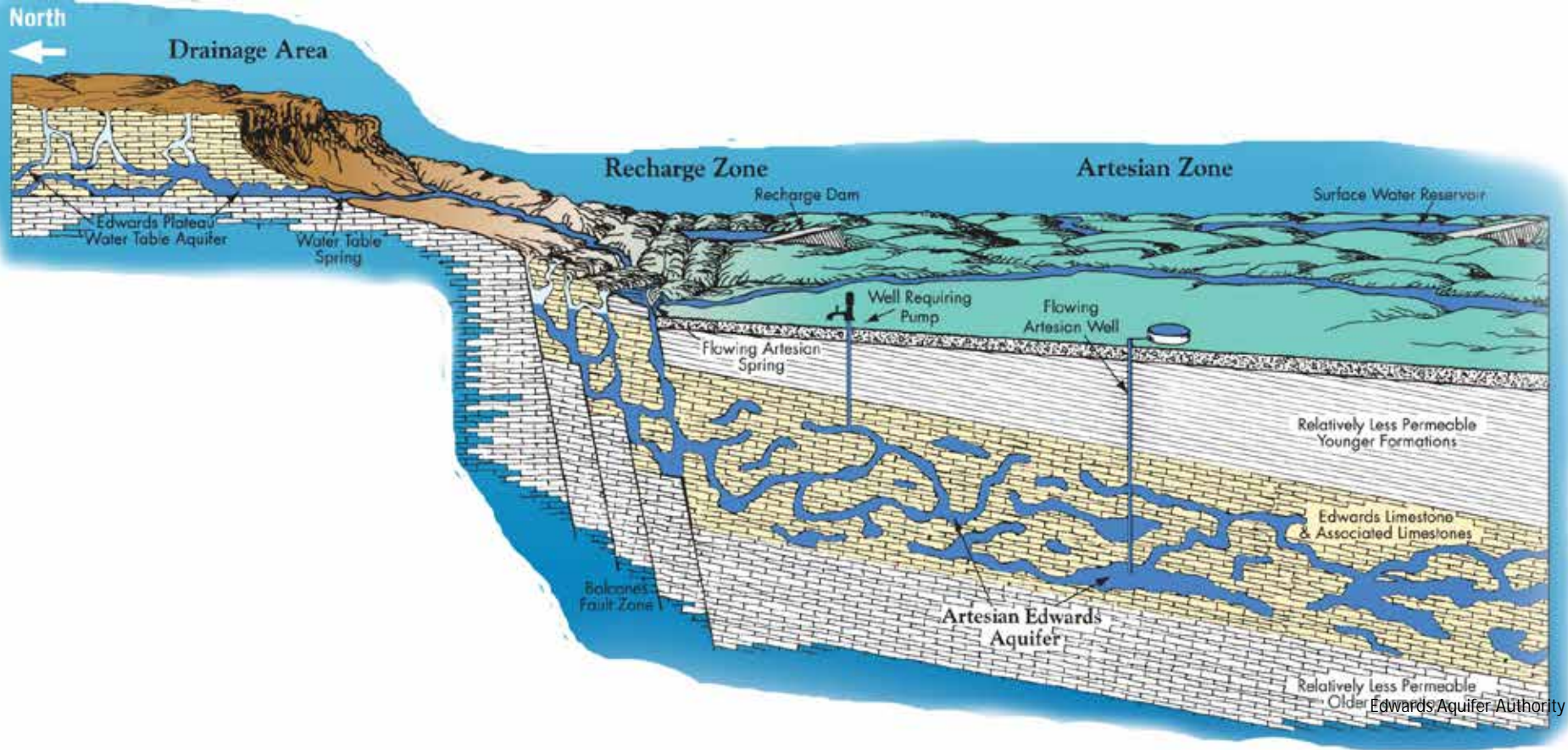




*Seeds of Change:
A Progressive Approach to Sustainable
Urban Stormwater Drainage
Management*

Michelle Villafranca
Fort Worth Nature Center & Refuge

'Dormant Seeds'
(i.e. We've been laying around waiting...)



Fort Worth does not have immediate pressing issues (aquifer, endangered species) to accelerate a climate for more progressive & aggressive change (like Austin/San Antonio).

