

Roadside Maintenance Practices Influence Plant Migration along Freeways

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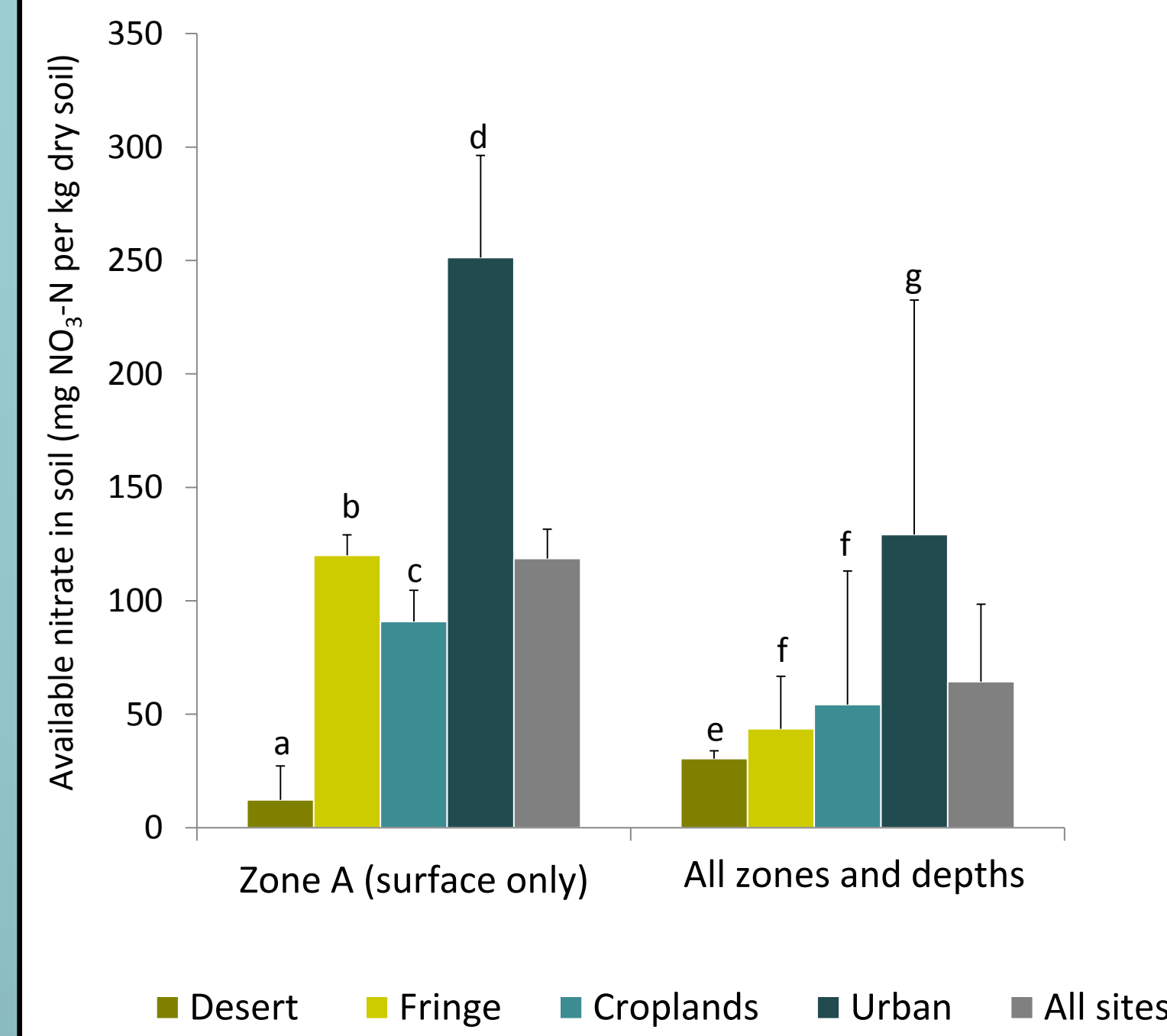
Plant Migration and Urban Areas

