Strategic Release Points

Timing of Feeding

(Walden-Schriener et al., in review)

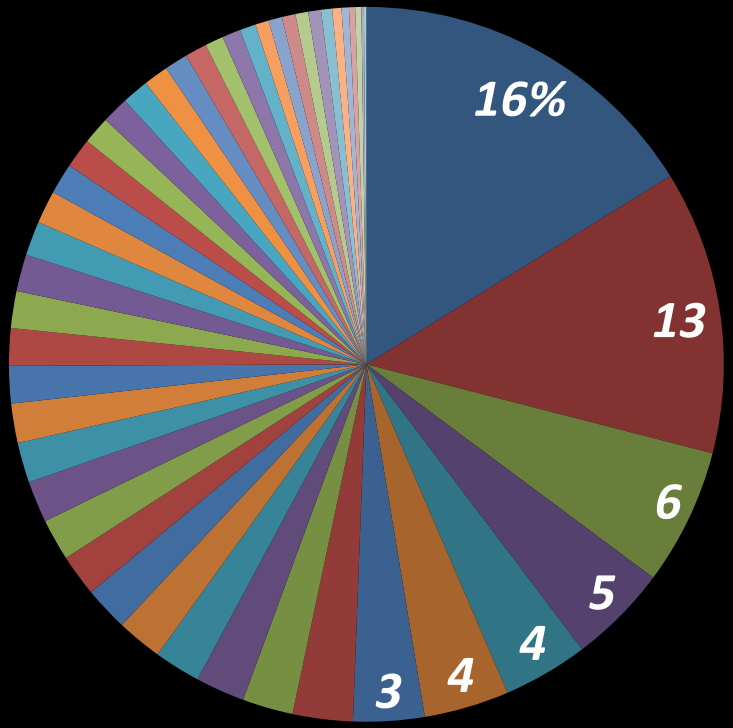
(Kuhn et al., in review)



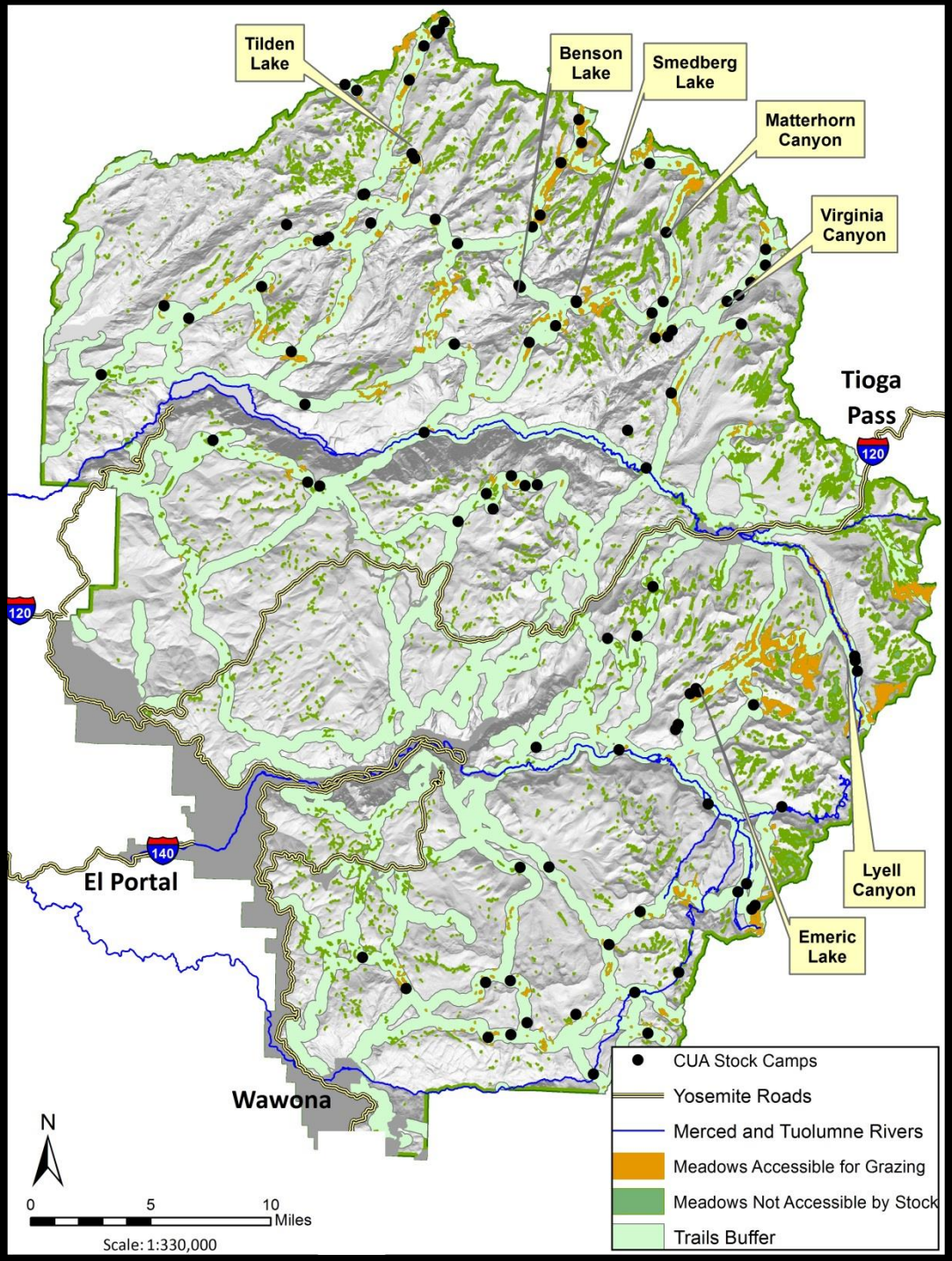
(Jones et al., in review)

