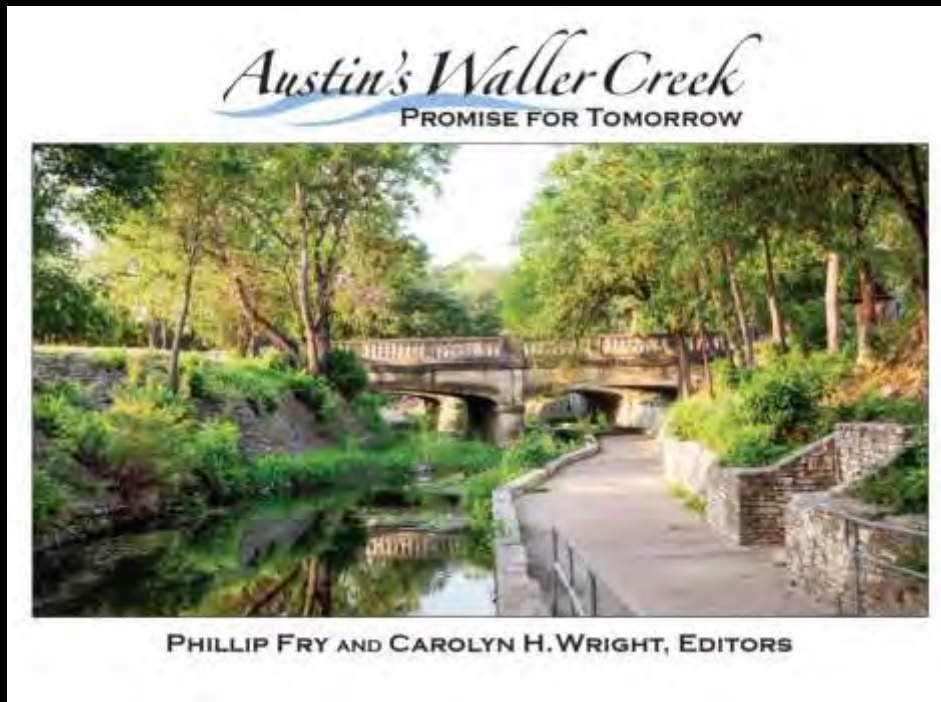
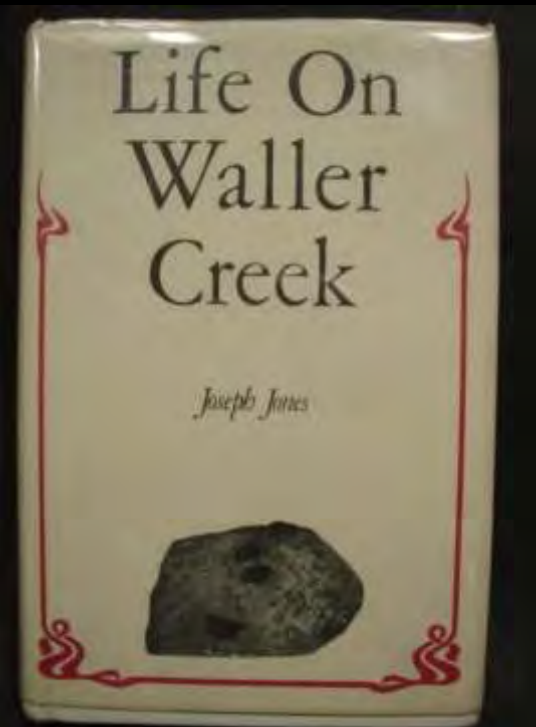




The Urban Stream: Life on Waller Creek

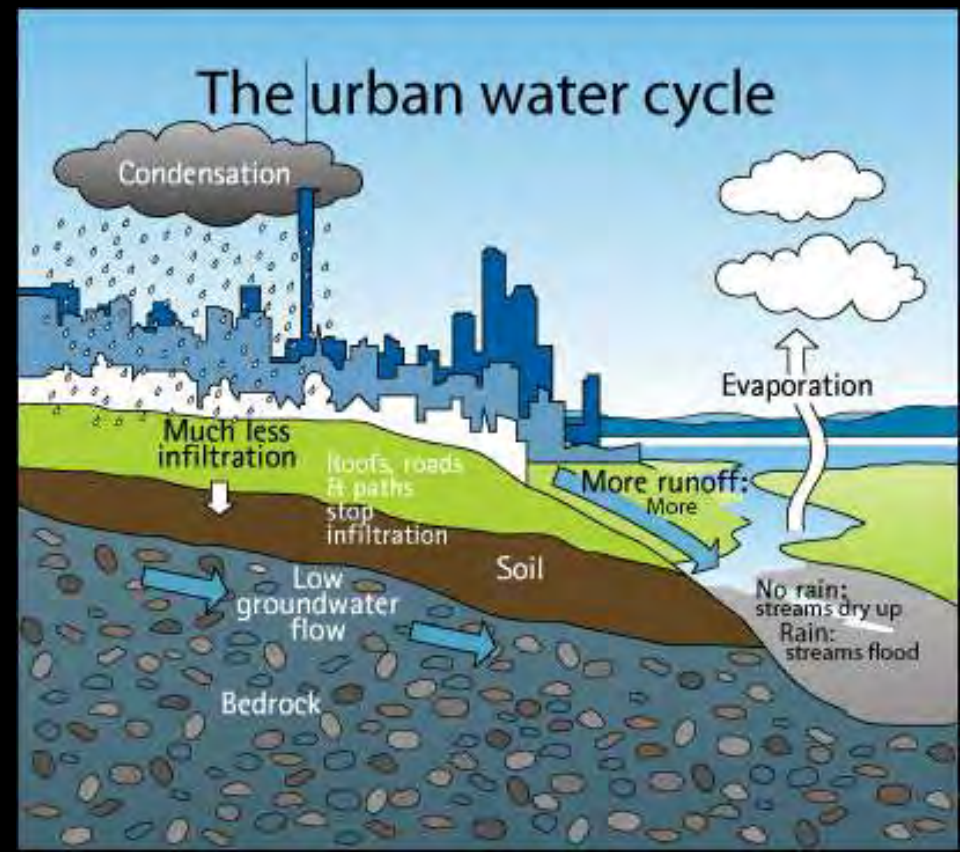
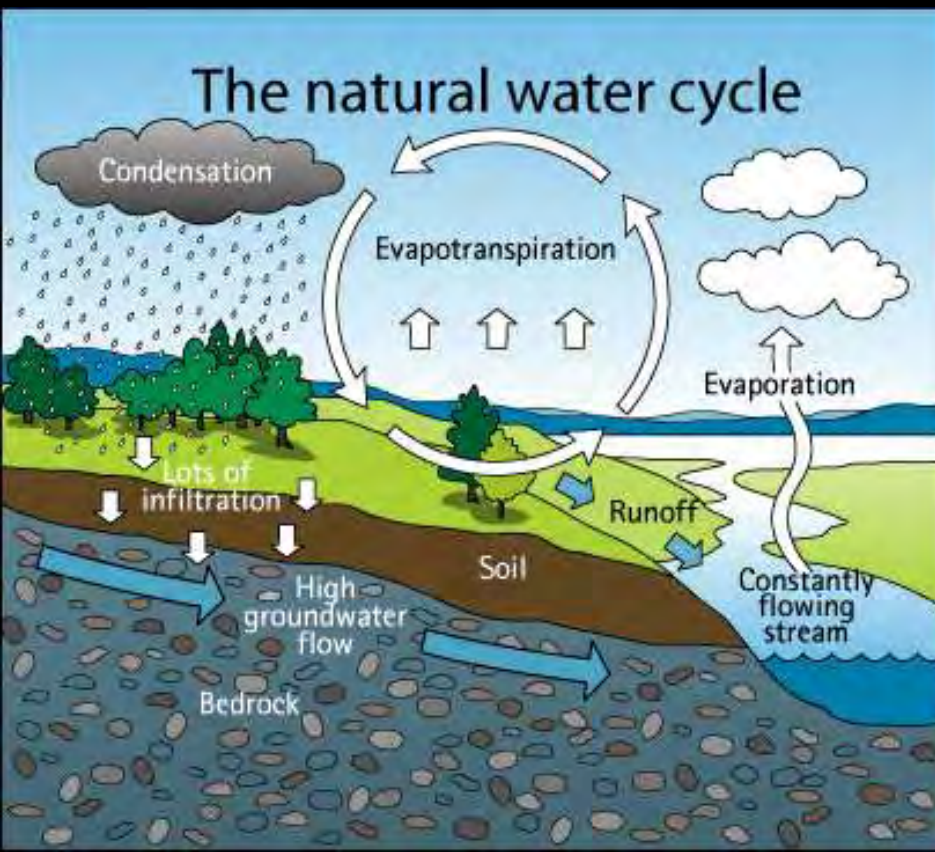
Kevin M. Anderson Ph.D.

Austin Water Center for Environmental Research



The Physical Geography of an Urban Stream

Natural Hydrology vs. Urban Hydrology



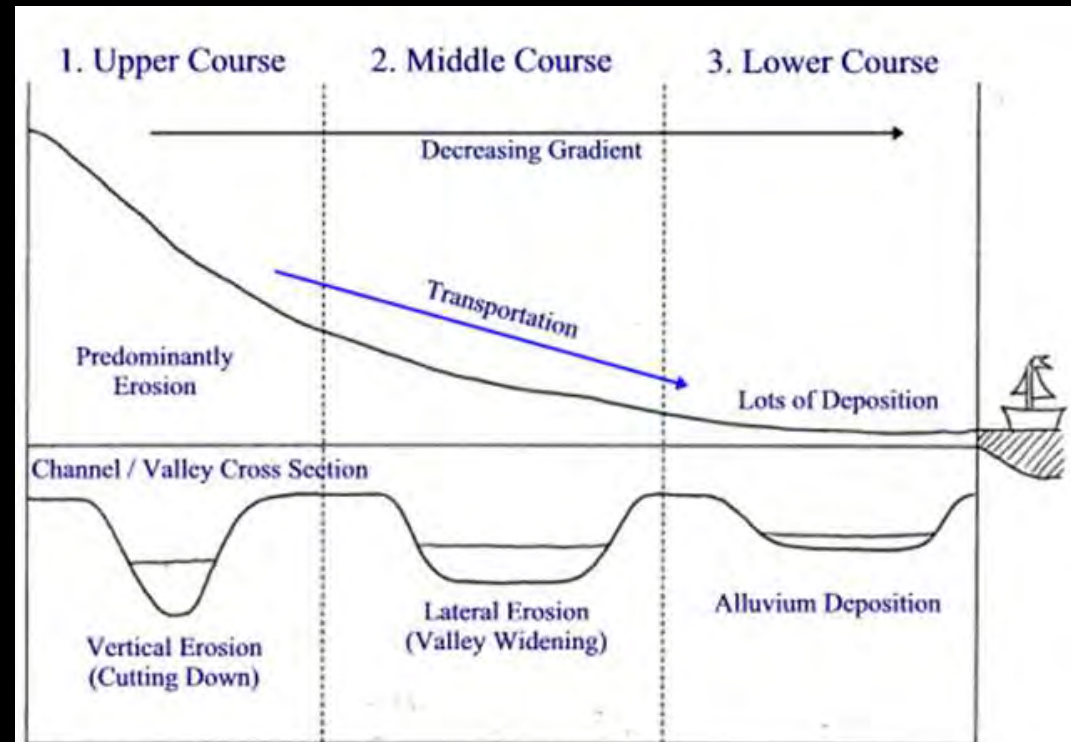
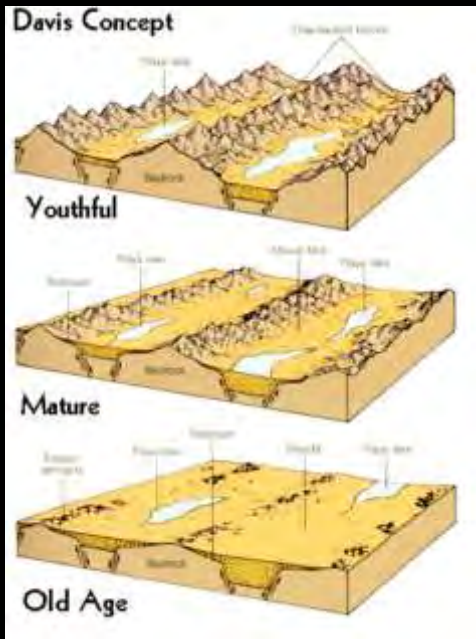
The Life of a (Natural) River – William Morris Davis (1850 - 1934)

Davis “viewed the river system as having a life of its own.