‘Dormant Seeds’
(i.e. We’ve been laying around waiting...)

Fort Worth is now involved in various landscape-scale projects:



Trinity River Vision



Lake Worth Greenprinting

'Stirring up the Soil'



'Planting the Seed' The Idea

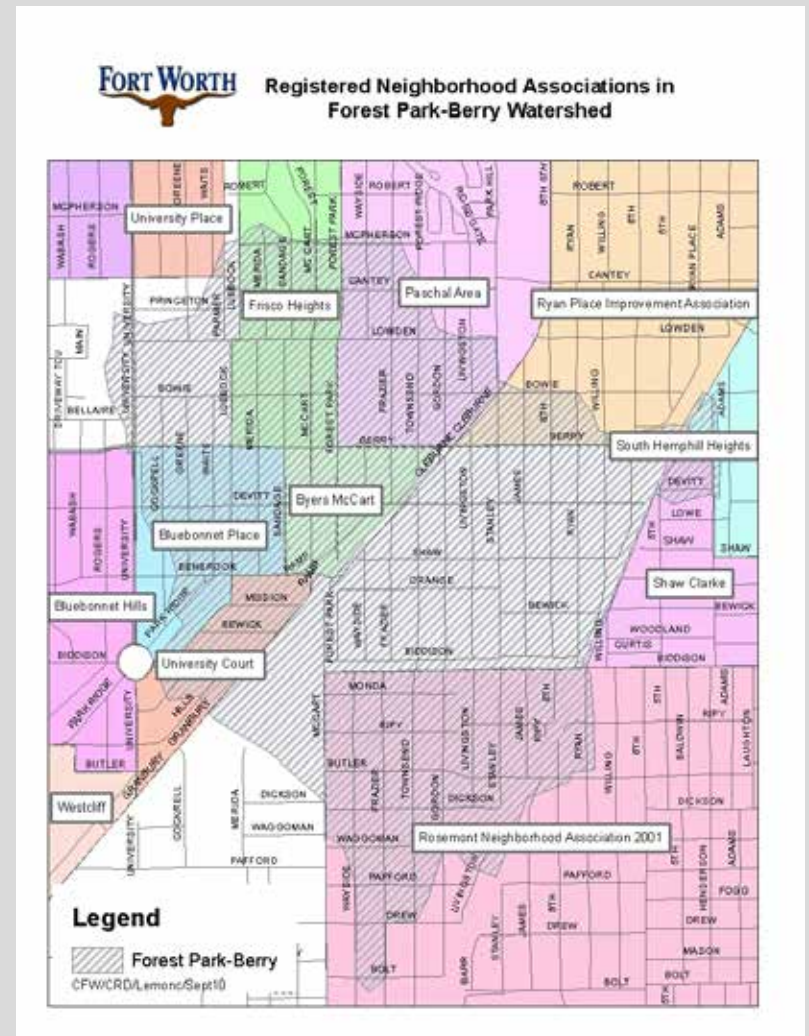
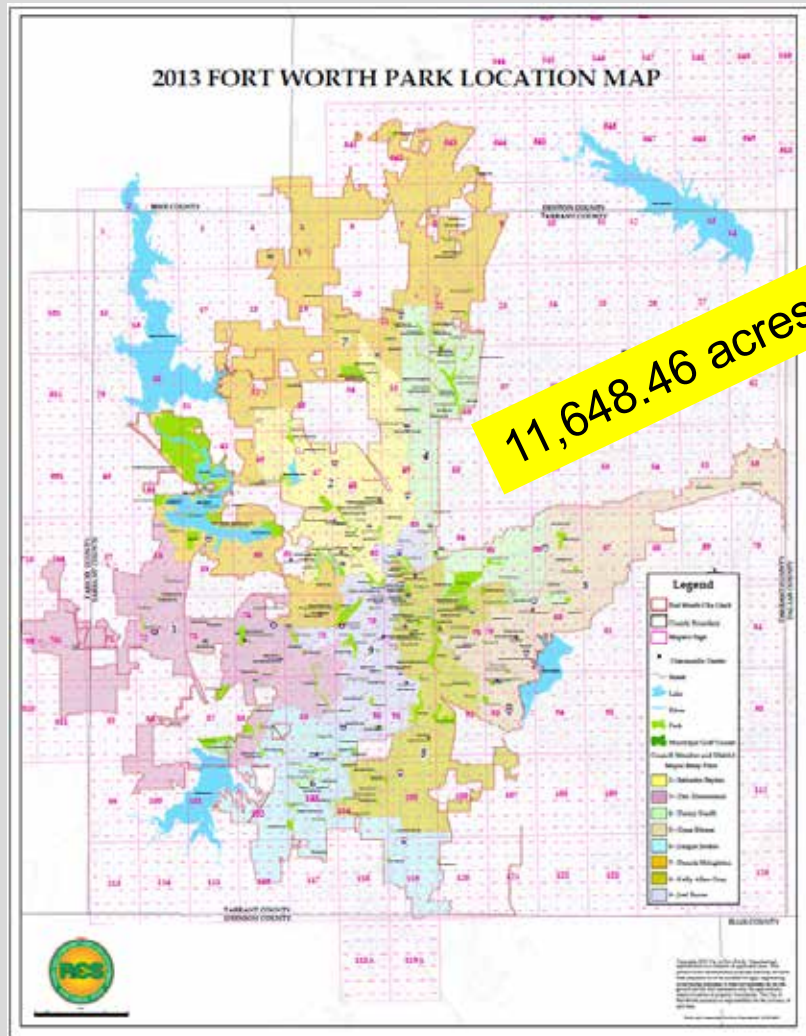


