

Urban riparian soils:

A case study of Shoal Creek restoration in Pease Park

*Darcy Nuffer, RLA
Mateo Scoggins
Ana Gonzalez*



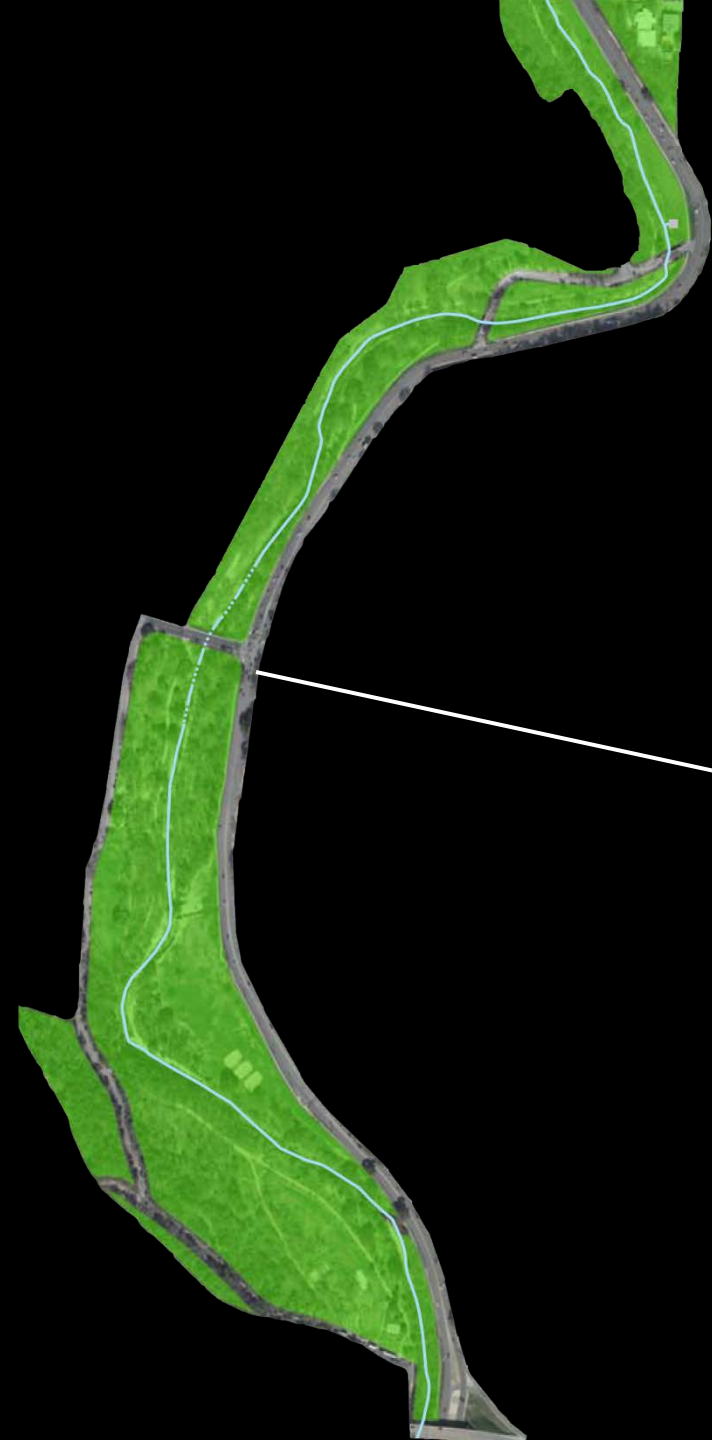
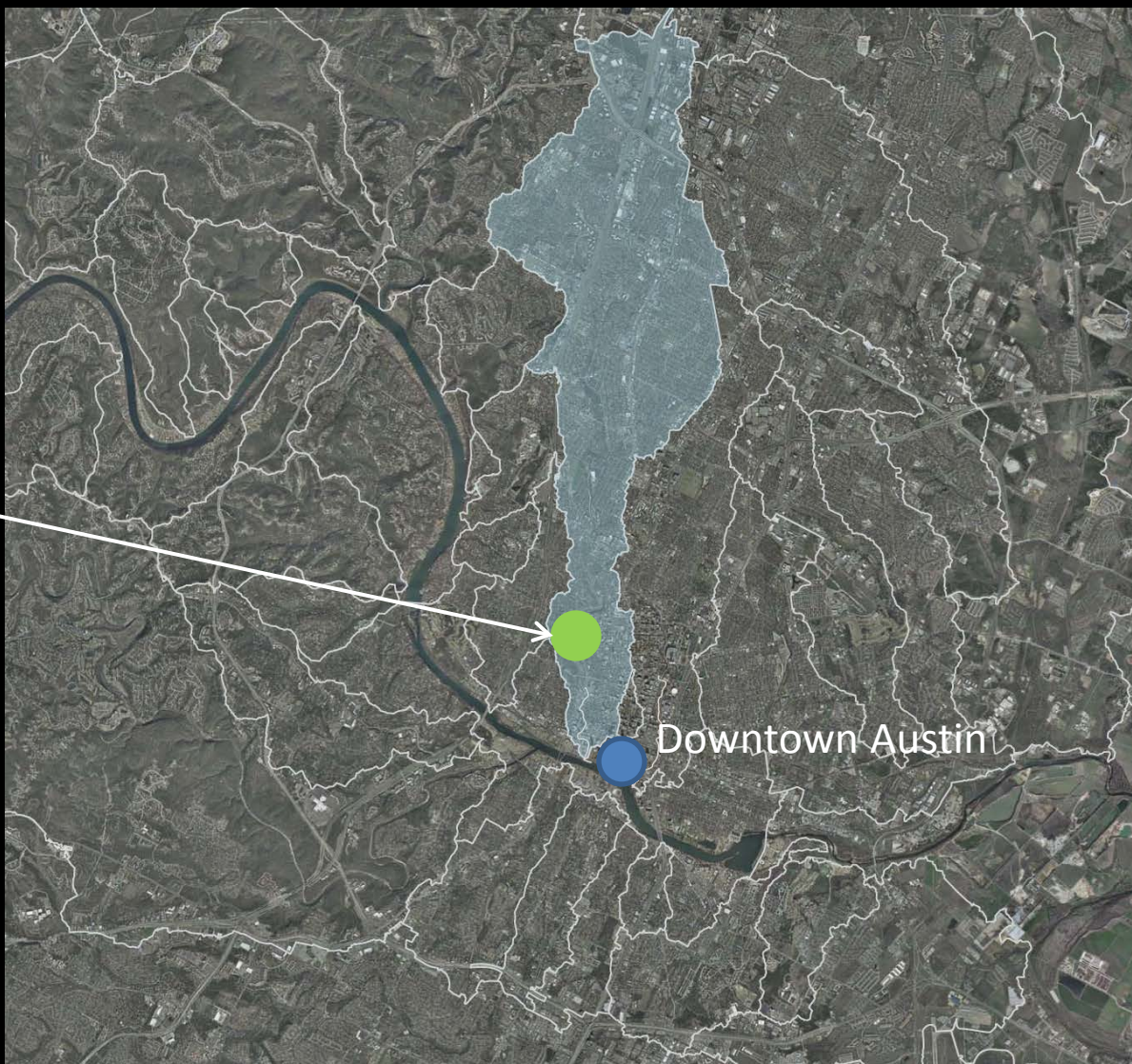
City of Austin