- Its youthful headwaters are steep and rugged. It rushes toward the sea, eroding bed and bank on its way.
- In its central part, it is mature, winding sedately through wide valleys adjusted to its duty of transporting water and sediment.
- Near its mouth it has reached, in its old age, a nearly level plain through which it wanders in a somewhat aimless course toward final extinction as it joins the ocean that had provided the sustaining waters through its whole life span.”


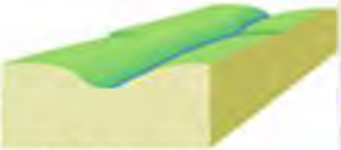
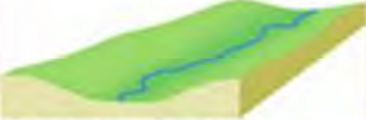



Luna Leopold “A Reverence for Rivers” 1977



The Life of an Urban Creek

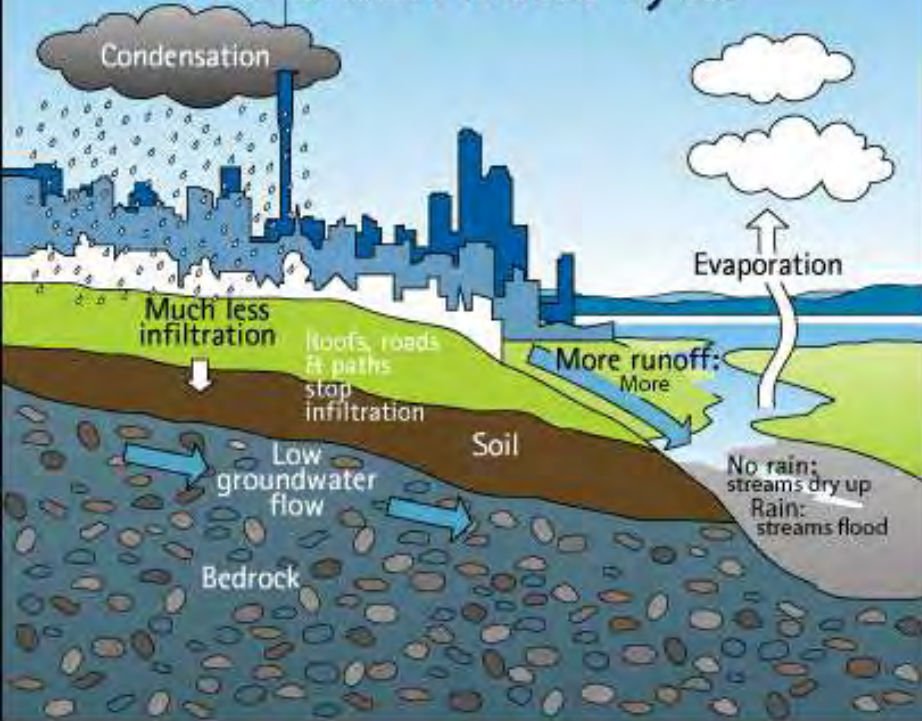
Upper Course, Middle Course, Lower Course

Course Stage	Upper Course Youth Stage	Middle Course Mature Stage	Lower Course Old Age Stage
Slope	<p>Stage</p> <p>Youth (Upper course) Maturity (Middle course) Old age (Lower course)</p> <p>Gradient (or slope) of river flow (long profile)</p>  <p><i>steep slope</i> <i>gentle slope</i> <i>almost flat</i></p>		
Main processes	<p>Hydraulic Action</p> <p>Abrasion</p> <p>Erosion</p>	Erosion and Deposition	Deposition
Valley shape	<p>Valley Shape</p>  <p><i>'V-shaped' valley (narrow floor and steep sides)</i></p>	 <p><i>Valley trough (wide floor and fairly gentle sides)</i></p>	 <p><i>Plain (flat, low land)</i></p>
Main features	<p>V-shaped Valleys</p> <p>Interlocking Spurs</p> <p>Waterfalls</p>	<p>Meanders and Ox-Bow lakes</p>	<p>Deltas</p> <p>Levees</p> <p>Flood Plains</p> <p>(and <u>m+ob</u> lakes)</p>

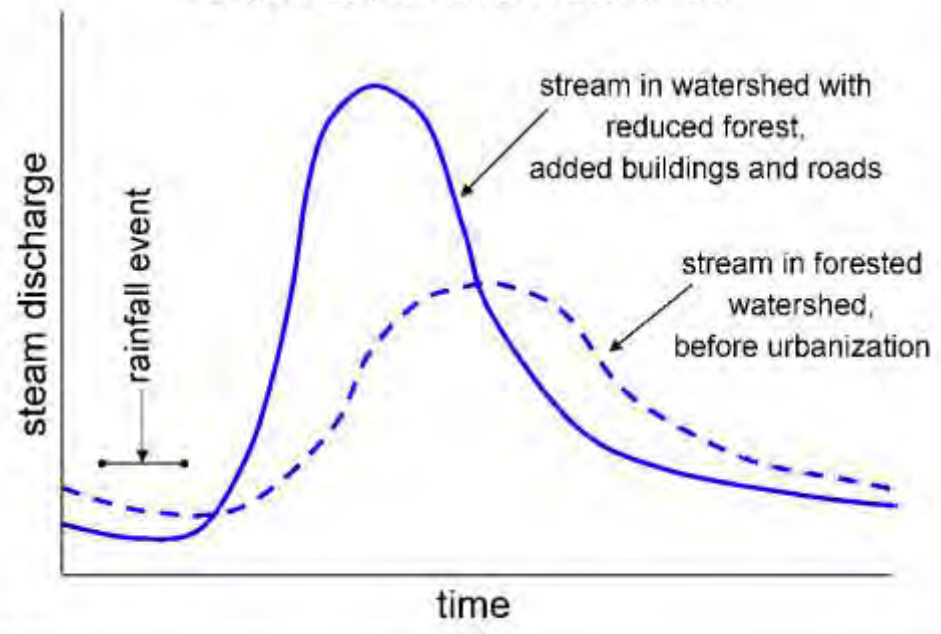
Human Disruption and Urban Creeks



The urban water cycle



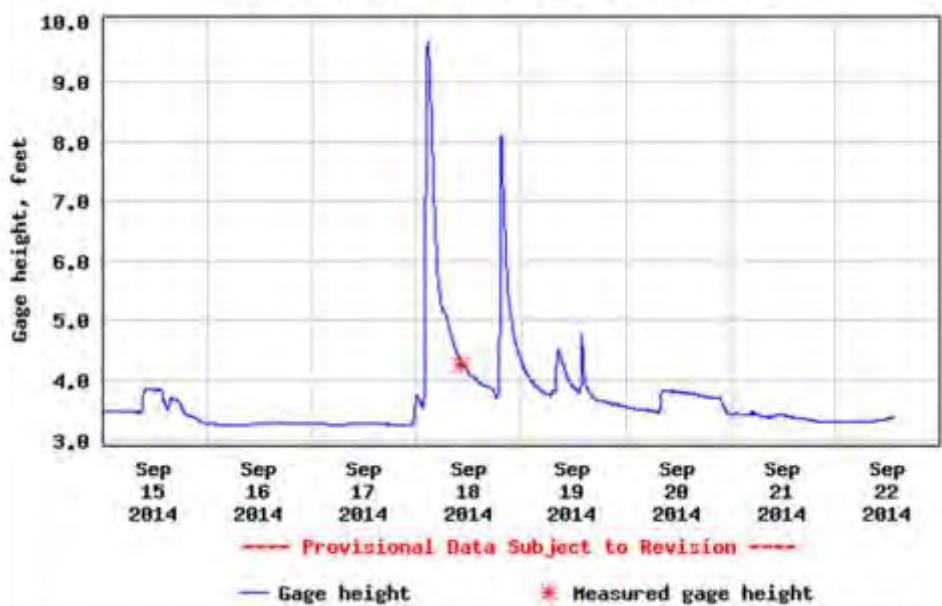
Hydrograph of steam flooding before and after urbanization of a watershed



Urban Hydrology

ATLAS 14
A New Understanding of Flood Risk

USGS 08157560 Waller Ck at E 1st St, Austin, TX



Urban Fluvial Geomorphology

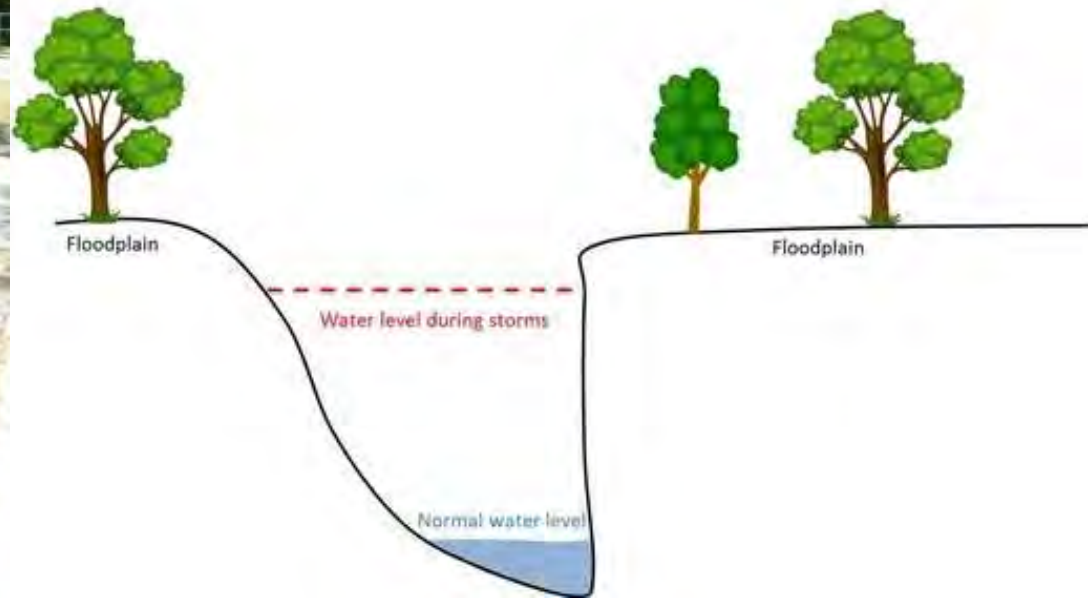
- Urban stream syndrome:
 - High storm flows.
 - Incised channels.
 - Drier riparian zones with lower water tables.



