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Revegetation using cushion plants after recreational trampling on a Colorado fourteener

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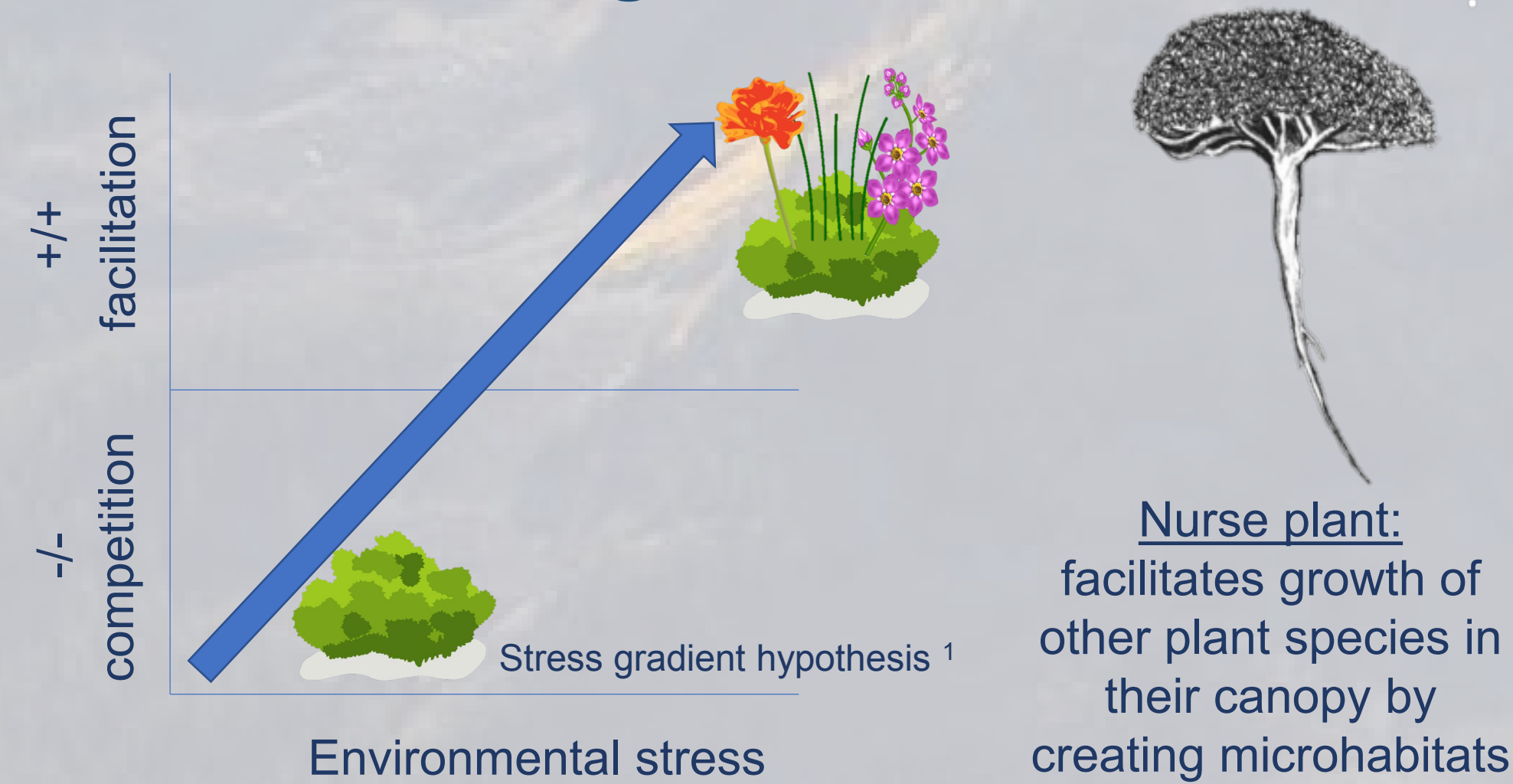
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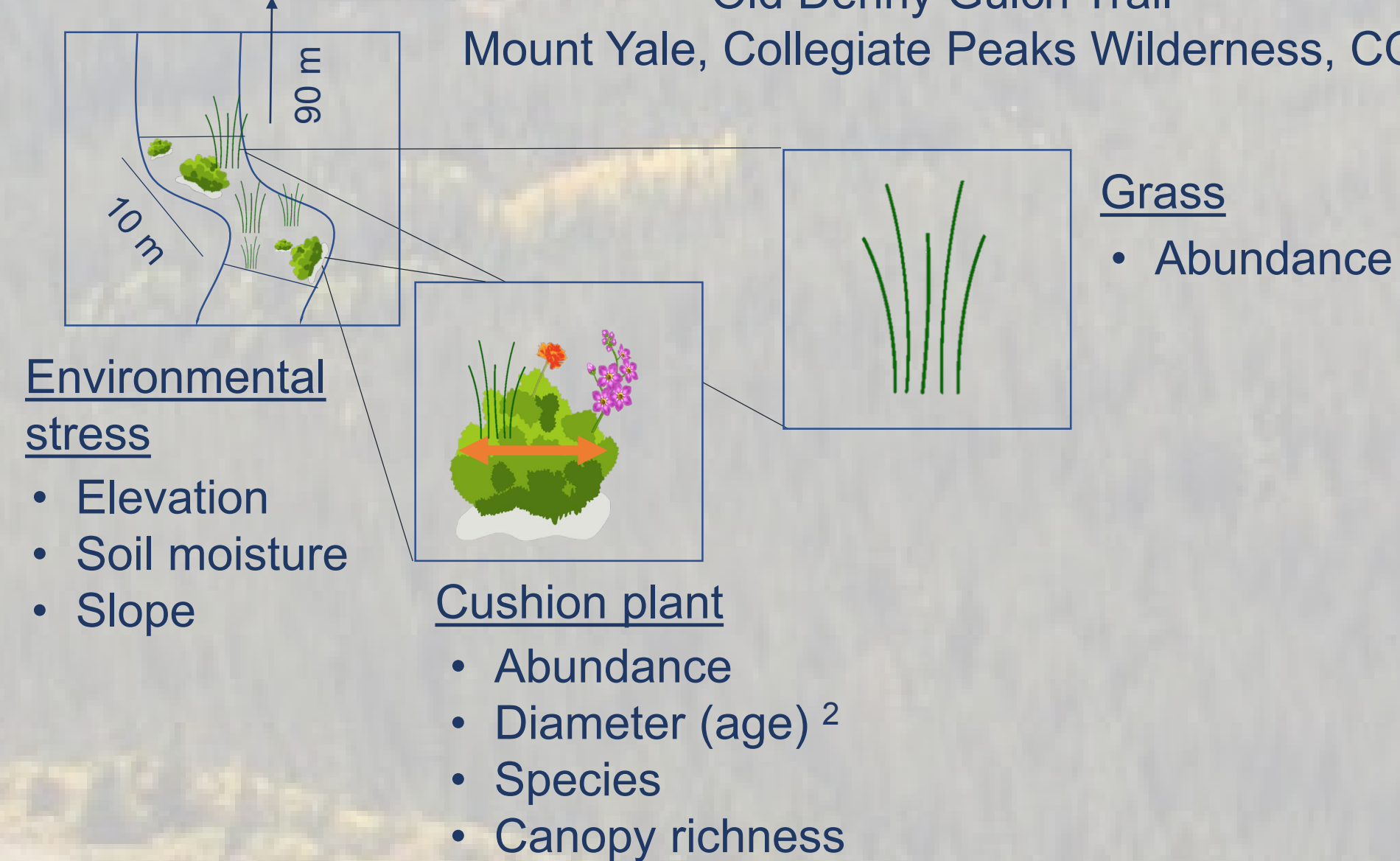