- Transportation corridors connect urban and undeveloped areas, providing relatively homogeneous conditions with elevated nitrate availability through the developed area
- Most seeds trapped at developed sites were adapted for wind dispersal
- Seed bank contents are similar while plant species composition varies significantly between landscaped and non-landscaped sites
- Maintenance practices in the Phoenix area favor disturbance-tolerant plants with small seeds
- Successful plants include both native and non-native species with similar characteristics

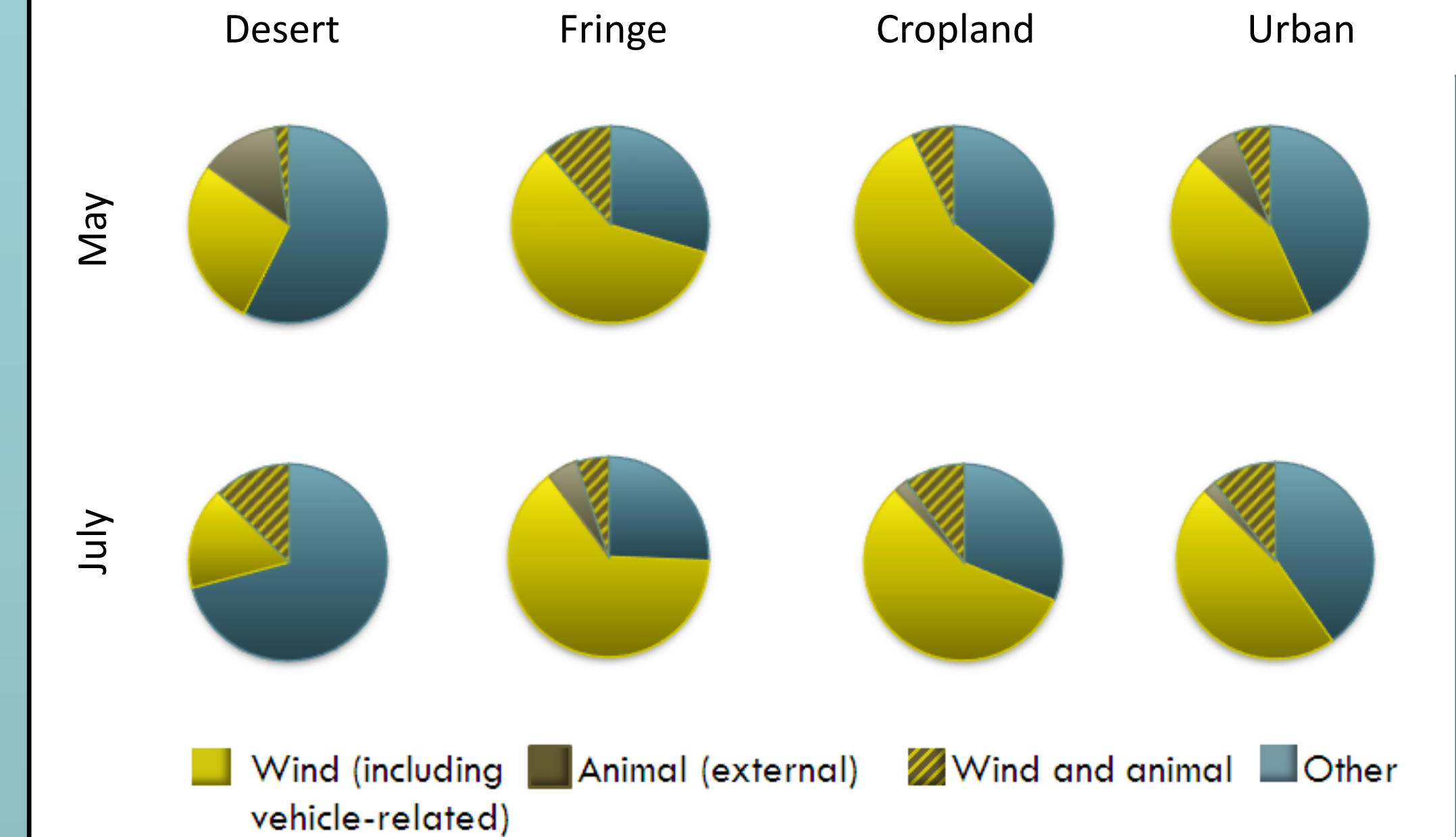
Stages of Plant Migration

Stage	Method
Dispersal	Seed trapping
Germination	Seed bank
Establishment and Reproduction	N availability, Plant surveys
Spread	Synthesis