**WATERSHED
PROTECTION**

Shoal Creek Restoration – Pease Park



Shoal Creek Restoration – Pease Park



Pease Park

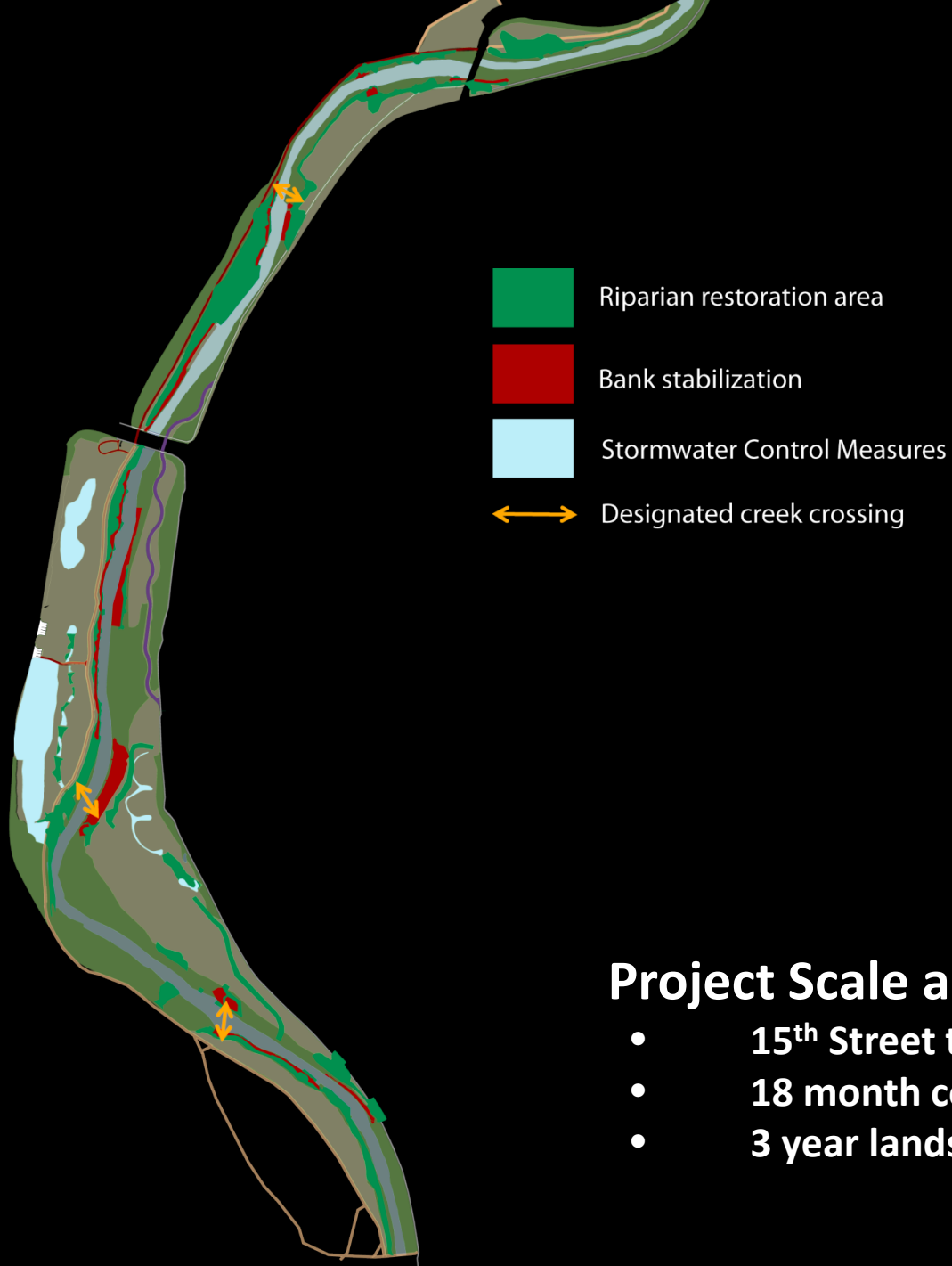
- Popular inner-city park
- Site disc golf course from 1989 – 2011
- Near UT and downtown