Channel with Incision
Due to Increased Runoff



Urban Stream Channel



Humans as Disruptors – American Urban Ecology

1. Habitats and species

- Usually diverse intermixed greenspaces and built patches cover the area.
- Planted ornamentals, as well as spontaneous colonized species, are widespread.
- Generalist species survive and predominate in urban conditions.

2. Patches and areas

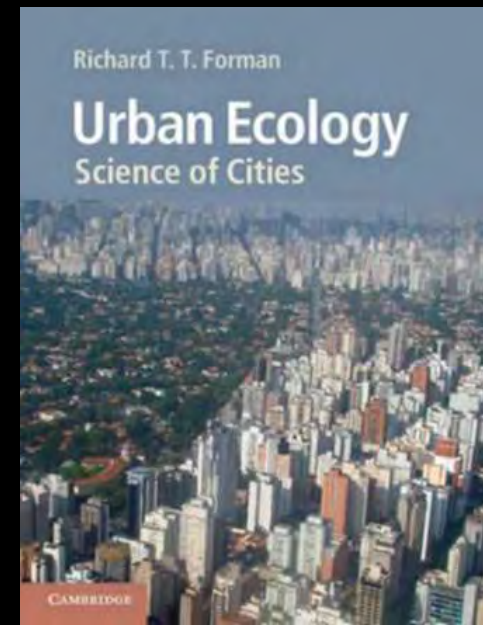
- Housing developments and house plots emphasize rectilinear repetition.
- Boundaries are overwhelmingly straight, abrupt, and in high density.
- Widespread impervious surfaces absorb solar radiation, generate heat, and greatly increase stormwater runoff.

3. Corridors and flows

- Rectilinear road networks channel hordes of moving vehicles and people.
- Underground branching conduits permeate and connect the place.
- Watercourses are channelized and flood-prone areas common.

For a natural landscape or agricultural landscape, these patterns would be bizarre.

In urban areas, they predominate.



Humans as Disruptors - Narrative of Degraded Nature in American (Urban) Ecology

- Perceptions of American Biologists, Ecologists, and Environmentalists
- Ecology “in” cities – “Bizarre” – A weedland community of inappropriate nature compared to pre-urban nature = historical naturalness

“(Urban growth) replaces the native species that are lost with widespread “weedy” nonnative species. This replacement constitutes the process of biotic homogenization that threatens to reduce the biological uniqueness of local ecosystems.”

Michael L. McKinney, “Urbanization, biodiversity, and conservation”. *Bioscience* 52(10), (2002), 883–890.

the human-nature dualism

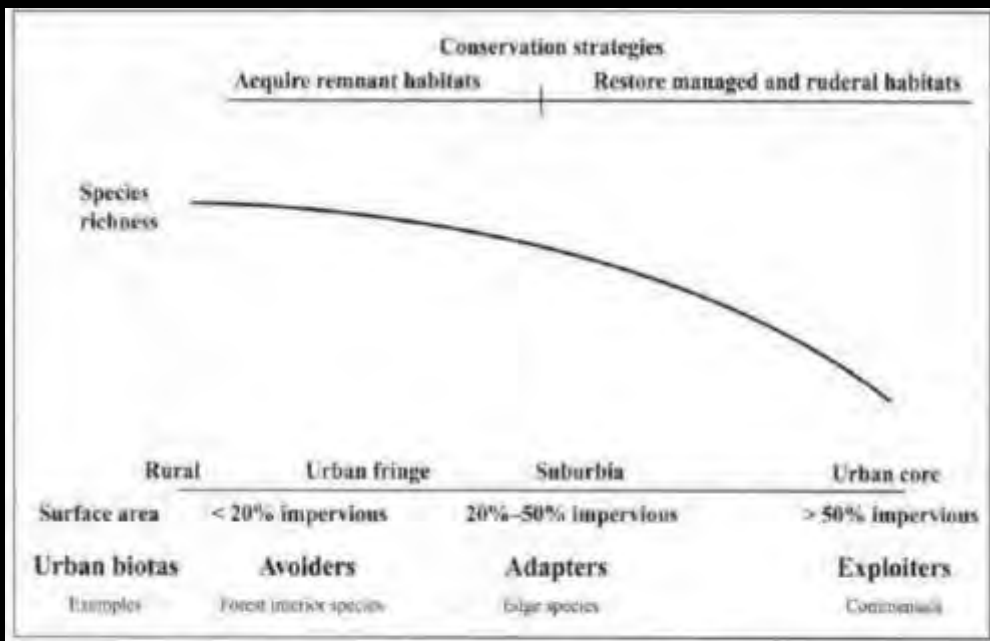
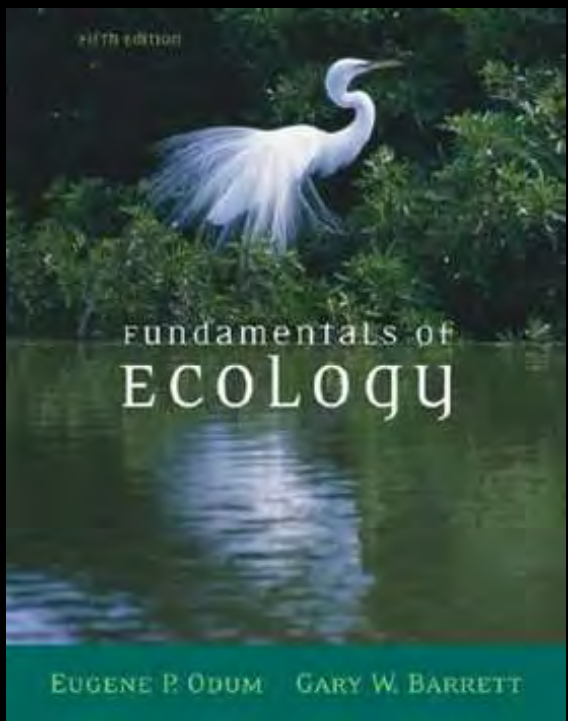
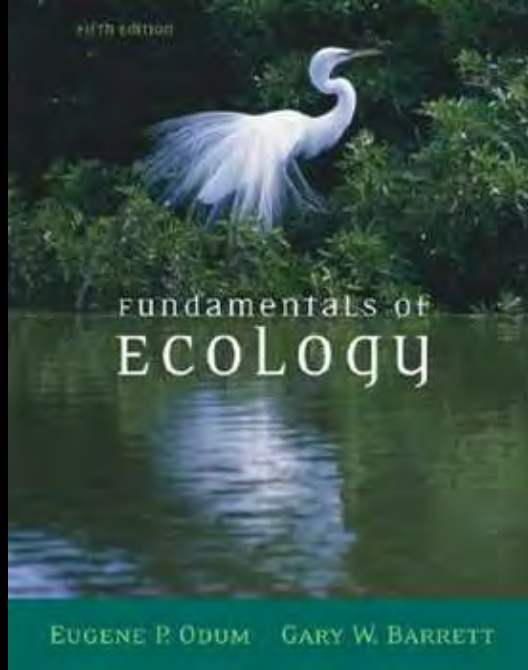
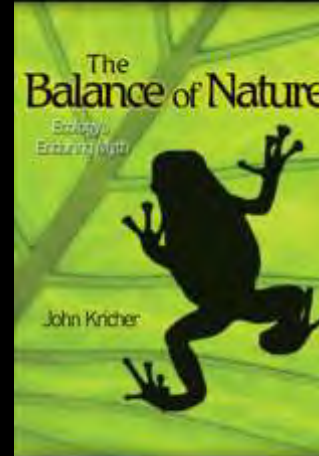


Figure 2. Urban-rural gradient. This is a very generalized and simplified depiction of changes in surface area, species richness, and composition, as compiled from a number of sources discussed in the text. Two basic conservation strategies with respect to urban sprawl are shown at the top.



“Old” Ecology 1864-1960s – Humans the Great Disruptors
“Historical Naturalness”

“New” Ecology 1973 onwards – Discontinuity and Resilience
“Prospective Naturalness”



Don't judge species on their origins

Conservationists should assess organisms on environmental impact rather than on whether they are natives, argue Mark Davis and 18 other ecologists.



The New Ecology

“traditional concept of naturalness oriented toward historical comparisons runs aground.”

Urban Nature and “Established Notions of Nature”

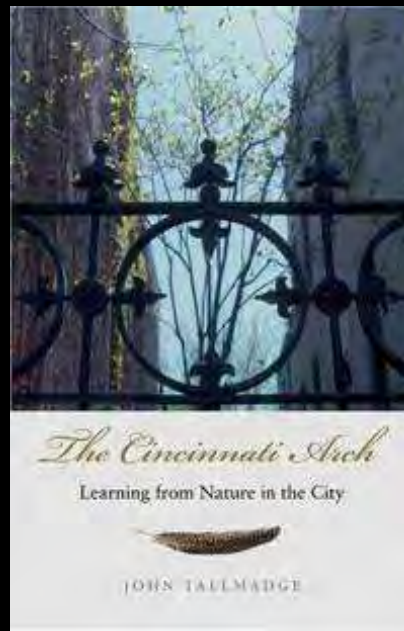
John Tallmadge *The Cincinnati Arch: Learning from Nature in the City* (2004)

Urban nature is not sublime...There’s too much sterility in the form of roofs and pavement, and, oddly enough, there’s also too much wildness, too many weeds and wooded borders and tangled banks, not to mention vacant lots going to brush.

Of course, “wilderness” won’t do to describe such landscapes either. Despite the degree of wildness, there’s too much human impact, too many alien species, too few large animals to meet the legal and cultural criteria.

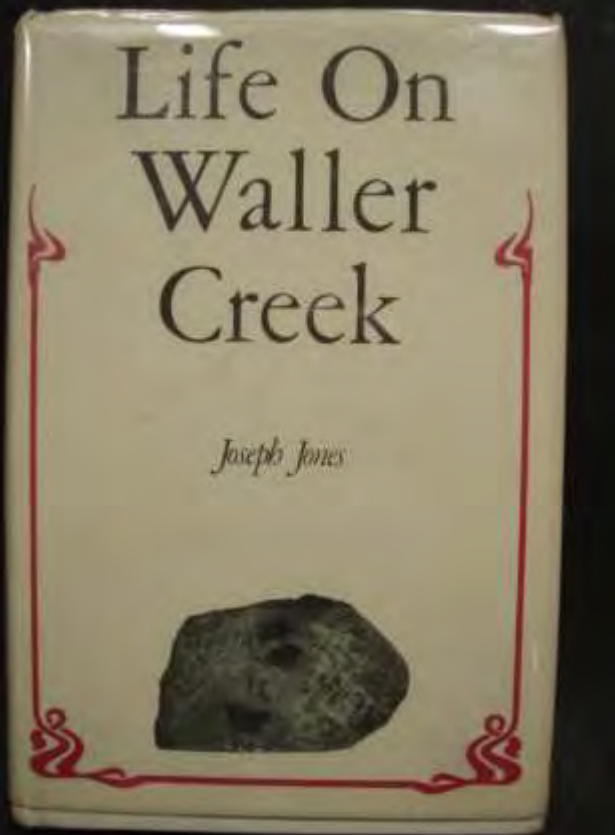
The fact is that urban landscapes are just too mixed up, chaotic, and confused to fit our established notions of beauty and value in nature.

Maybe it’s not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk.