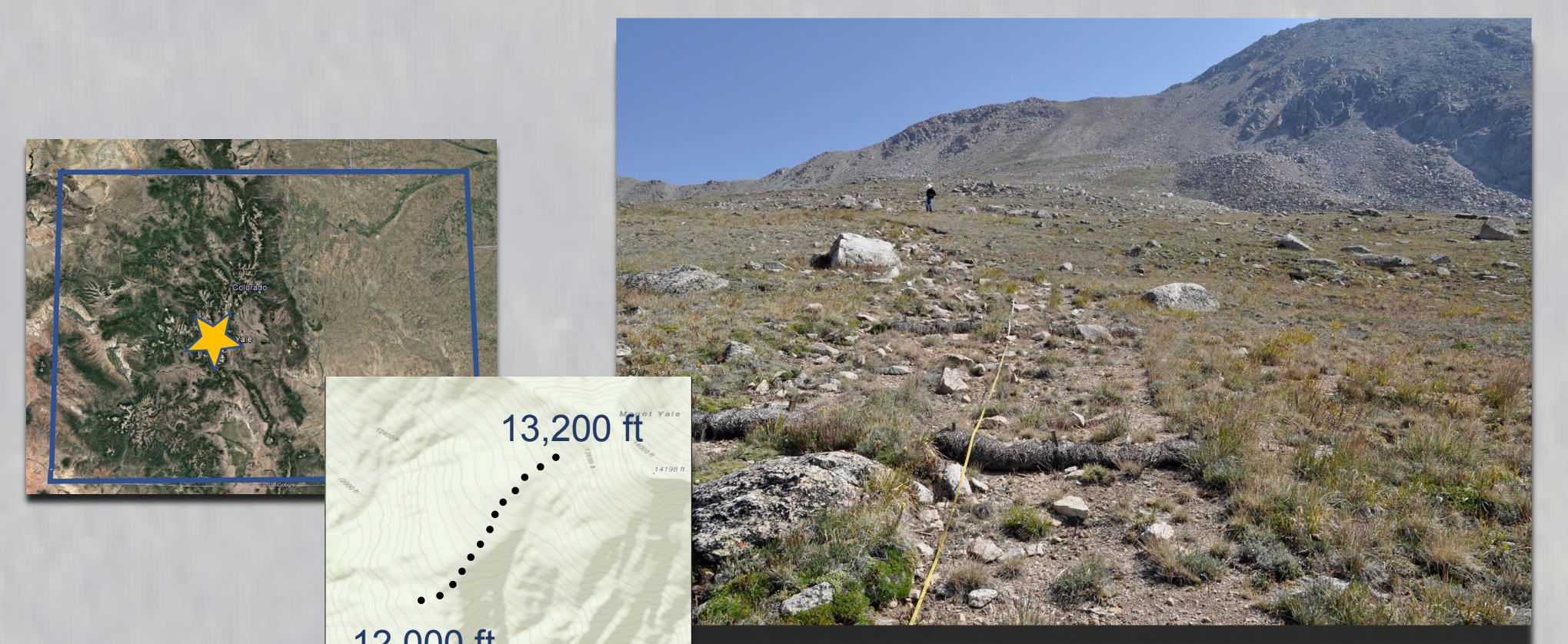
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Are cushion plants strong candidates for alpine trail revegetation?