Shoal Creek

- Built-out, urban watershed
- Frequent flash flood events





Project Scale and Scope

- 15th Street to 28th Street
- 18 month construction phase
- 3 year landscape maintenance phase

Landscape Restoration Goals

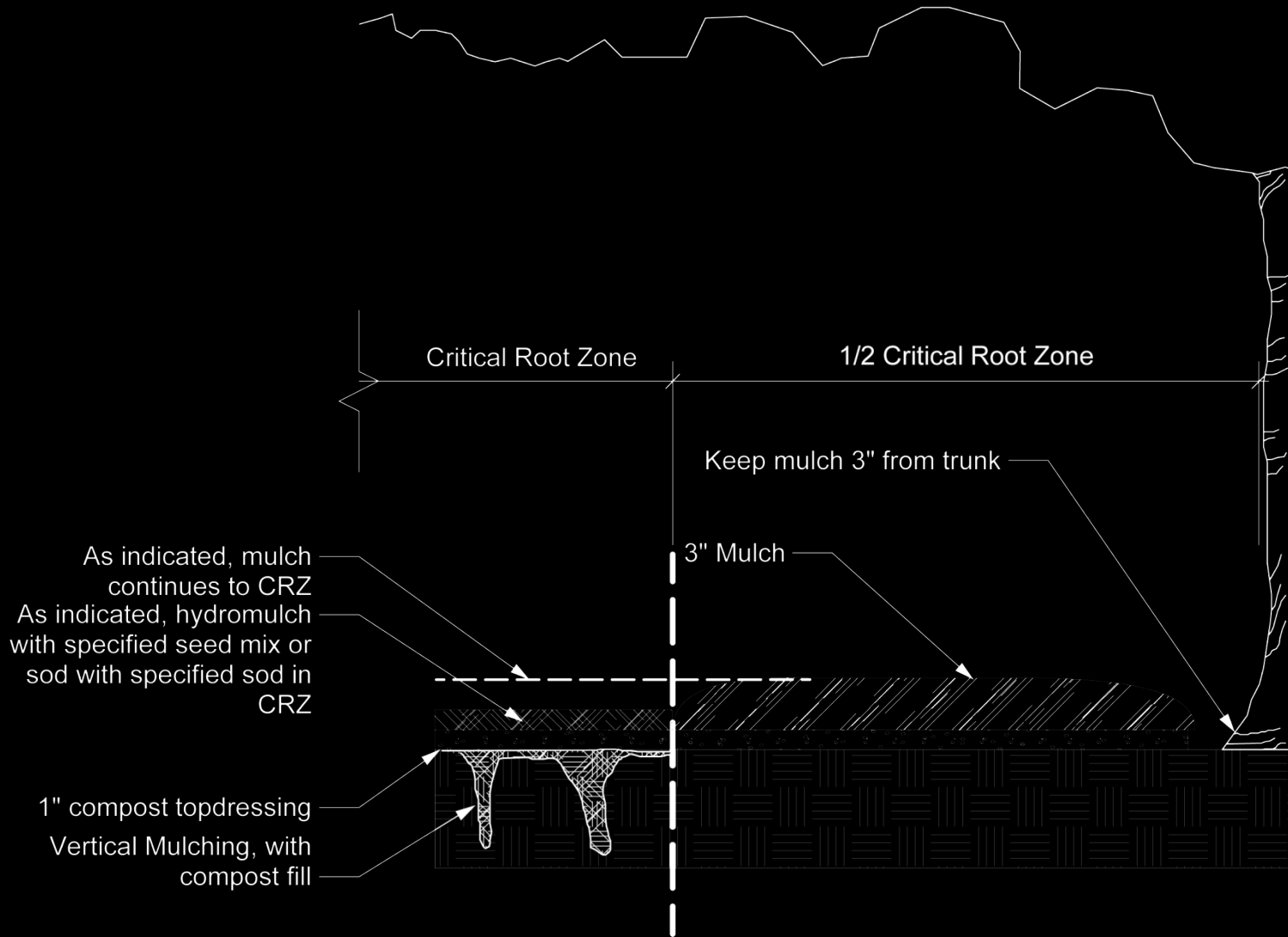
- Increase infiltration capacity throughout the park
- Improve health of existing trees
- Increase native understory/reduce future erosion