The Meaning of an Urban Stream

Life on Waller Creek and Dr. Joseph Jones





PHILLIP FRY AND CAROLYN H. WRIGHT, EDITORS

AN INVENTORY: JOSEPH JONES AND LIFE ON WALLER CREEK

by Kevin M. Anderson

*There's an old codger down on Waller Creek,
rearranging rocks. What in the world is he trying to do?*

—Joseph Jones, 1982

The odd codger stood midstream in Waller Creek on a hot August morning, a muddy plastic bucket packed with an assortment of tools on a rock at his side. His dark blue cap and rubber boots were also marked by creek mud. He was too focused on his work to notice me settle in the shade beneath the bridge. He was building a small dam of stones to redirect the meager current of the creek into a pool of water on a limestone ledge. This diversion would create a small waterfall once the pool filled. As I watched him so absorbed in his creek-work, I recognized a kindred spirit, another creek muddler given to rearranging rocks and flows, and I silently admired the fun he was having. The old codger voiced his approval as the water pooled and spilled over the limestone, and he smiled, first at the splashing water and then at me. It would be over ten years later that I read his book and realized I had met Professor Joseph Jones on that hot August day at Waller Creek. By then, Joe was dead, and I was left to get to know him through his daughters and his other extraordinary work, *Life on Waller Creek: A Palaver about History as Pure and Applied Education*.

*Forty years and more I have packed my lunch to
Waller Creek. Only since retirement, though, have I felt I*

*had time to spend undertaking small improvements along
its rugged banks: ephemeral gestures to be sure, but good
for body and spirit alike — an hour or so, three or four
days a week, before lunch. Instead of going up the wall I
go down to the Creek.*

—Joseph Jones

In this unassuming way, Joe begins his account of the life history of Waller Creek and his own long engagement with the creek. Professor Jones began teaching at the University of Texas in 1935, and each day he would walk down to the creek from his office in the English Department to eat his lunch and to put the stress of university life in perspective. Like Thoreau, whose writing Joe studied and loved, he kept a journal of his creek musings and observations. Waller Creek was Joe's Walden Pond, a place known intimately over a lifetime, and, like Thoreau, he argued for the value of preserving wildness, finding it even in a long settled place.

But, unlike Saint Henry and subsequent nature writers, Joe writes with a rare openness to the ruinous attractions of the urban detritus found in the creek. He clearly loves the creek as a site for nature encounter and for reflection, but he deliberately undermines the seriousness of the conventions of nature literature by including humans and our environmental impacts as more than just something to be lamented. The degrading artifacts of humankind that so



Kevin M. Anderson

*(Left) Jones particularly loved
this section of Waller Creek
that flows under the 2nd
Street bridge on the UT
campus.*

“There’s an old codger down on Waller Creek, rearranging rocks. What in the world is he trying to do?”
(Jones, Preface *Life on Waller Creek*)

The old codger stood midstream in Waller Creek on a hot August morning, a muddy plastic bucket packed with an assortment of tools on a rock at his side. His dark blue cap and rubber boots were also marked by creek mud.

He was too focused on his work to notice me settle in the shade beneath the bridge.

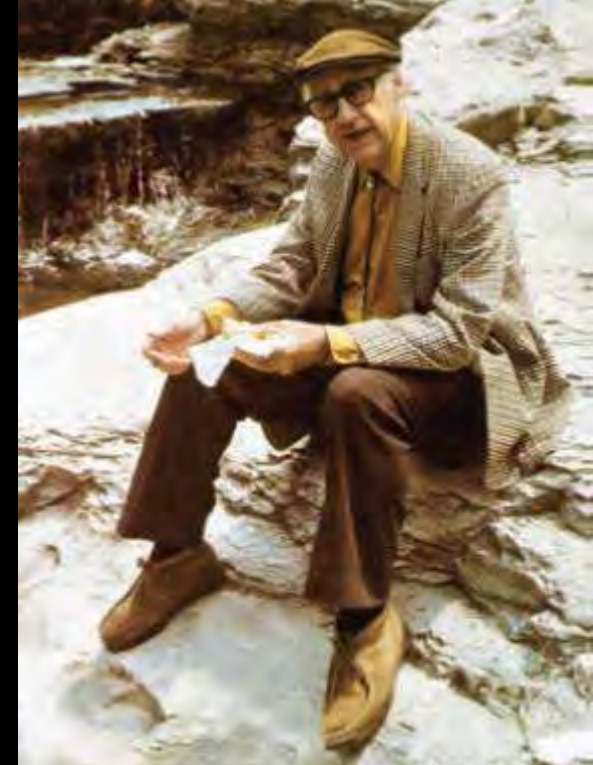
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(Anderson, *Austin’s Waller Creek*)

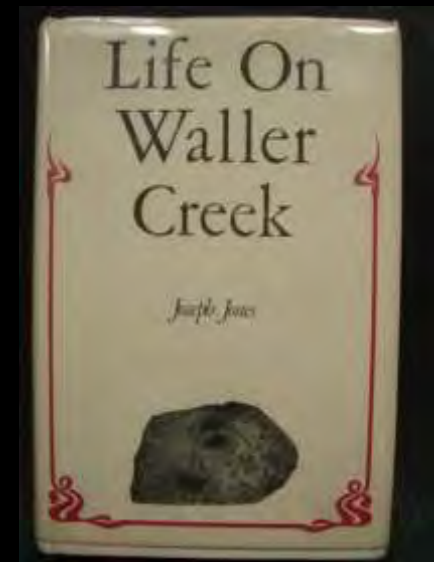


Joseph Jay Jones, UT professor of English for 40 years, died on February 12, 1999, at age 90.

- He was born in Peru, Nebraska, on June 29, 1908, and attended public schools in Tecumseh, Nebraska. After three years at Nebraska State College in Peru (1926-1929), he transferred to the University of Nebraska and graduated in 1930.
- He then attended Stanford University, where he received his MA in 1931 and his PhD in 1934. After teaching at Colorado State College in 1934-1935, Jones began his 40 years at UT.
- He was specialist in American transcendentalism and the neglected literature written in English outside England and America, and he worked to advance the study of the literature and culture of Australia, New Zealand, the Union of South Africa, Canada, and other countries in which literature in English was prominent.
- Jones appeared in Richard Linklater's film, *Slacker*, where his screen presence has been described as striking because of, paradoxically but characteristically, his complete naturalness.



Joseph Jones
1908-1999



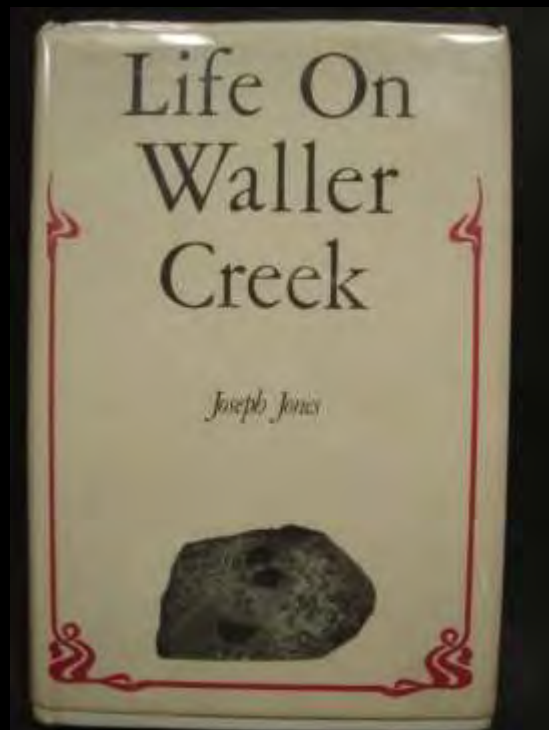
Life on Waller Creek: A Palaver about History as Pure and Applied Education

(1982)

palaver *n.*

- a conference or discussion
- talk; esp., idle chatter
- flattery; cajolery

“Henry Thoreau found that “incessant labor with the hands, which engrosses the attention also, [was] the best method to remove palaver out of one’s style,” but for me – to judge from my title page – hand labor may have conspired to put the palaver *in*.”



“Forty years and more I have packed my lunch to Waller Creek.

Only since retirement, though, have I felt I had time to spend undertaking small improvements along its rugged banks: ephemeral gestures to be sure, but good for body and spirit alike – an hour or so, three or four days a week, before lunch.

Instead of going up the wall I go down to the Creek.”



Constructive Meddling

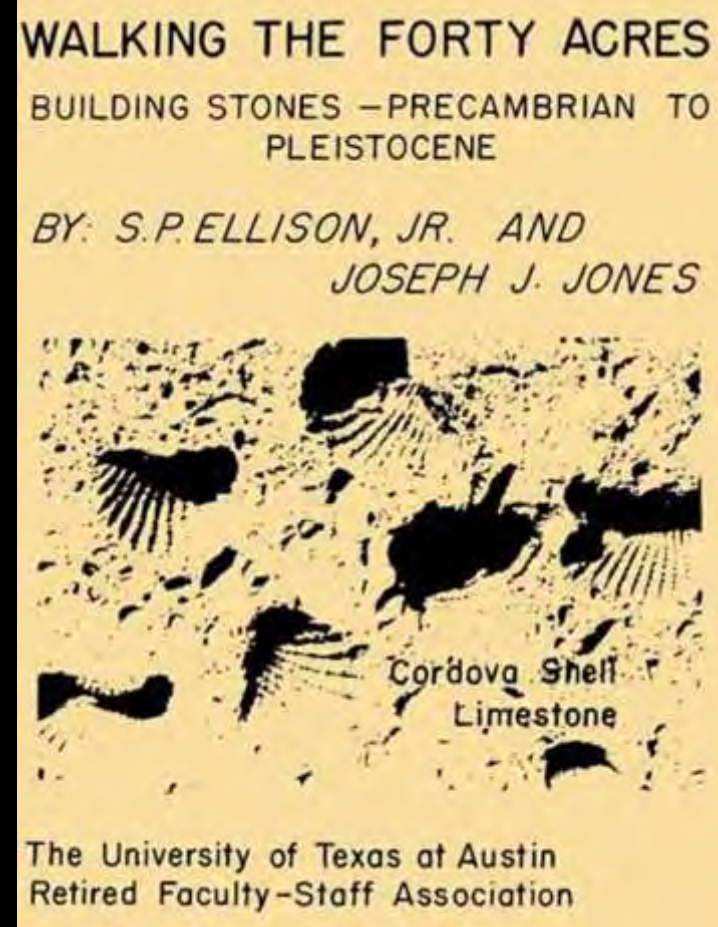
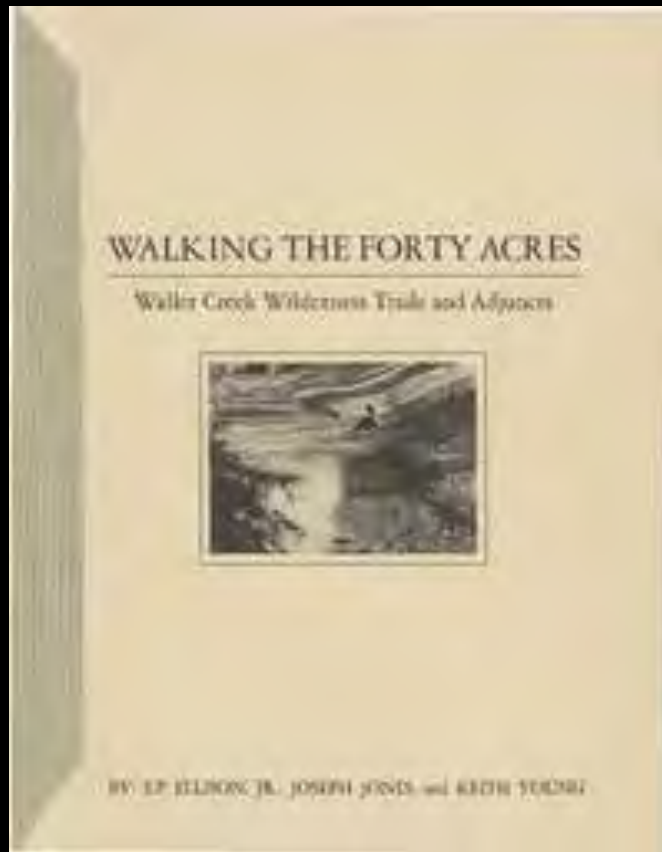
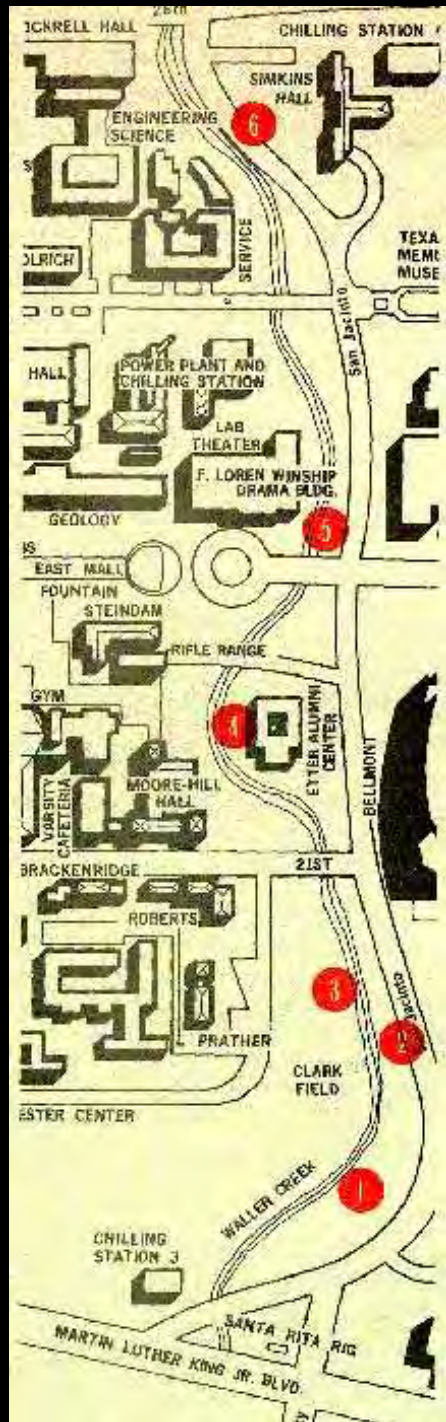
“I don’t wear a ten-gallon hat, but I do lug along in a five-gallon green plastic bucket the rest of my tools: machete, (or corn knife, as I knew it in corn country), light sledgehammer, pruning shears, homemade hand pick (patterned after the Polynesian digging stick, which was made from forking tree-branches), and – occasionally – pruning saw and bobbed-off broom-rake.”