Stormwater Management Division

Introduce native prairie grasses & flowers in select drainage easements following reconstructive maintenance efforts with the goal of reducing future maintenance needs while providing environmental & aesthetic benefits to the community.

'Planting the Seed'

Potential Acreage



Collaboration between two of the major land managers in Fort Worth has important implications for: other channels, watercourses, parks, highways, medians, other public spaces, residential & commercial properties.

'Bad Seeds'

Standard Practices: Seeding

Bermuda Grass \$227/bag
 25#/acre of bermuda
 25#/acre of perennial winter rye
 = \$174/acre

Retardance Class	Cover	Condition
A	Weeping Lovegrass	Excellent stand, tall (average 30")
	Yellow Bluestem Ischaemum	Excellent stand, tall (average 36")
B	Kudzu	Very dense growth, uncut
	Bermuda grass	Good stand, tall (average 12")
	Native grass mixture Little bluestem, bluestem, blue gamma other short and long stem Midwest grasses	Good stand, unmowed
	Weeping lovegrass	Good stand, tall (average 24")
	Laspedeza sericea	Good stand, not woody, tall (average 19")
	Alfalfa	Good stand, uncut (average 11")
	Weeping lovegrass	Good stand, unmowed (average 13")
C	Kudzu	Dense growth, uncut
	Blue gamma	Good stand, uncut (average 13")
	Crabgrass	Fair stand, uncut (10 – 48")
	Bermuda grass	Good stand, mowed (average 6")
	Common lespedeza	Good stand, uncut (average 11")
	Grass-legume mixture: summer (orchard grass redtop, Italian ryegrass, and common lespedeza)	Good stand, uncut (6 – 8")
	Centipede grass	Very dense cover (average 6")
D	Kentucky bluegrass	Good stand, headed (6 – 12")
	Bermuda grass	Good stand, cut to 2.5"
	Common lespedeza	Excellent stand, uncut (average 4.5")
D	Buffalo grass	Good stand, uncut (3 – 6")
	Grass-legume mixture: fall, spring (orchard grass, redtop, Italian ryegrass, and common lespedeza)	Good stand, uncut (4 – 5")
	Lespedeza sericea	After cutting to 2" (very good before cutting)

Standard Practices: Typical Urban Creeks & Stormwater Drainage Channels



Ø Low biodiversity

Ø No healthy connectivity

Ø Low-level biotic systems in place (aquatics, vegetation, invertebrates, etc.)

Ø Heavy on frequent maintenance & fuel consumption

Ø Subject to erosion

Who is involved & what is the mission of each group?

Partners



Who is involved & what is the mission of each group?

Stormwater Management Division



ØProtect life & property from flooding

ØReduce erosion & sedimentation

ØKeep channels & drainages free of obstruction

ØReduce watering to establish cover

ØReduce maintenance time & costs

ØLess wear & tear on equipment

ØImprove water quality

ØSave taxpayer's money

Who is involved & what is the mission of each group?