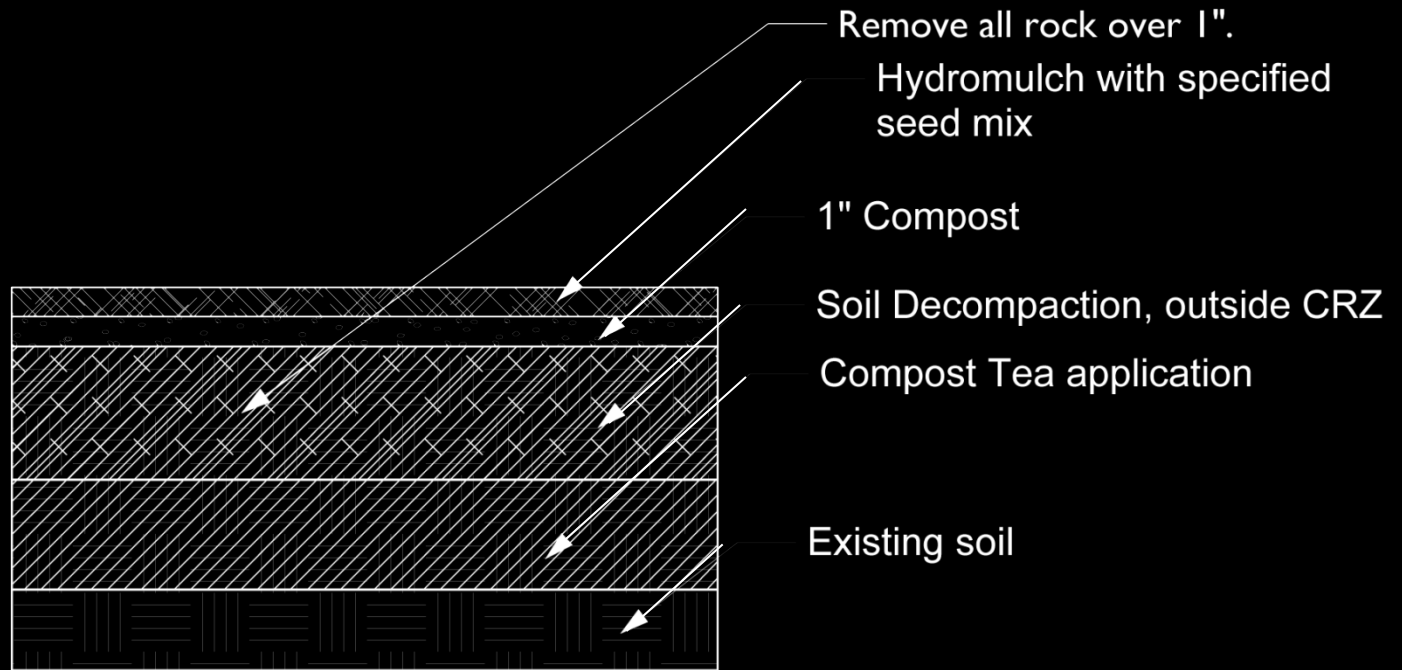


Soil Restoration Strategy

- Restore soils within critical root zones of protected and heritage trees
- Restore compacted lawn areas
- Remediate compaction due to construction activity