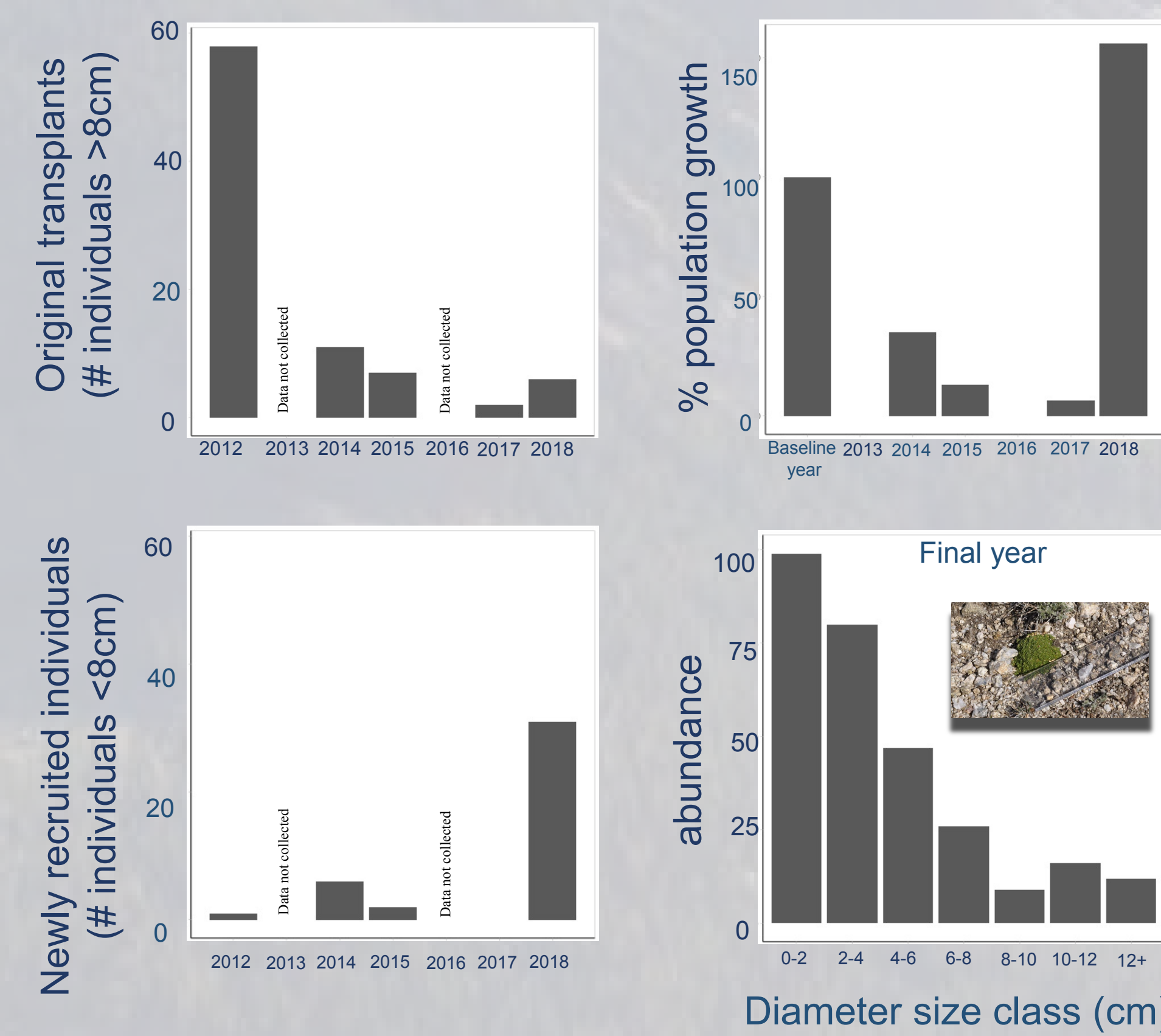


- Can they be transplanted after trampling?
- Do they transplant as well as grasses?
- Which cushion species recovers best and supports the most diverse canopies?
- Does facilitation change if conditions get too stressful?