Fort Worth Nature Center & Refuge

Botanical Research Institute of Texas

Ø Encourage ecologically sustainable practices & promote methods to citizens

Ø Revitalize urban watersheds by returning ecological functions to channels

Ø Repair ecological integrity across urban landscape

Ø Provide/improve wildlife corridor connectivity & habitat improvement

Ø Introduce fire into maintenance regime



Who is involved & what is the mission of each group?

Fort Worth Nature Center & Refuge

Botanical Research Institute of Texas



- Ø Encourage more 'green' practices of less fuel consumption, less water requirements
- Ø Involve community in seeding, out-planting, plant salvage, maintenance, monitoring
- Ø Foster sense of place

Who is involved & what is the mission of each group?

Texas Parks & Wildlife Department

Texas Christian University

ØPromote sustainable projects across the region

ØTrain future environmental leaders

ØProvide monitoring & research opportunities to students

'The Seeds'

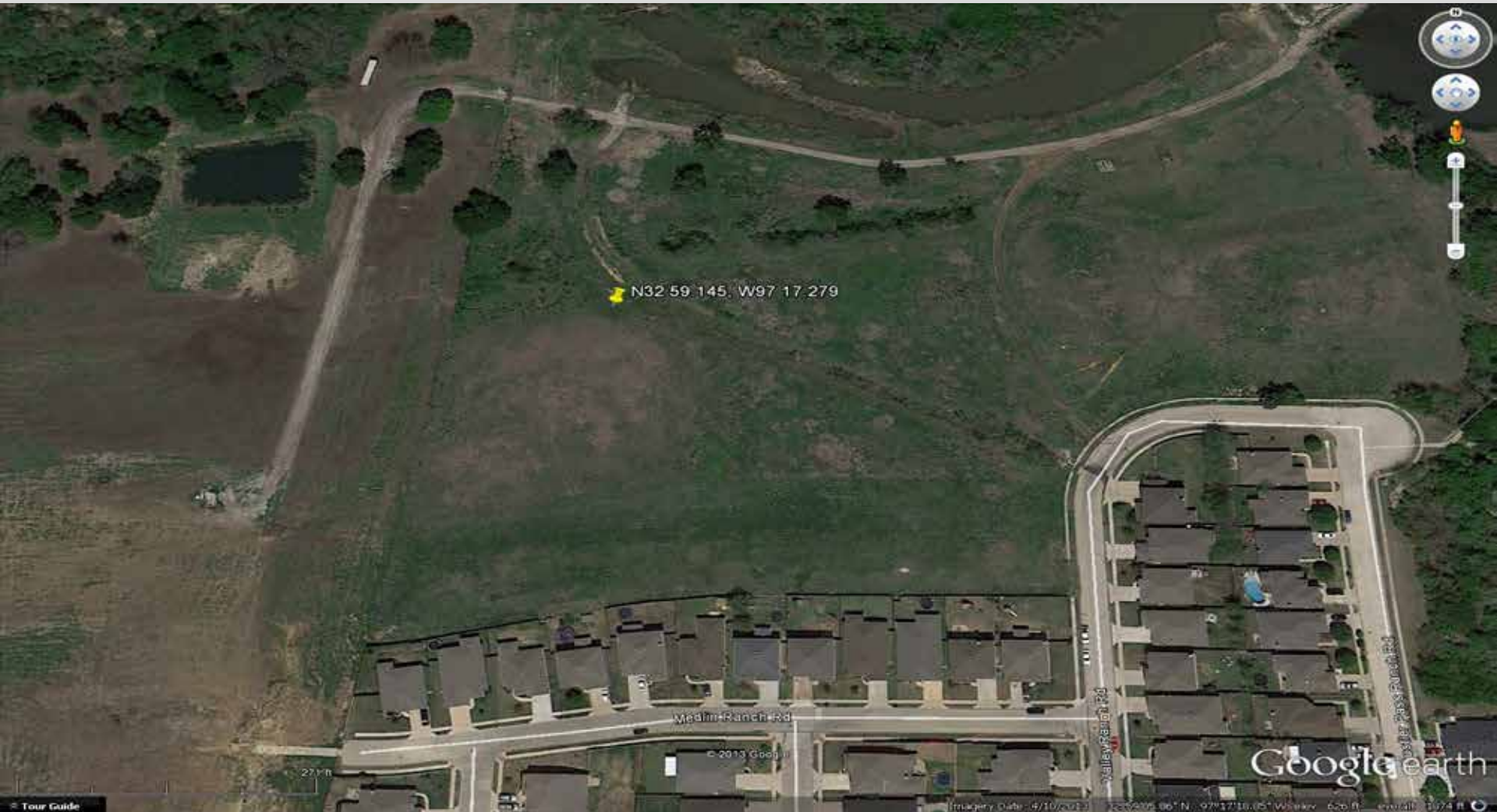
What we planted

Appendix 1: Various Recommended Seed Mix Sockles ("X" indicates present in mix; "XX" indicates present in multiple mixes. Species listed in red generically are less than 2' tall at maturity.)

Species	Seed Mix 1	Seed Mix 2	Seed Mix 3
GRASSES			
Buffalograss	X	X	
Eastern Gamagrass	X	XX	X
Green Sparnlettop	X	X	
Prairie Wildrye	X	X	
Switchgrass	X	XX	X
Little Bluestem	X	XX	X
Blue Grama	X	X	
Sideoats Grama	X	XX	X
Curly Mesquite	X	X	
Indiangrass	X	XX	X
Texas Cupgrass	X	XX	X
Sand Dropseed	X	X	
Sand Lovegrass	X	X	
Bushy Bluestem	X	X	
Big Bluestem	X	XX	X
Cane Bluestem	X	X	
White Tridens	X	X	
Western Wheatgrass	X	X	
Hall's Panicum	X	X	
# of Grasses	19	19	7
WILDFLOWERS (FORBS)			
Texas Bluebonnets	X	X	X
Purple Prairie Clover	X	X	X
Partridge Pea	X	X	X
Texas Yellow Star	X	X	X
Gayfeather	X		
White Prairie Clover	X		
Lemon Mint	X		
Plains Coreopsis	X		
Indian Blanket	X		
