



Sentry Milk-Vetch: Emerging Threats and New Discoveries

Sasha Escamilla^{1,2,3,4} and Meagan Dreher²

¹ Department of Biology, University of New Mexico | ² Grand Canyon National Park | ³ Mosaics in Science Diversity Internship Program | ⁴ Environment for the Americas



Sentry milk-vetch *Astragalus cremnophylax* var. *cremnophylax*



- Perennial herb in the pea family (*Fabaceae*) and only grows within 25 feet of the rim in the cracks and crevices of Kaibab limestone.
- Endemic to Grand Canyon National Park and the only federally listed endangered plant species in the park
- Threatened by climate change, drought, low reproduction rates, competition and trampling from large mammals.
- Recently, the Kaibab Plateau bison herd on the North Rim of the Grand Canyon have increased in abundance and density. This research investigated the potential impact of bison on sentry milk-vetch suitable habitat and known populations.

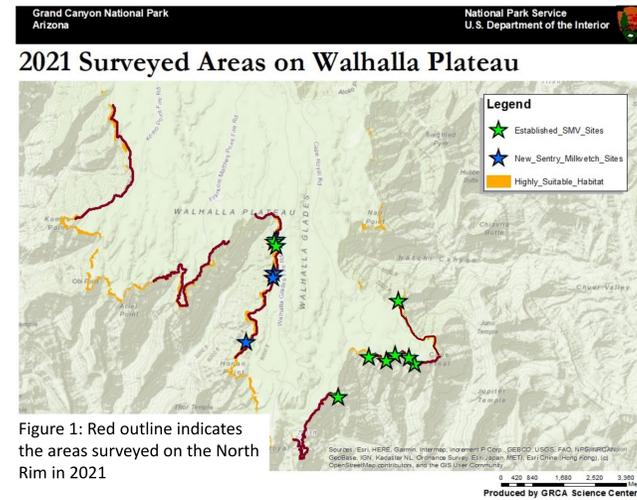


Acknowledgements

Thank you to the Mosaics in Science program for funding this research and to the GRCA Vegetation Program. Special thanks to Lonnie Pilkington, Dan Boughter, Mark Nebel and Ahsa Hakanson for their dedicated support on this project.

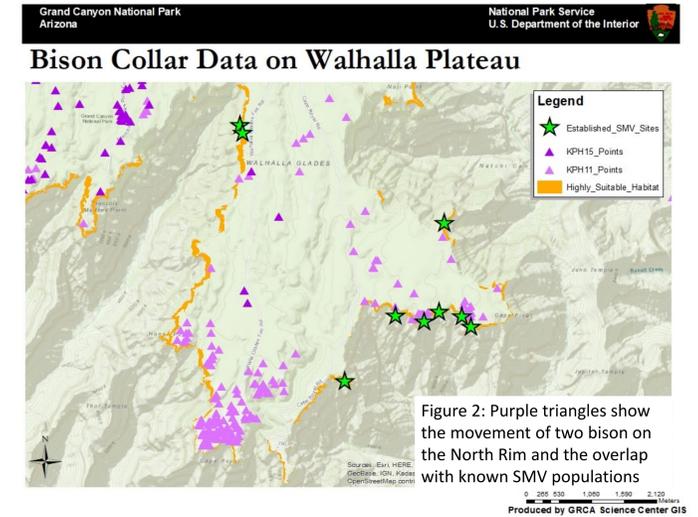
Contact Information

sescamilla@unm.edu



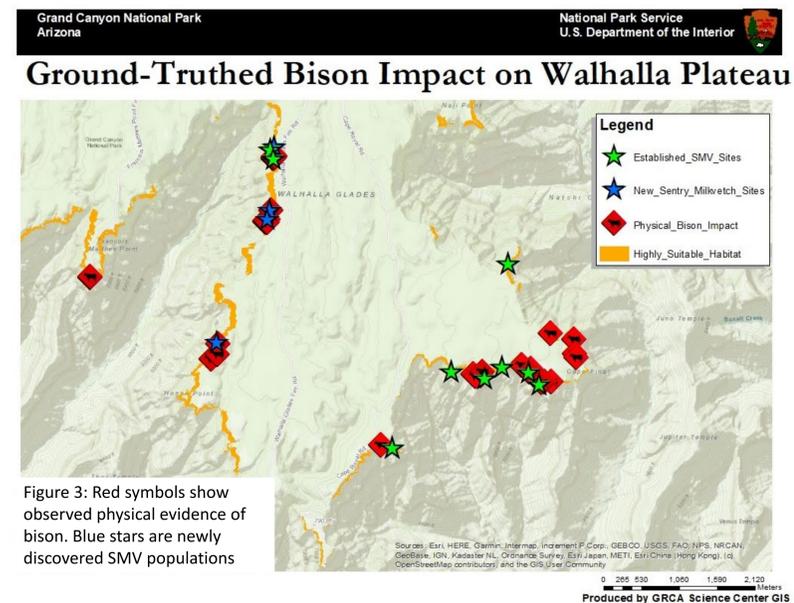
Methods

- Utilized sentry milk-vetch suitability habitat model developed by Mark Nebel, NPS. Degree of suitability is based on varying criteria including: geology, slope, proximity to rim, vegetation, soil, and physiography.
- Compared collared bison radio tracking data with suitable habitat model and locations of known sentry milk-vetch populations (Fig.2).
- Ground truthed collared bison data and evaluated the potential habitat degradation by bison within known sentry milk-vetch populations and suitable habitat.
- Surveyed target areas for previously undocumented sentry milk-vetch populations (Fig.1).



2021 Survey Findings

- During summer 2021 surveys of the Walhalla Plateau, GRCA Science and Resource Management staff and interns documented three previously unknown sentry milk-vetch populations.
- Evidence of bison was observed at multiple sites in areas of highly suitable habitat and within current sentry milk-vetch populations, including recently identified populations.
- Informal census and preliminary findings suggest there is significant decline in overall plant health and population size on both North and South Rim sentry milk-vetch populations.
- North Rim populations, while likely still in decline, appear more stable and have larger population sizes than those found on the South Rim.



Evidence of bison:

- Wallows
- Scat
- Hoof prints
- Fur on trees
- Trails

Bison fur



Bison wallow



Bison scat

Sentry milk-vetch road to recovery

- Findings support bison are having an impact on North Rim sentry milk-vetch populations and on suitable habitat.
- Populations not visited by bison are also declining in overall population size. Climate change, specifically drought, may be largely driving the decline of sentry milk-vetch.
- In order to downlist this species from the Endangered Species List, biologists at Grand Canyon will need to continue to research, monitor, protect and recover sentry milk-vetch.
- Recovery actions may involve installing more fencing around known populations and suitable habitat, conducting additional surveys, refining restoration techniques, and continuing research on various aspects of this plant's habitat requirements.