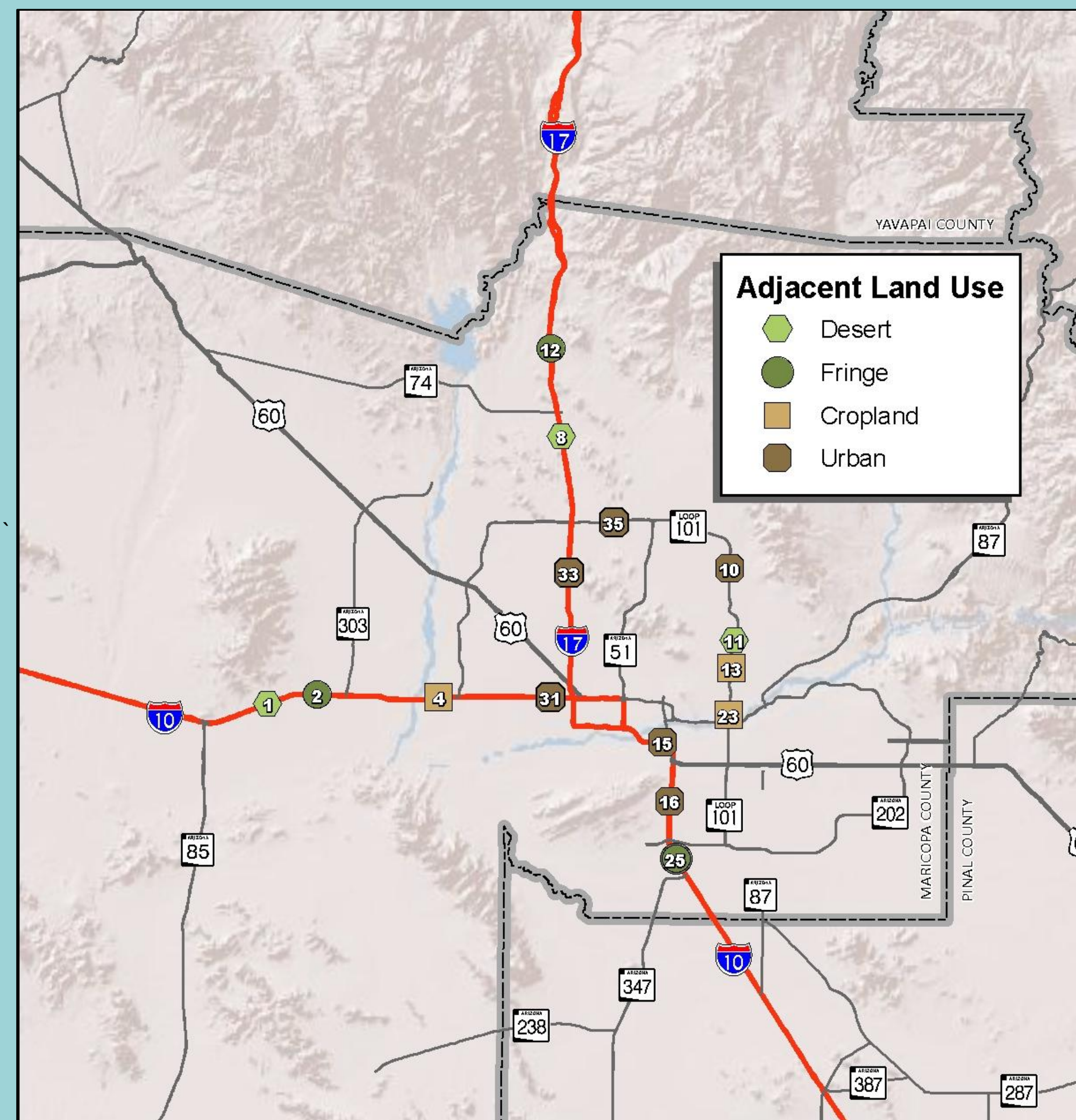
Nitrate availability



Seed Dispersal Traits



Study Sites



“Desert” sites: Non-landscaped verges, adjacent to desert