Soil restoration under existing trees



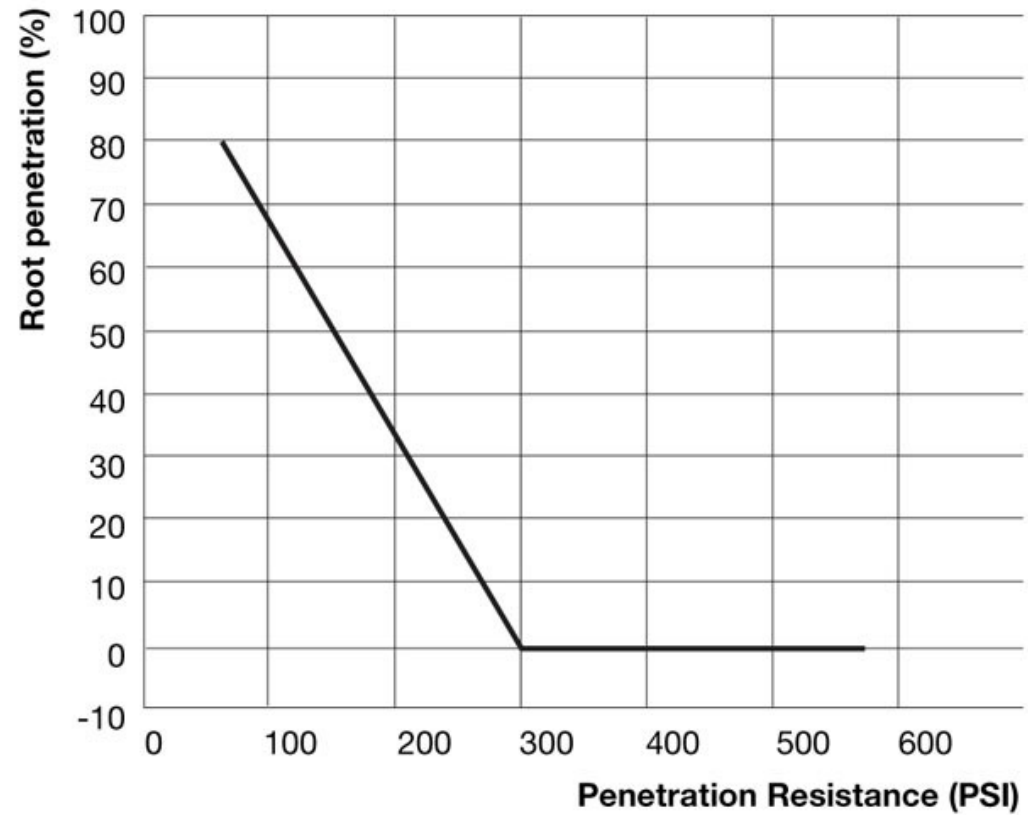
Soil restoration in compacted lawn areas



Landscape Restoration Metrics

- Soil testing pre-, during- and post-construction
 - Chemical characteristics
 - Biological activity – Solvita C02 Burst, bacteria and fungal counts
 - Organic matter
 - Compaction

Pre-construction compaction



Diagnosing soil compaction using a Penetrometer, Penn State College of Agricultural Sciences, <http://pubs.cas.psu.edu/freepubs/pdfs/uc178.pdf>

Pre-construction compaction



*Custer's Meadow
Degraded Site:
160 psi @ 6"*

*Upland Reference site:
220 psi @ 6"*



*"Area 9" Degraded Site:
300 psi @ 6"*



Landscape Restoration Process: Specifications

Required a Restoration Specialist be part of the construction team

- Defined role and qualifications
- Responsible for reporting on restoration activities at weekly construction meetings
- Responsible for restoration-related submittals and coordination with other construction scheduling

Landscape Restoration Process: Specifications

Soil testing during construction

- Testing of any soils brought to site: amended topsoil, compost
- Testing of site soil prior to beginning soil-related work –
 - Soil moisture - Tensiometer readings to ensure proper workability
 - Compaction - Cone penetrometer readings prior to planting/seeding
 - Design team inspections at various stages of soil preparation