Waller Creek Wilderness Trails and Adjuncts

By: S.P. Ellison, Jr., Joseph Jones, and Keith Young

Prepared for Members of the
University of Texas at Austin Retired Faculty-Staff Association
May 10, 1983



“To explore Waller Creek and environs is to live intensively in the modern world and at the same time to be aware of how brief an instant modernity has been with us; how brief an instant, indeed, the human presence has been here in any guise to contemplate a very old set of surroundings...”



“Inventory” – The Meaning of an Urban Creek

“If what has been tagged “Inventory” – appearing sporadically at numerous places throughout the rest of this book – strikes the reader as contemporary intrusion into the concerns of the past, so be it. The past intrudes on us; why shouldn’t we exercise our right of reciprocity?

But I hope it may suggest more than intrusion, a feeling of continuity outside either past or present, strictly viewed...

In italic passages, then, the casual, the accidental, the wayward all have a little more scope than straight narrative will stoop to tolerate.”



“The heavy-handed harvesters have been through the Creek bed again, leaving a havoc of twigs and chips and broken weeds and – well, that skinned look, which nature will soon heal over...”

an orange plastic football, souvenir size, one of the kind seen on the tops of car aerials...

The most intriguing object I dug up with my short-handled shovel was a molded red-plastic ring about 4 ½ inches in diameter and a bit less than an inch thick. It is continuous but not solid...”



“Cretaceous Limestone Gutter” (Humanized Landscape)

“I would hope also that the reader, if he should tire of being reminded overmuch of what an efficient trash-receiver (up to a point) the Creek has become in our day, will exercise the reader’s privilege of imagining what counterparts to an inventory of the 1970s-80s were almost certainly to be found in Waller Creek pretty steadily after 1839 and indeed even before.

But let him first accept himself as part of the continuum and become his own short-term archeologist: such fugitive creek-things as I will be cataloguing here, when carried and buried, might be thought of as archeology going somewhere to happen.

Thus, for example:

Plastic beer cups (Brand X with blue map of Texas) in addition to the ever-ongoing deposit of beer cans...

A grackle’s reflection as he flies low over a still pool...

After a flood, young willows keep reminding us, for many days, “It went that-a-way,”...

High-visibility translucent bluish plastic bags – like Portuguese-men-of-war on a Gulf beach, but not biodegradable...

scars of the sewer builders, still evident after twenty, twenty-five years...A much-twisted-and-battered yellow umbrella.”



"A closer-mechanism for a metal casement window (not in operating order)..."

The name "Billy" neatly scratched with a stick through the algae onto the Creek bottom...A sky-blue tin lid, decorated with gold trim and other fancywork: American Louis XIV...

Roots projecting straight out from between strata at the base of a cliff, groping for water: what trunk do they feed, at what distance?...

The patriarchal pecan tree on the west bank a few rods south of the Drama Building, called "Old Geronimo" has seen not only the days of Geronimo himself but probably everybody and everything else in Texas history, and much more. Now slowly dying back, what a life it has had!

...A rusty bucket-bottom caught through one of its holes on a ragweed stub, two feet up

...Dandelions and some other yellow flowers are out on sunny days in early January

...I'm almost as glad to see readers on the Creek bank as I am to see longear sunfish in the pools

...A pink plastic spoon."



"A yellow candy-wrapper..."

Plastic bottle for duplicator ink...

Half a cement block...

and from masses of radiant leaves the grackles, no longer wheezing out half-whistles, would carol hymns of glory to God...

A largish sheet-metal cylinder, very rusty...

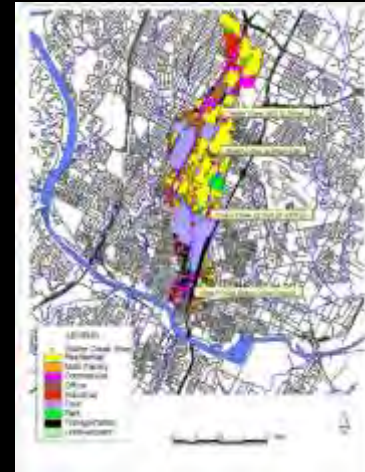
Cypress needles help traction, too, on a slippery bank."