“Fringe” sites: Non-landscaped verges, adjacent to landscaped land



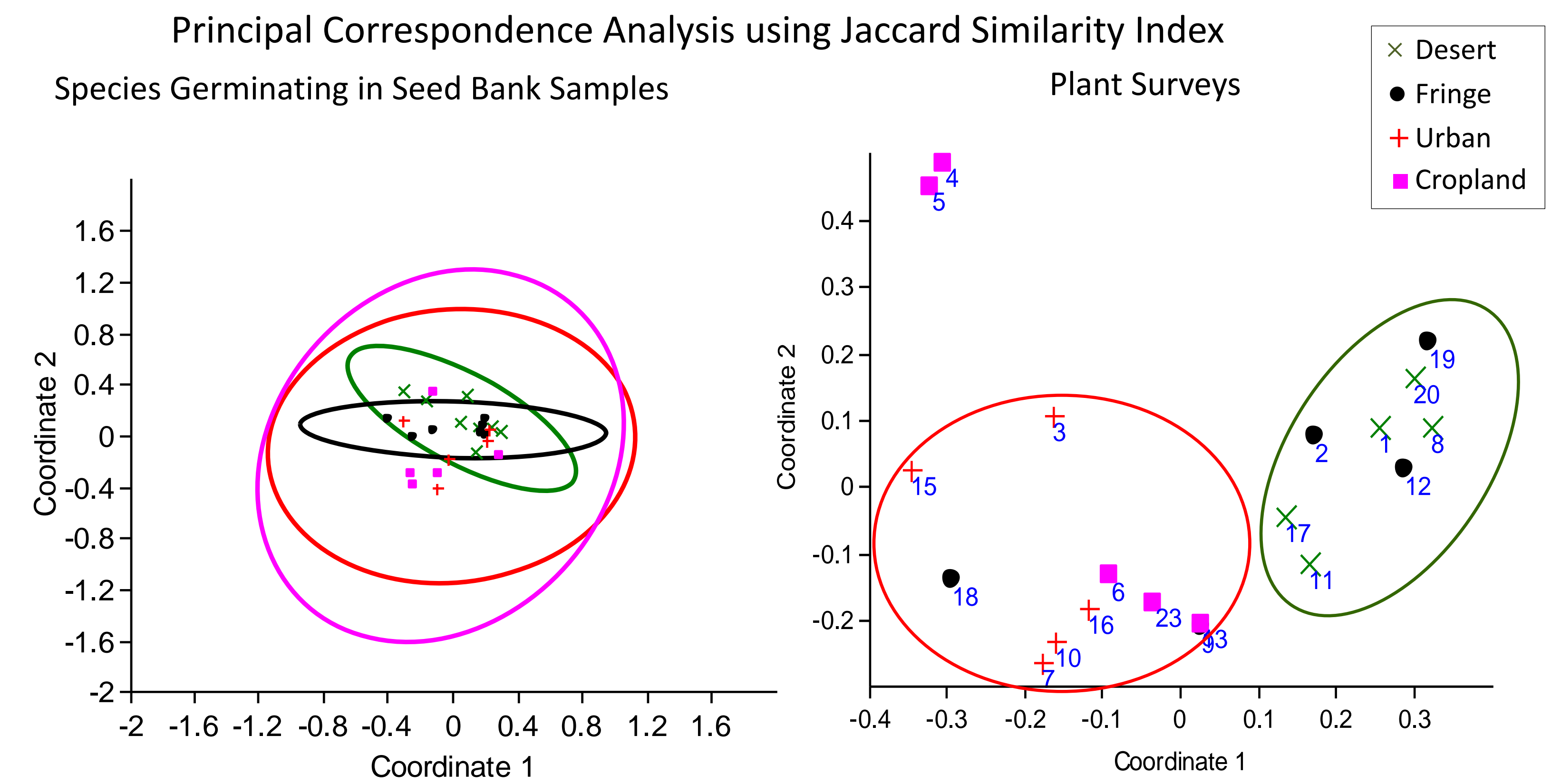
“Cropland” sites: Gravel verges adjacent to croplands