Tall Goldenrod	X		
Wooly Croton		X	X
Illinois Bundleflower		X	X
American Basketflower		X	X
Bush Sunflower		X	X
Common Sunflower		X	X
Golden Dalea		X	X
Maximilian Sunflower		X	X
White Prickly Poppy		X	X
# of Wildflowers (Forbs)	10	12	12
TOTAL # SPECIES	29	31	19
SEED COST PER ACRE	\$880	\$624	\$184
Catalog Cereal Rye Cost	\$210	\$210	\$210
Total Projected Cost	\$1090/acre	\$834/acre	\$394/acre

'Watering the Seed'

Pilot Project Site: Medlin Ranch



57' easement (28' to each side of channel), 12' wide bottom, 4:1 slope,
total length = 765'

Goals are to encourage native vegetative cover with low maintenance needs.

'Germinating Seeds'

The Pilot Project: Medlin Ranch



Grading completed by 8/21, seeding by 9/25, germination by 10/23/13.

'Growing' Forward The Future



- Ø Involve Master Naturalists in invasive species control, monitoring, outplanting & education
- Ø Pilot site #2 – John T. White
- Ø The results of this project may be applicable to the developing Trinity River Vision project that will involve riparian restoration.
- Ø Move towards a landscape-scale model

'Growing' Forward The Future



If successful, we move forward to standardization:

- ØPlanting & vegetation management guidelines manual
- ØPlant community descriptions
- ØPlant palette for soil type & elevation (foot, slope, wetland, upland)
- ØChecklist "Process for Project Implementation"

'Growing' Forward The Future

- Ø Move beyond native vegetation to natural channel construction (adding riffles, runs & pools)
- Ø Reconnect people with nature in their neighborhoods
- Ø Increase education & outreach for native plant landscaping
- Ø Foster the development of a network of local native plant nurseries & seed producers





*Seeds of Change:
A Progressive Approach to Sustainable
Urban Stormwater Drainage
Management*

Michelle Villafranca
michelle.villafranca@fortworthtexas.gov
Fort Worth Nature Center & Refuge