Landscape Restoration Process: Specifications

Soil testing post-construction

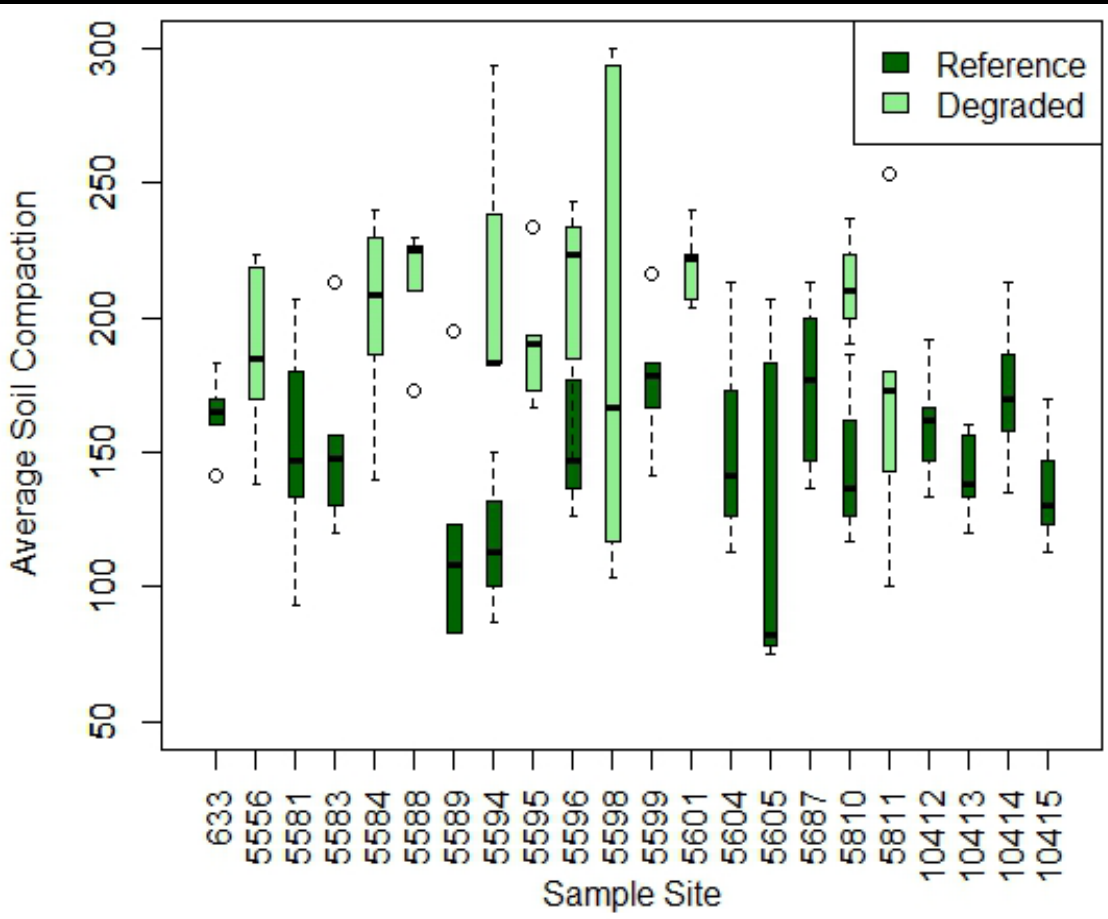
- Repeat chemical, biological, and compaction tests annually through landscape maintenance phase