“Urban” sites: Gravel verges adjacent to landscaped land



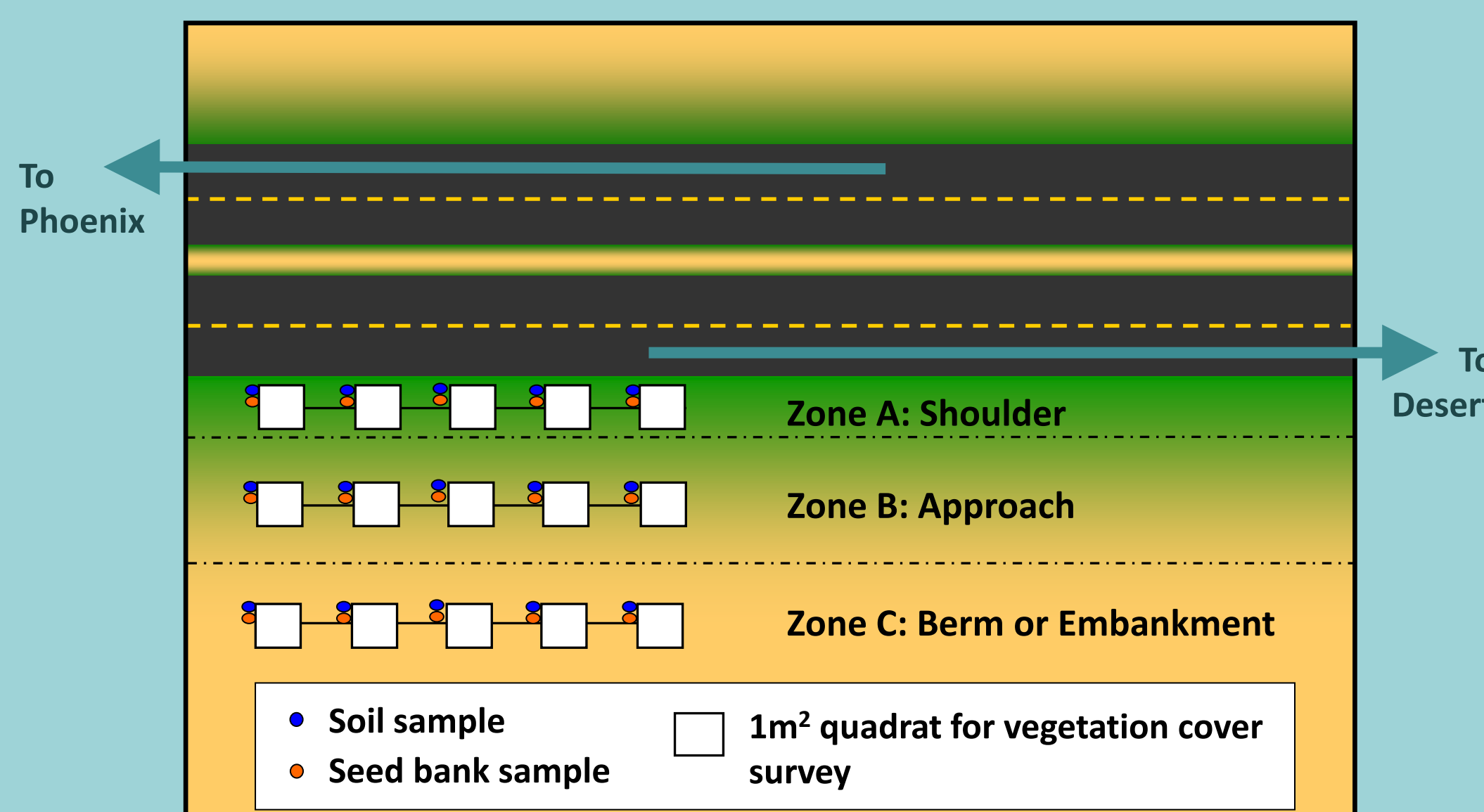
Land adjacent to “urban” sites had higher density development than land adjacent to “fringe” sites.