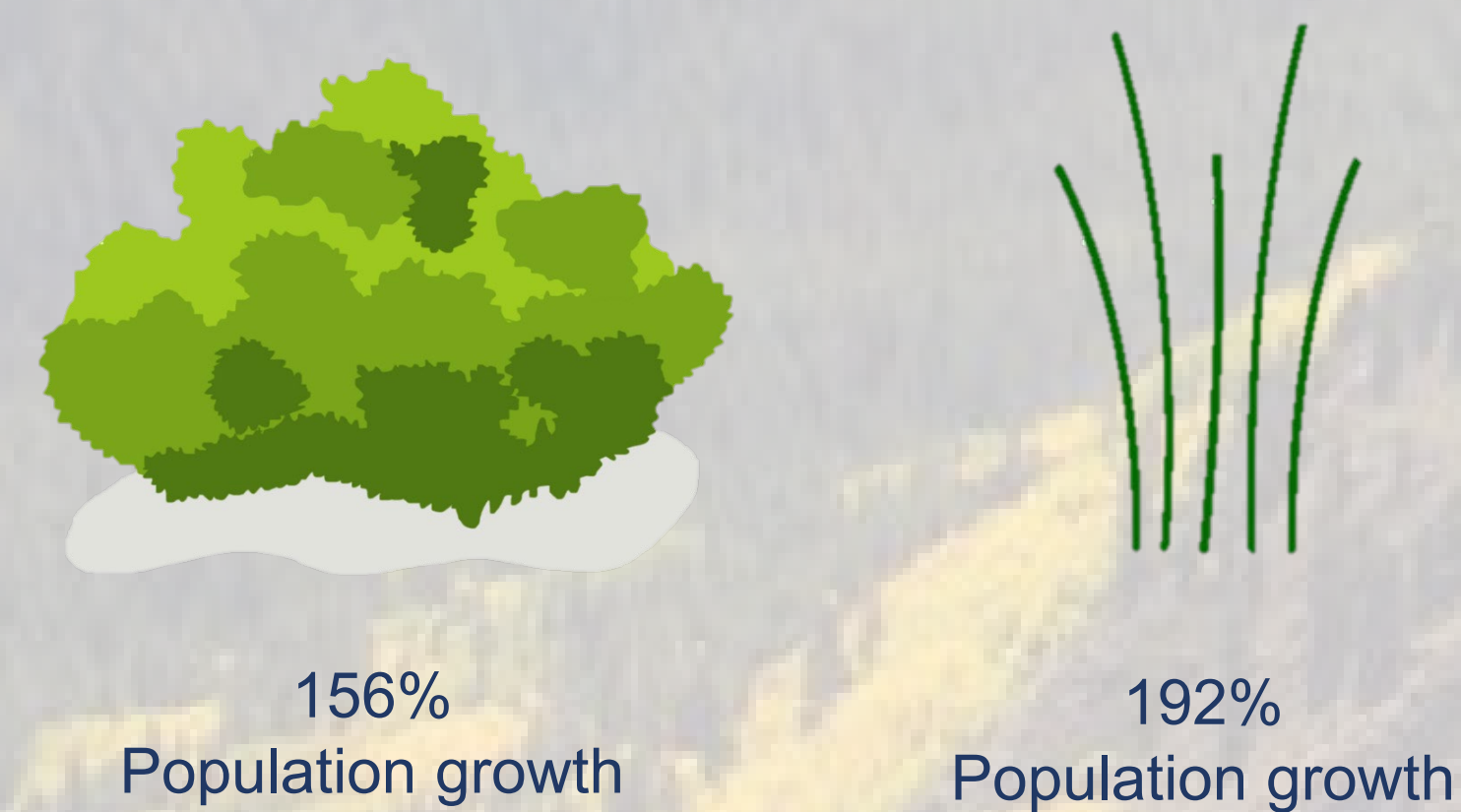
Methods



Did cushion plant transplants survive well?