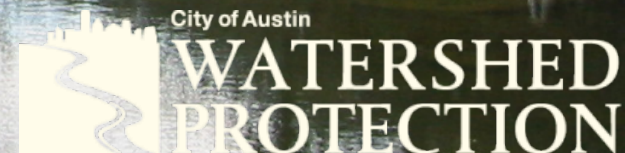


Long term monitoring

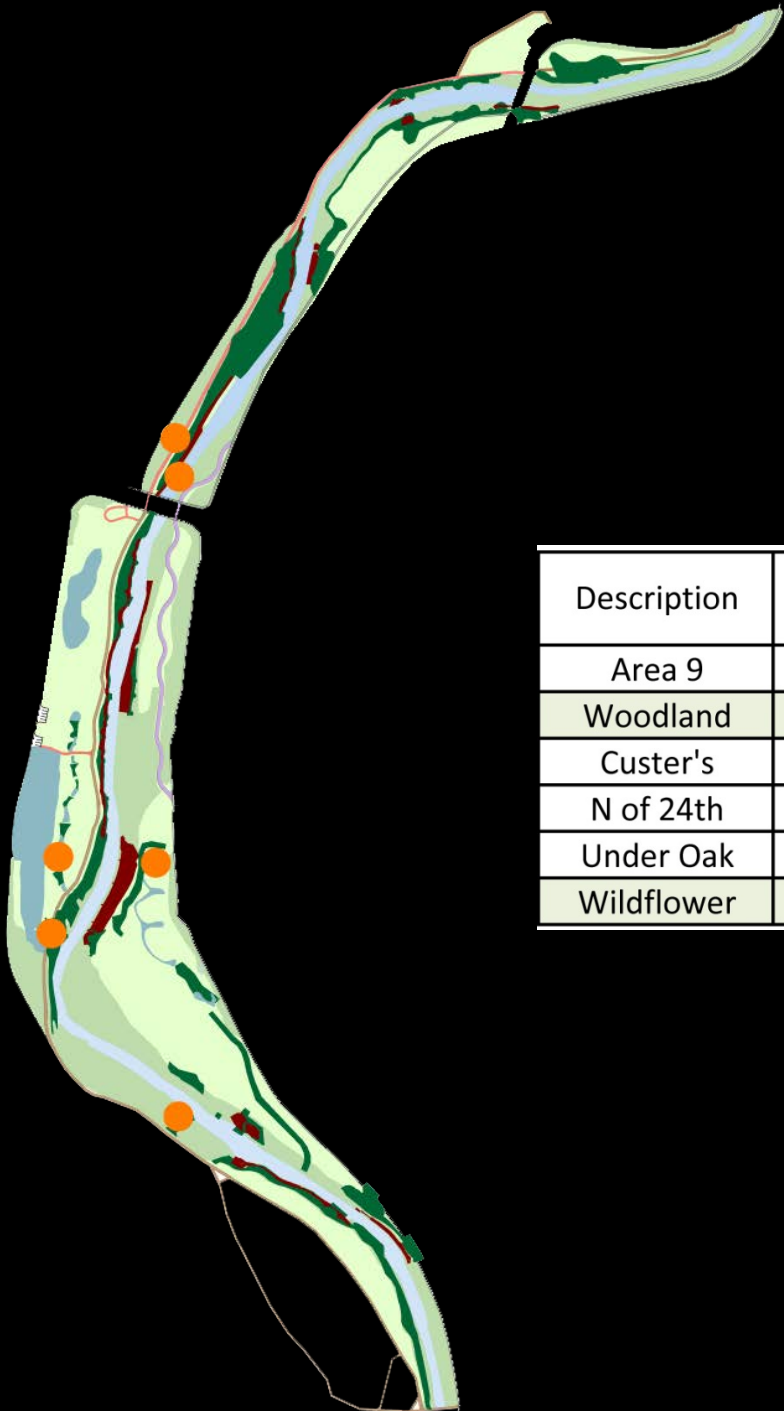
Riparian Functional Assessment

- Measure degraded and reference sites throughout Austin





Thank you!



Description	Character	%OM Humus	Solvita ppm	TF/TB ratio
Area 9	Degraded	1.55	7.6	0.69
Woodland	Reference	5.2	53.95	1.37
Custer's	Degraded	4.3	48.59	1
N of 24th	Degraded	0.8	5.14	0.57
Under Oak	Degraded	1	36.23	0.89
Wildflower	Reference	0.3	5.13	0.85