

Plant cover & diversity on a young prairie-style green roof relative to slope position & planting assemblage

Green roofs are an important tool in urban areas for ecosystem services. Green roofs in the southwest US require additional design specifications over northern US roofs (e.g., drought resistance, extreme heat tolerance). A test roof in North Central Texas was modeled after a local natural prairie system, Goodland Limestone Prairie Barrens/Glades, and incorporated harvested **native prairie soil (including its seed bank)** into the planting medium. As part of a larger effort to determine the efficacy of a biomimicry approach to this roof's design, we examined **plant cover & species richness** relative to 2 roof **slope positions** (up- & downslope) and 3 pre-determined **planting assemblages** (cactus, grass, yucca) at eight six-week intervals beginning 20 months after the roof was first planted. The planting assemblages each centered around a single dominant perennial species with an additional mix of 4 perennials and 1 annual.

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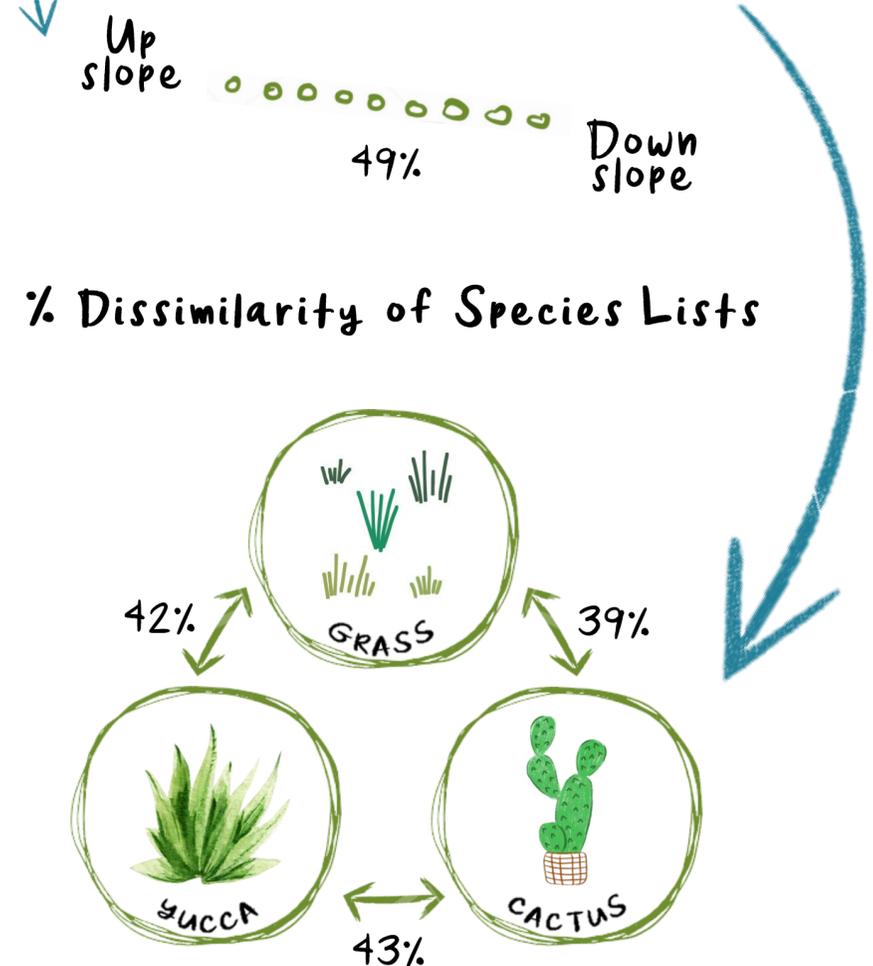
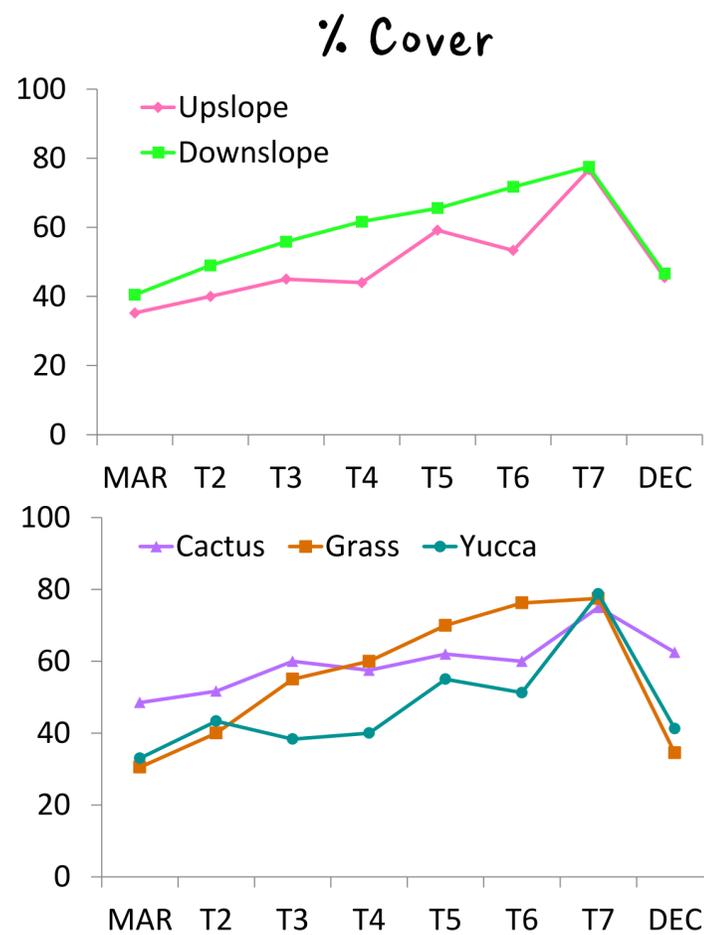
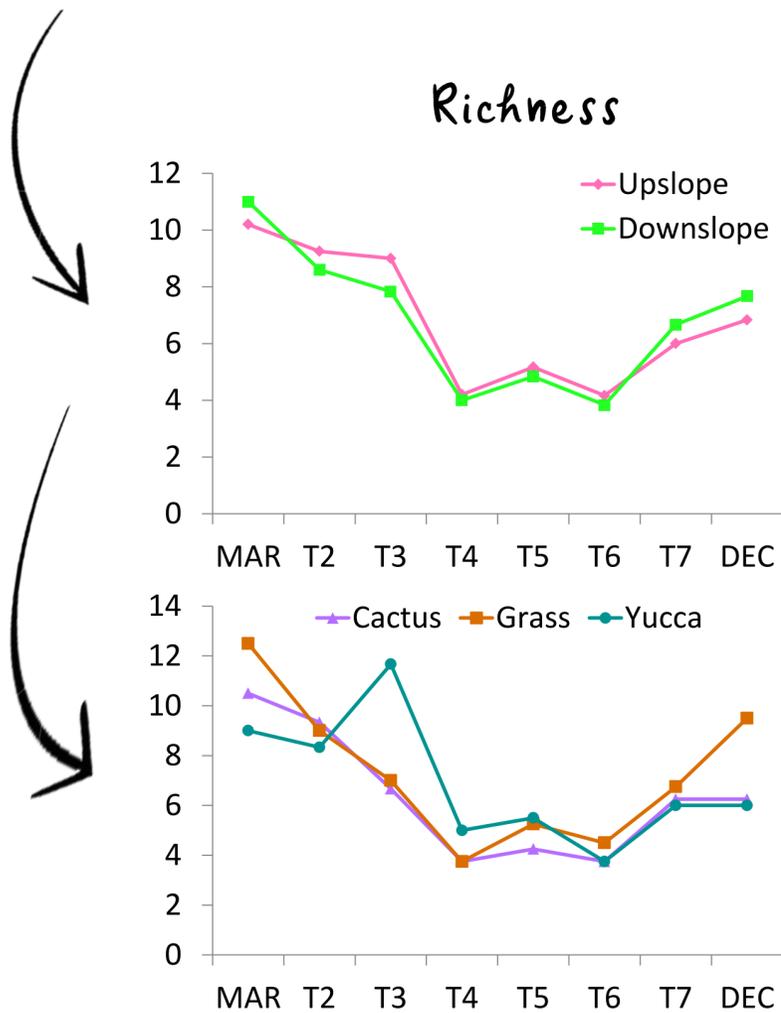
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Two years after planting a prairie-style green roof...

Richness does not differ relative to slope position or planting assemblage...

But cover is greater downslope than up...
(no trend for cover by assemblage)

And species composition differed more by slope position than by assemblage



WHY DOES IT MATTER?

(1) Slopes are a way to create niches on green roofs and therefore encourage higher diversity. Here the richness didn't differ between slopes but the species composition did, so total roof diversity still increased.

(2) The roof design included three diverse planting assemblages but each used the same soil with a homogenous seed bank. Our results could suggest that design effort could be saved by letting the slope do the work.

(3) The biomimicry design was successful. The patterns of both richness and cover over time mimic what we see in the native prairie analog: a system dominated by annuals that flourish with the spring and fall rains and then subside.

(4) IT MIGHT NOT MATTER ACTUALLY. The roof was still establishing during this study. Reexamination at a later date should yield different results, as the effect of the perennial dominants on their microhabitats should be greater.