Stock Use and Reporting

Mean Use (2004 – 2015)



7 locations =
50% of commercial use

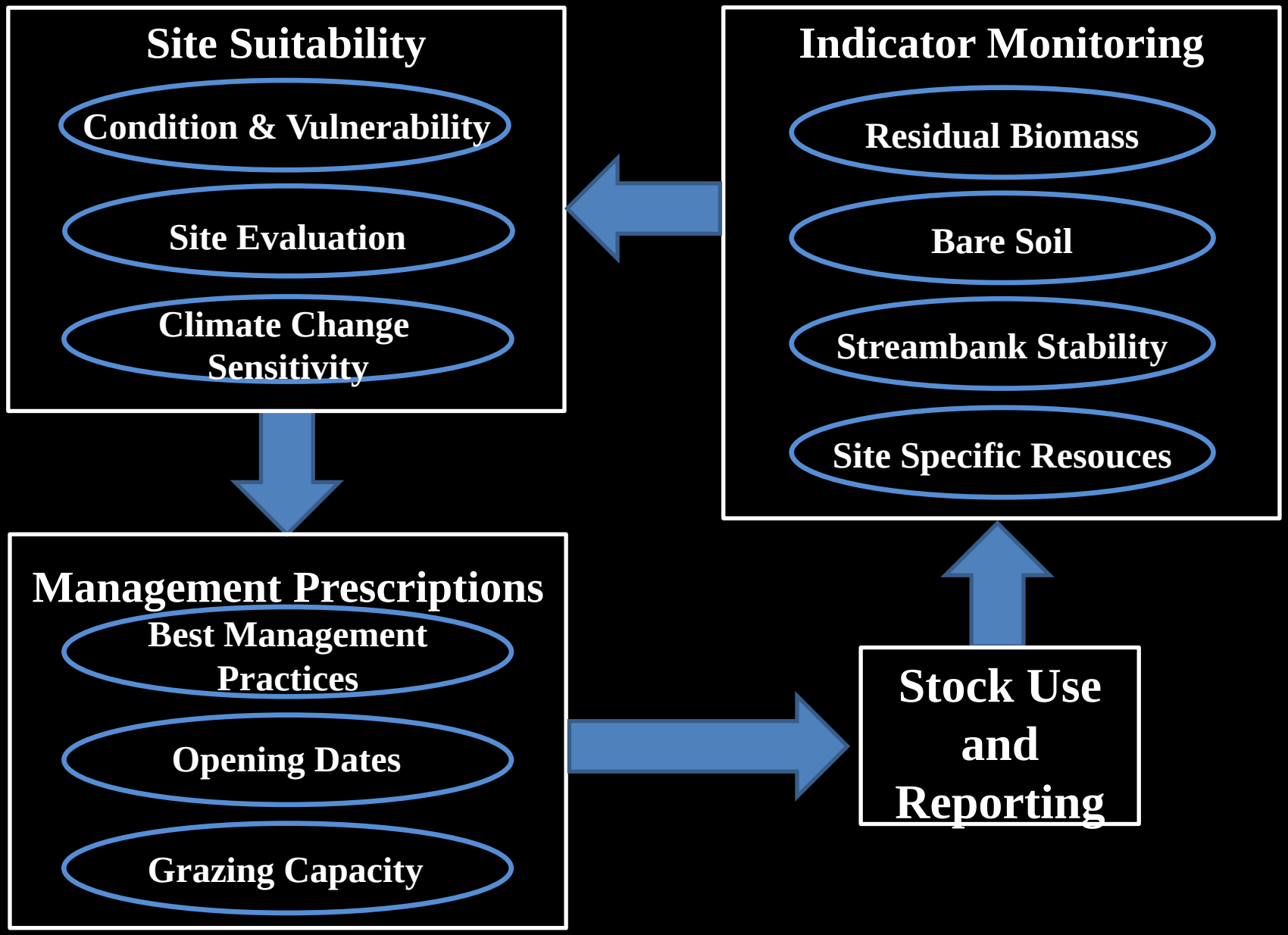


Feedback for Adaptive Management

Monitoring Program Indicators:

- Residual Biomass
- Bare Soil
- Streambank Stability
- Site Resources

Draft Pack Stock Framework



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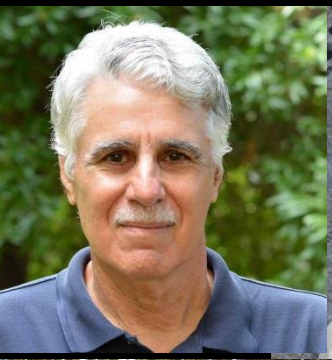
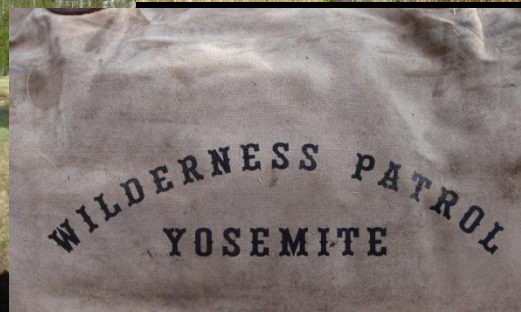
Insurmountable without support...
Thank You.





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