The Urbanization of Waller Creek Cultural Geography

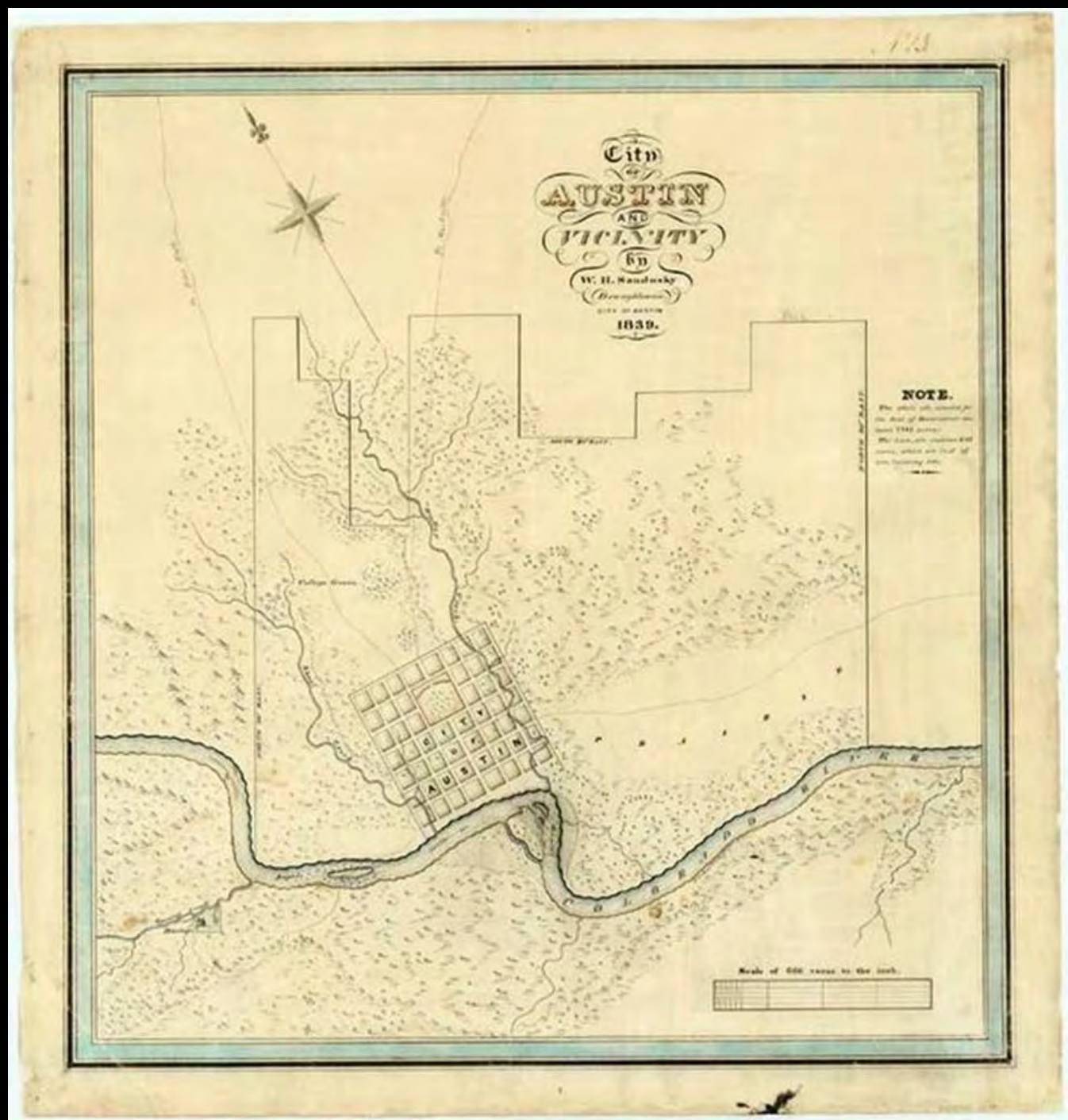


Waller Creek
Conservancy

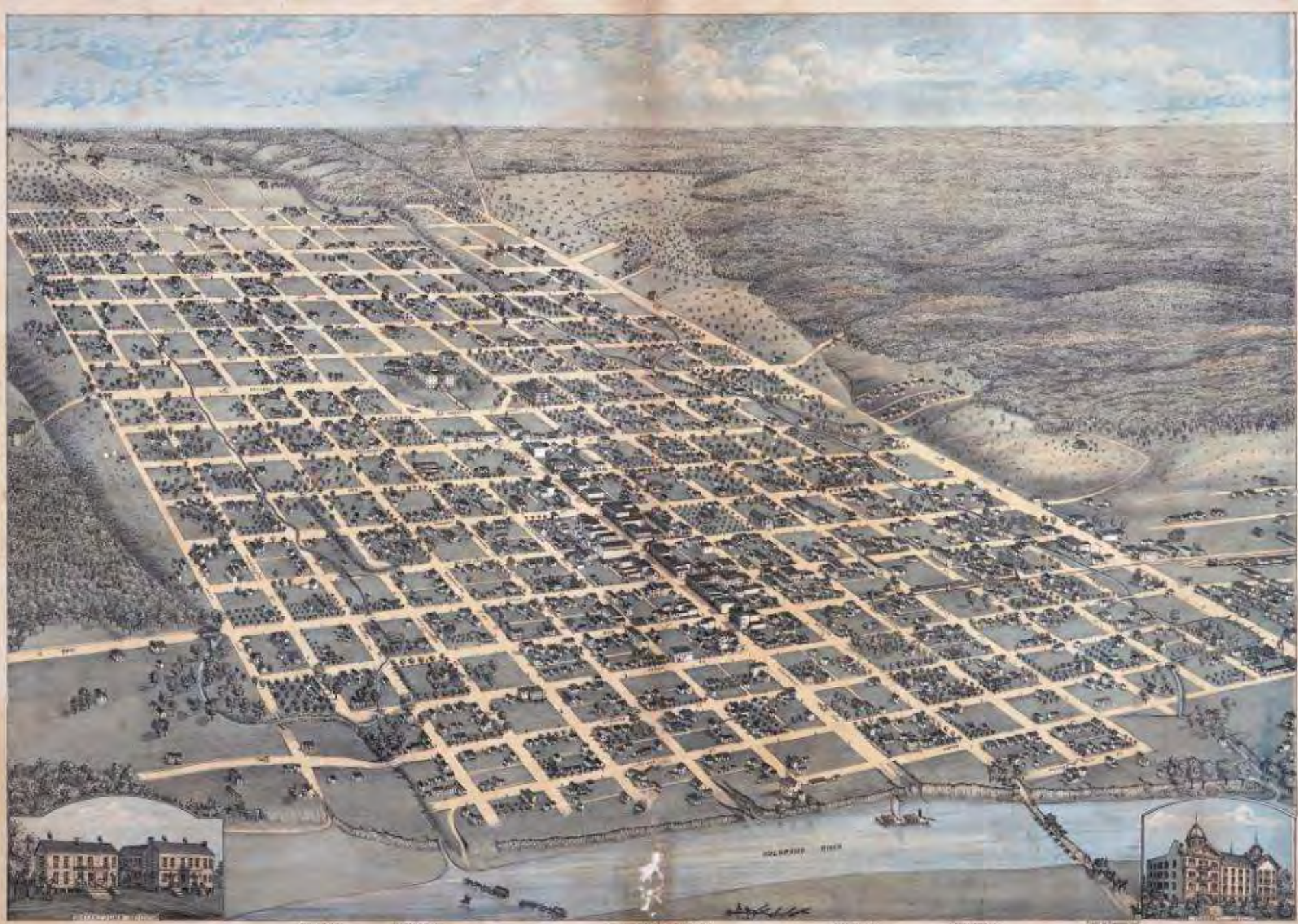


Urbanizing Waller Creek

Austin 1839







- REFERENCES
- State School
 - County Jail Office
 - Commercial Club
 - Public Square
 - Central Market
 - City Hall

- REFERENCES
- City Art & Market Hall
 - State Ins. Co. Building
 - Bank
 - Office
 - Post Office
 - Fire Station
 - City Jail

BRIDGE VIEW OF THE CITY OF

AUSTIN

TRAVIS COUNTY TEXAS.

- REFERENCES
- Episcopal
 - Methodist
 - Catholic
 - Baptist Church
 - Presbyterian
 - Synagogue

- REFERENCES
- Hotel Hamilton
 - Hotel Hamilton
 - Commercial Club
 - City Hall
 - U.S. Arsenal

1890

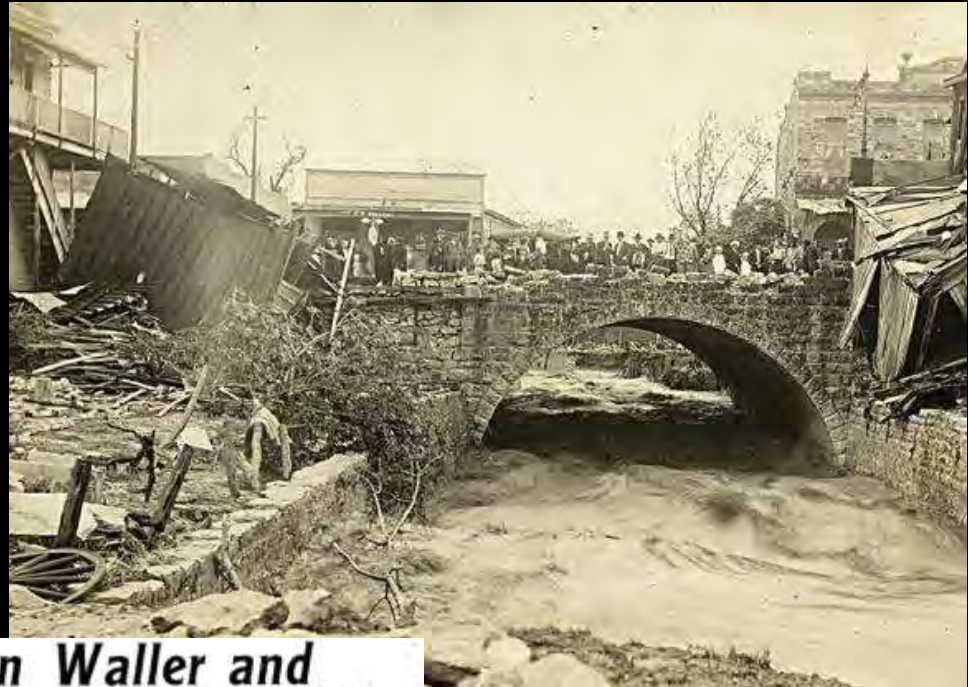


PANORAMIC VIEW OF
AUSTIN, TEXAS.
THE CITY OF AUSTIN, TEXAS, WAS FOUNDED IN 1822.
THE CITY WAS INCORPORATED IN 1856.
AUSTIN IS THE CAPITAL OF TEXAS AND IS ONE OF THE
LARGEST CITIES IN THE STATE. IT IS THE SEAT OF
THE UNIVERSITY OF TEXAS AND IS A CENTER OF
COMMERCE AND INDUSTRY.
THE CITY IS BUILT ON A HILL AND IS SURROUNDED
BY A RIVER. THE CITY IS ONE OF THE MOST
BEAUTIFUL CITIES IN THE STATE.

1915 Flood



PICA 14517, Austin History Center, Austin Public Library



Flood Sweeps Down Waller and Shoal Creeks With Heavy Loss of Life and a Big Property Damage

Life and property were taken unmercifully as the toll of the waters that swept down Waller creek and through the streets of that vicinity on the east side last night.

The list of those who were drowned, according to all knowledge gained last night, includes:

Mrs. C. S. Esell, 701 East Seventh street; Elbert Edwin Eselle, nine years old, 701 East Seventh street; Martha Virginia Eselle, five years old, 701 East Seventh street; Harvey King, twenty years old, employe of William P. Carmichael Company at Austin Dam, 701 East Seventh street; Helen King, sister of Harvey King, 701 East Seventh street; Mr. and Mrs. King, parents of Harvey King, 701 East Seventh street; Minnie Clinton, negro, in rear 416 East avenue; Negro man and woman in house on Waller creek bank between Tenth and Eleventh streets; three negro children named Chambers, four, ten and twelve years old, the two older being boys. Bodies were recovered at Nineteenth and Trinity streets.

It was impossible to estimate the damage to property. Reports were that the bridge across Waller creek at Nineteenth street was swept away. The concrete balustrade on the bridge across Waller street between Sabine street and East avenue was swept away by houses that were hurled downstream by the raging waters of the creek. The H. & T. C. bridge at Fourth street was swept away for the most part and was entirely wrecked.

From along the banks of Waller creek small houses were caught in the rising, boiling waters and carried down stream to pile up against the bridge on East Sixth street between Sabine street and East avenue. The stables of the city just above the bridge on East Sixth street were washed away and wagons were carried as far as Sixth street where they were piled and jammed in a pile of wreckage. Houses below Sixth street were washed away. It was impossible to learn just how many because of the complete darkness of the city as the result of wire confusion and the absence consequently of any electrical lights.

Six houses occupied by negroes and located on Sabine street were gathered into the mass of the hungry waters and swept down stream. Nearly every house on the bank of Waller creek was either flooded or moved by the waters.

A big pile of wreckage now marks the site of East Sixth street where the combination store and house of I. Joseph stood. Lying on the north side of the East Sixth street bridge across Waller street is a towering pile of timbers, what is left of the residences along the Waller creek banks near the Sixth street bridge.

Business houses on East Sixth street in the near vicinity of the Waller creek bridge were flooded with water. The waters unseated houses scattered throughout the East avenue district and to the north of East Sixth street in the vicinity of the Waller creek, and toppled them over to be carried down the breast of the stream.

The approach to the Congress avenue bridge on the south side was washed away completely and connections with South Austin were broken. The I. & G. N. railroad bridge embankment south of the river was washed away and the tracks have slipped down, all out of use and useless for service.

A pitiful, heartsteekening pandemonium reigned on the east side all along the vicinity of Waller creek, particularly just to the north and south of the Sixth street bridge.

In 1938, Lyndon Baines Johnson visited the creek and
“decried ‘the shanties’ and ‘hot beds of crime.’”