Seed Bank Germination and Plant Survey Results



- The seed bank contents were fairly similar, while the species composition of the plants growing at the landscaped and non-landscaped sites differed significantly

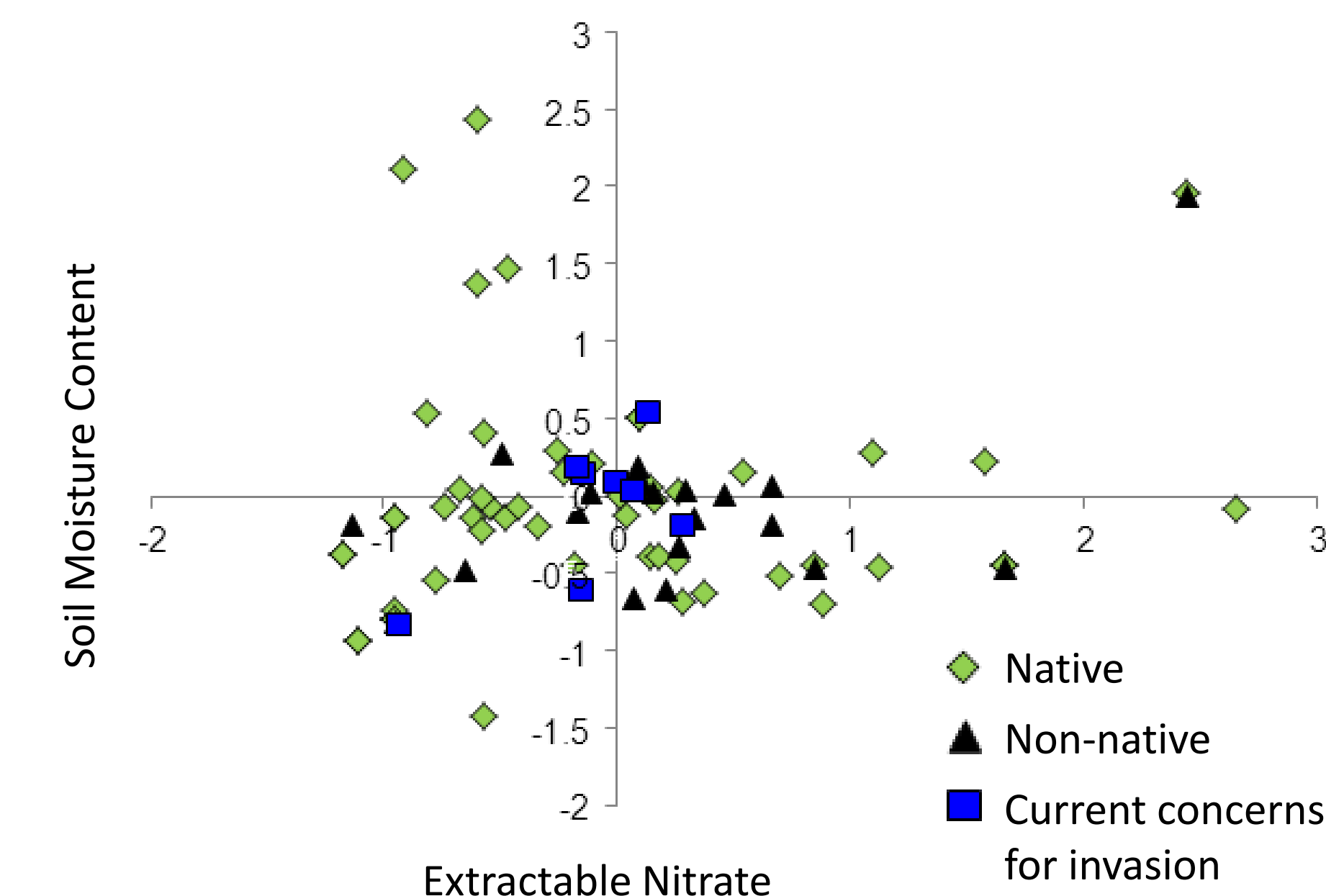
Sampling Design



Ecological Effects of Landscaping and Maintenance Practices

- Street sweeping: selective removal of seeds by size?
- Gravel mulch: traps seeds along the roadside
- Pre-emergent herbicide: prevents establishment of plants from the seed bank
- Drip irrigation with reclaimed water: adds nitrogen
- Pruning and removal of plant matter: removes nitrogen and carbon

Native vs. Non-native Species



- Plants occurring spontaneously at the sites included native and non-native species across a range of functional trait types (CCA results).

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