Cushion plants vs. grasses



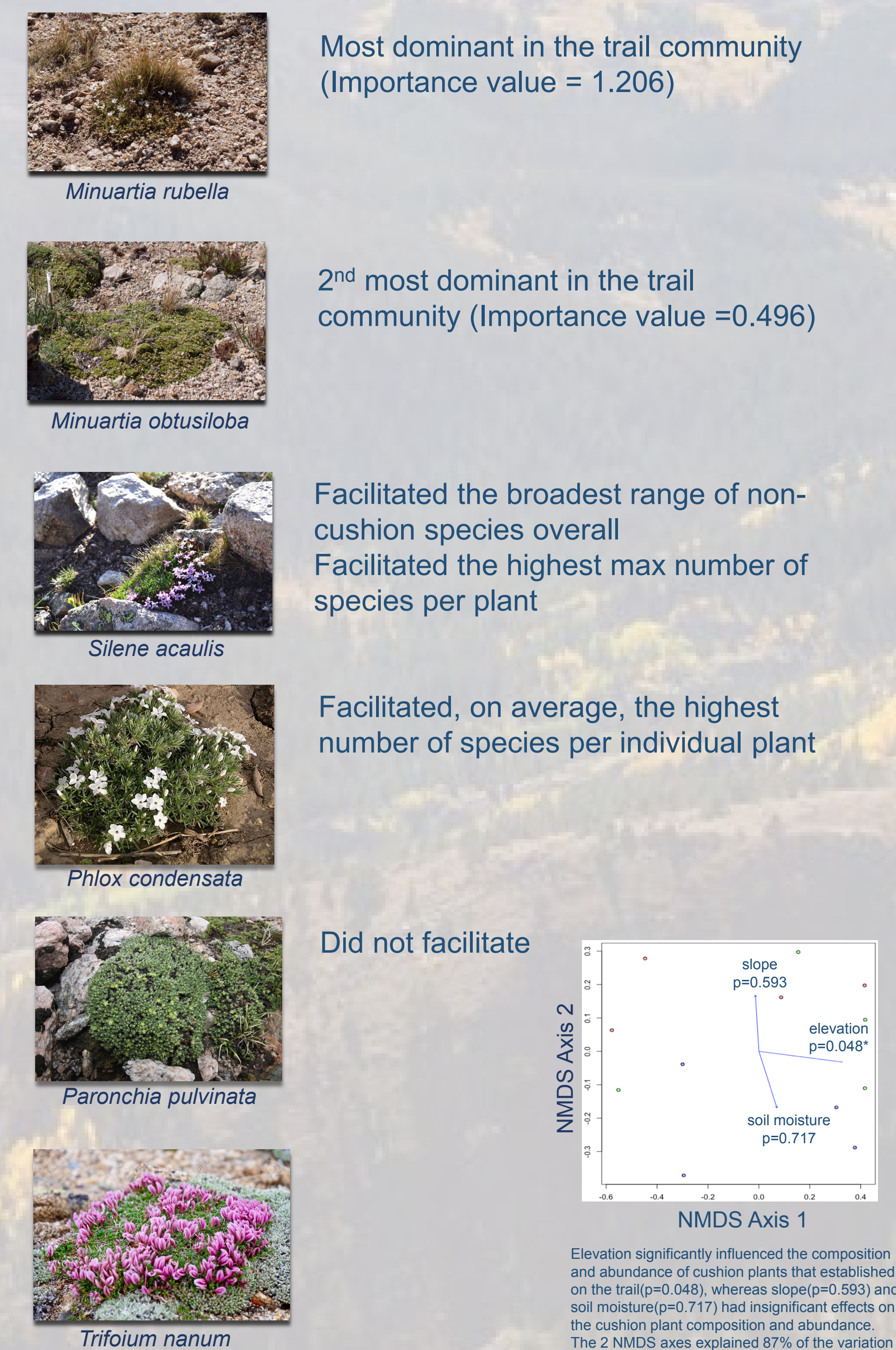
Non-cushion plant species



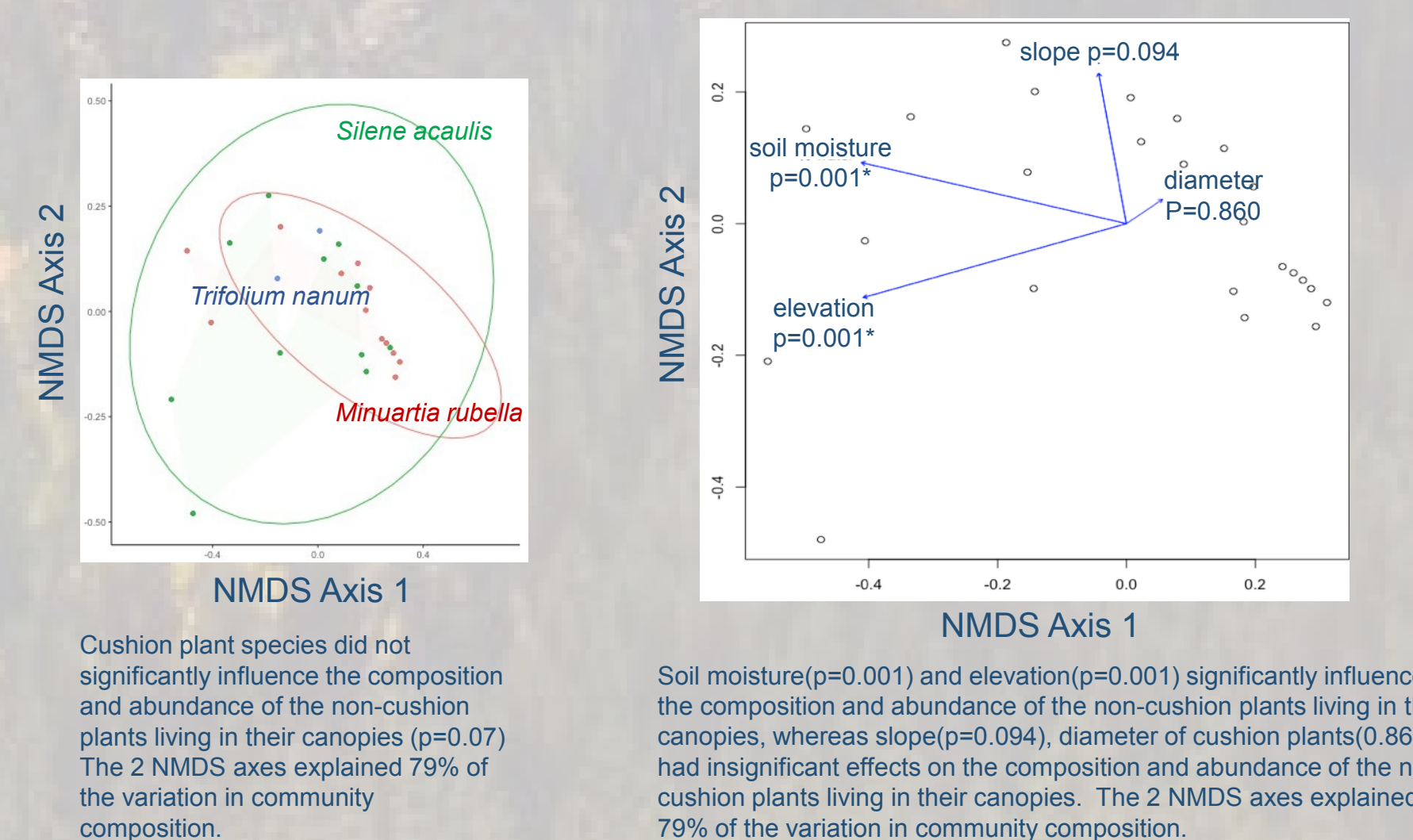
Others:

- Luzula spicata*
- Gentiana algida*
- Trisetum spicatum*
- Geum rossii*
- Bisorta vivipara*
- Trifolium parryi*
- Sibaldia procumbens*
- Tonestus pygmaeus*
- Sedum lanceolatum*
- Castilleja* spp.
- Carex* spp.

Comparing cushion plant species



Facilitated plant communities



Discussion

- Transplanting mature cushion plants is not recommended as most died after only seven years.
 - However, young recruits recovered well and may establish well enough on their own without active restoration.
- Cushion plant species did not facilitate distinct non-cushion plant species.
 - Therefore, revegetation efforts should focus on the cushion plant species that recovers the best and contributes the most plant cover.
 - *Minuartia rubella* became the most dominant in the trail community.
- Inconsistent with the stress gradient hypothesis, cushion plants did not facilitate more in stressed areas,
- Future studies are needed to:
 - Research new alpine revegetation techniques (seeding, transplanting younger plants)
 - Understand alpine succession following disturbance.

References

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