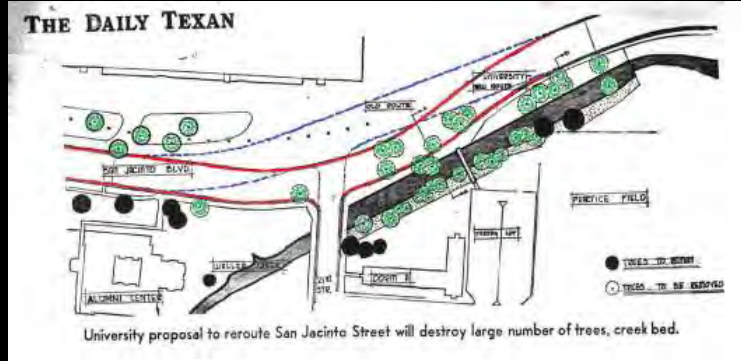


C03659, Austin History Center, Austin Public Library

The Battle of Waller Creek 1969

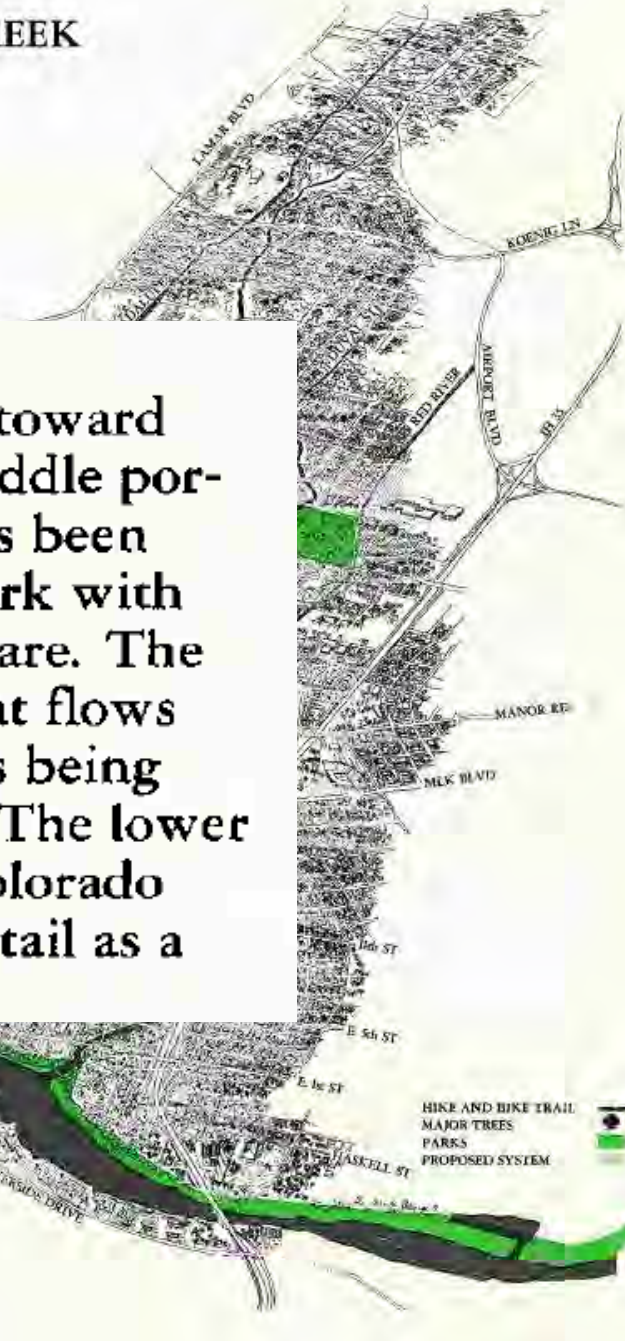
Protesting the destruction of trees and mutilation of the creekbed along San Jacinto Boulevard south of 21st Street.

The Battle of Waller Creek was touched off when the UT board of regents decided to bulldoze several hundred feet of Waller Creek to expand Memorial Stadium. In an unsuccessful attempt to stop the bulldozing, student protesters chained themselves to trees; the chancellor of the board of regents, Frank Erwin, complete with hard hat and bullhorn, personally oversaw their arrests.





WALLER CREEK



WALLER CREEK:

Waller Creek is rapidly moving toward fulfillment of its potential. The middle portion, 15th Street to 10th Street, has been virtually completed as an urban park with Waterloo Park and Symphony Square. The upper portion of Waller Creek, that flows through the University of Texas, is being planned as a linear park and trail. The lower portion, from 10th Street to the Colorado River, is being planned in great detail as a zone for urban development.

Ninth Street to Town Lake, develop the Glenn Oakes Greenbelt on Boylston with trails and picnic tables, extend Stacy Park's trail to Town Lake Creek, and beginning the redevelopment of Waller Creek from Tenth Street to Town Lake.

WALLER CREEK

The Waller Creek project required the services of consultants to prepare a plan. In the summer of 1975 several architectural firms were selected. The resulting plan involved considerations of traffic flow, economic stimulations, zoning patterning problems, biking trails and fair hiking trails, existing trees and green residential possibilities and historic recreations, among other concerns. A committee, proposed by the Board of Parks and Recreation and selected by PARD with the consultants in the early stages of the plan. More money was requested in the December 1975 bond election, totaling \$1.5 million to Waller Creek's development over the next several years including nearly \$8 million for creek parkland acquisition and development.

Concurrent with the planning of ten blocks of Waller was the development of Symphony Square and Waterloo Park on the adjacent five blocks, an area which had been in the planning stages for several years. Symphony Square embodies all three project areas of the Bicentennial in its restoration of four historic buildings on the creek, accessible by trail north toward the University and south toward downtown, and providing the central city with cultural opportunities previously unavailable in that area.

The University of Texas, encouraged by the student body as well as the city's Bicentennial plans on Waller, began planning for its portion of the creek. The Student Union, the



WALLER CREEK

CHARRETTE REPORT

1998



STREETS TO BE REDESIGNED

Waller Creek Greenway Action Plan

Austin, Texas

Action Plan Report

November 2000

Prepared for:
The Waller Creek
Greenway Partnership

Prepared by:
GREENWAYS
INCORPORATED
Bicycle & Pedestrian Planning
Environmental Design
Landscape Architecture

Waller Creek Greenway Partnership

Waller Creek Characteristics

For the purposes of this Greenway study, there are three distinct characters or zones within the Waller Creek Greenway study area.

Zone 1: Lower

Town Lake to 5th street. This area consists of a fragmented natural landscape that has poor access to the lower water level. Bank erosion is prevalent due to high peak flow and poor maintenance.

Zone 2: Middle

Fifth street to 10th street. This area has a canyon effect where buildings like the Sheraton Hotel dominate the landscape. Access to the waters of Waller Creek are improved, however much of the stream channel is comprised of human structures.

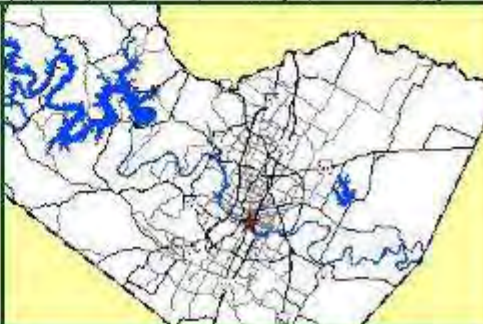
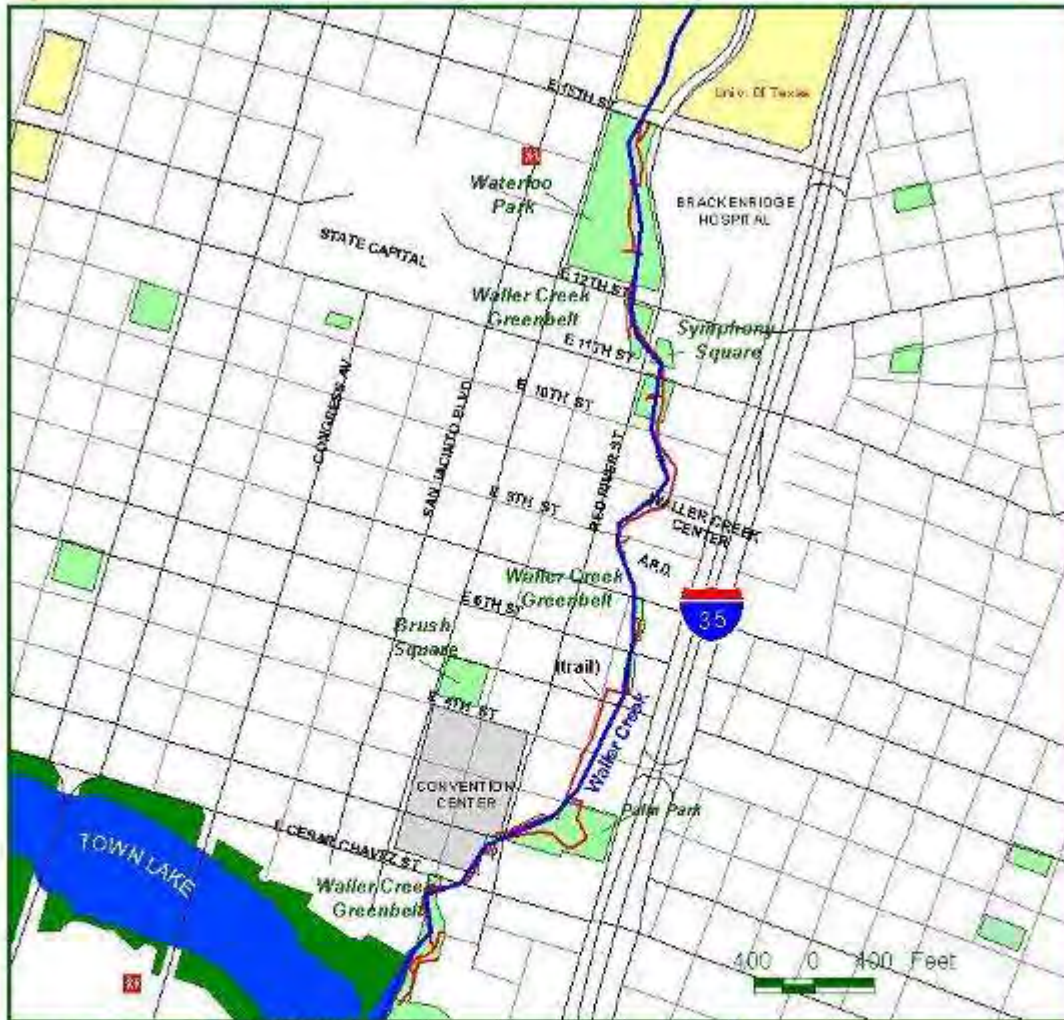
Zone 3: Upper

Tenth street to Waterloo Park. This area blends the natural with the urban conditions that reflect the first two segments. Some of the best examples of good stream architecture are located in this zone (wall treatments, paving, tree wells and spatial qualities of the corridor).



Figure 12: For the purpose of the Greenway study, the consultant has divided Waller Creek into three distinct zones. Zone 1: Lower Creek; Zone 2: Middle Creek; and Zone 3: Upper Creek.





IH 35

East Ave.

10th St

8th St

7th St

6th St

5th St

4th St

3rd St

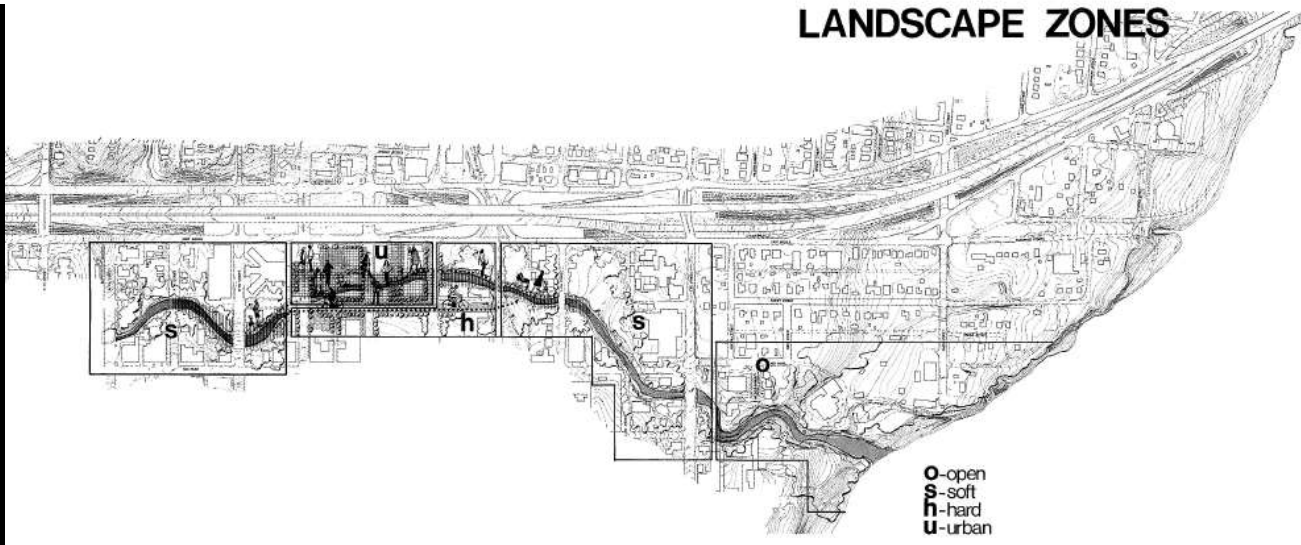
Red River

PHASE A WALLER CREEK DEVELOPMENT PLAN

WALLER CREEK JOINT VENTURE
Taniguchi Shetelman Vaccar Minter, AIA
Myrick Newman Dahlberg, ASLA
Freese and Nichols, PE

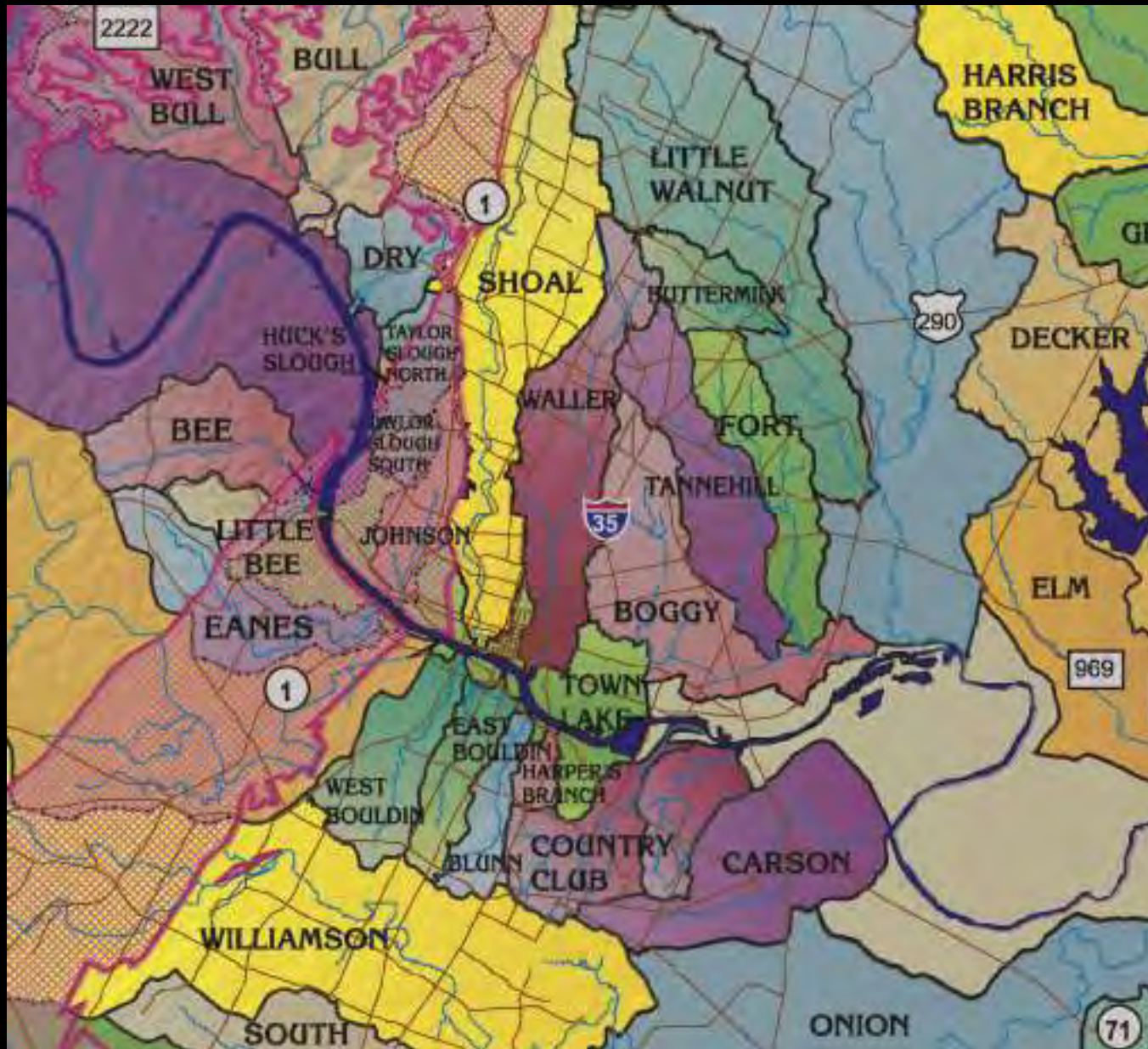


LANDSCAPE ZONES



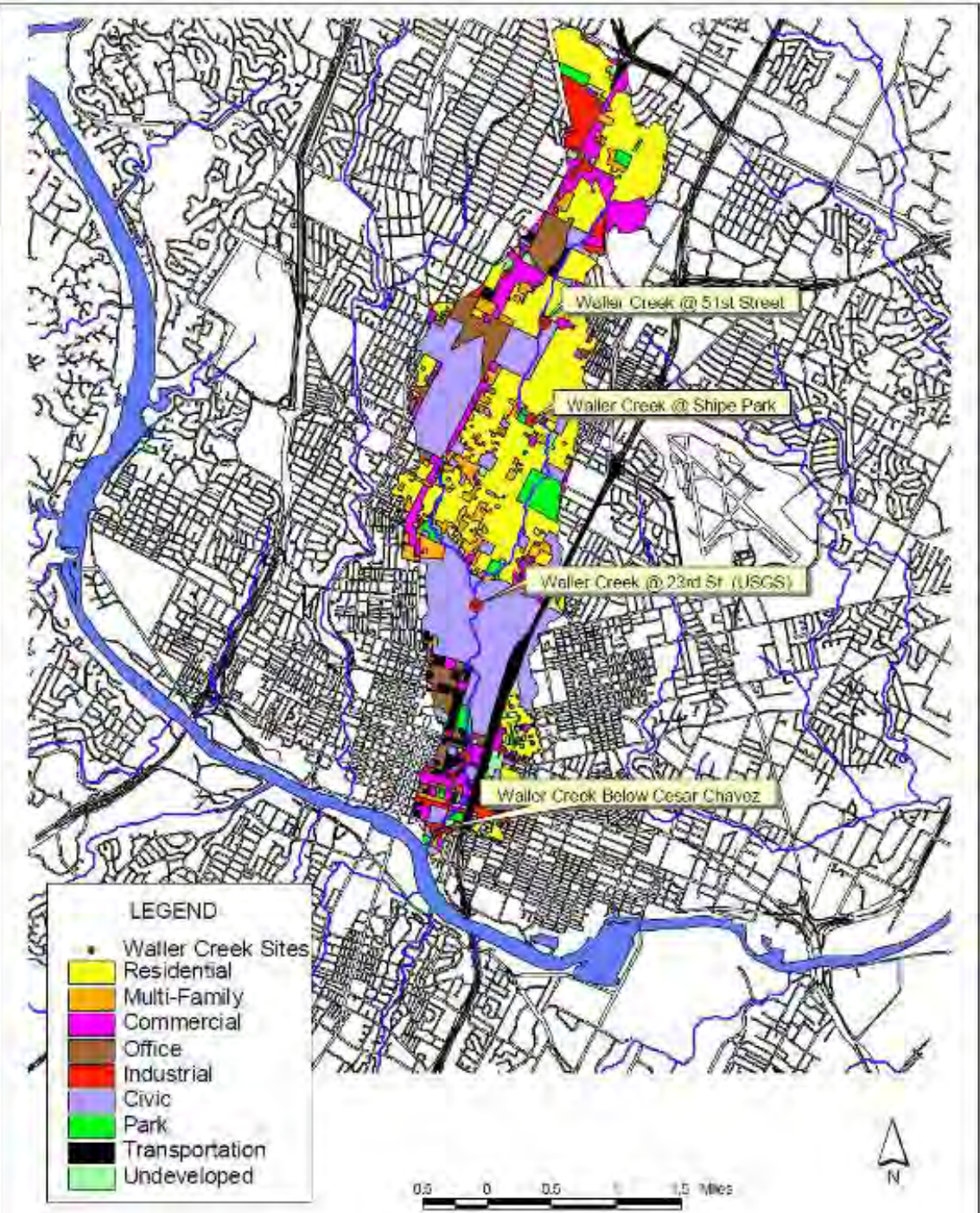
o-open
s-soft
h-hard
u-urban

The 21st Century – Creating a Hydrological Cyborg Creek



Highly Urbanized Watershed

Waller Creek is a 3662 acre watershed located within the urban core of Austin



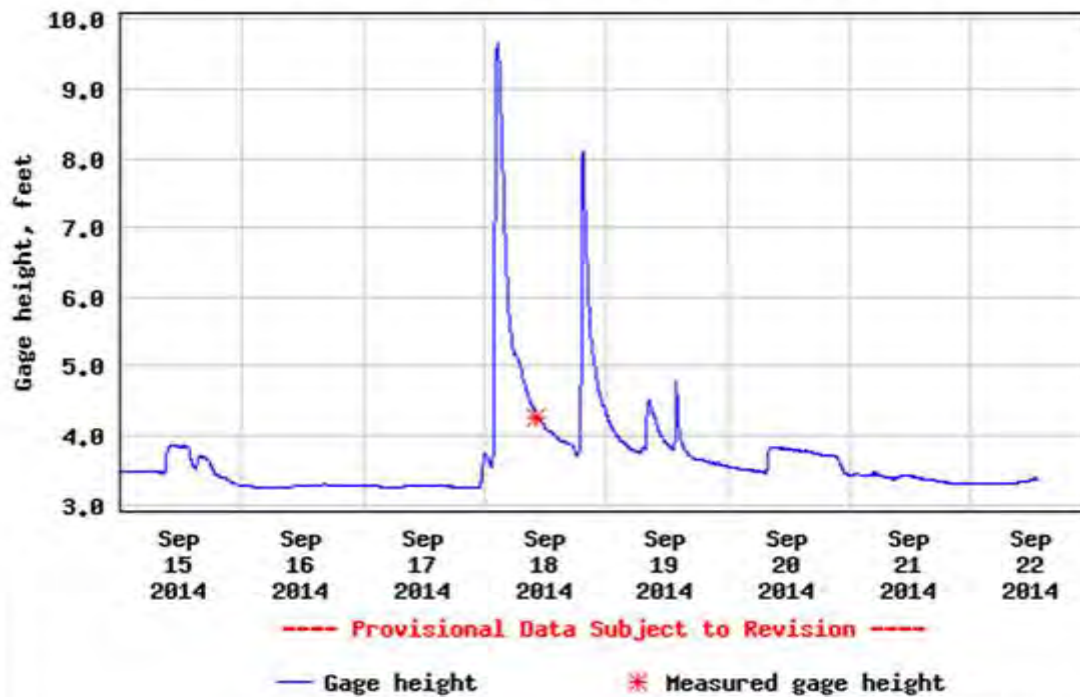
Highly Studied Hydrology

Two flow gauging stations, set up by the US Geological Survey (USGS), are located

08156910 Waller Creek at Koenig Lane, Austin, TX

08157560 Waller Creek at E 1st St, Austin, TX

USGS 08157560 Waller Ck at E 1st St, Austin, TX



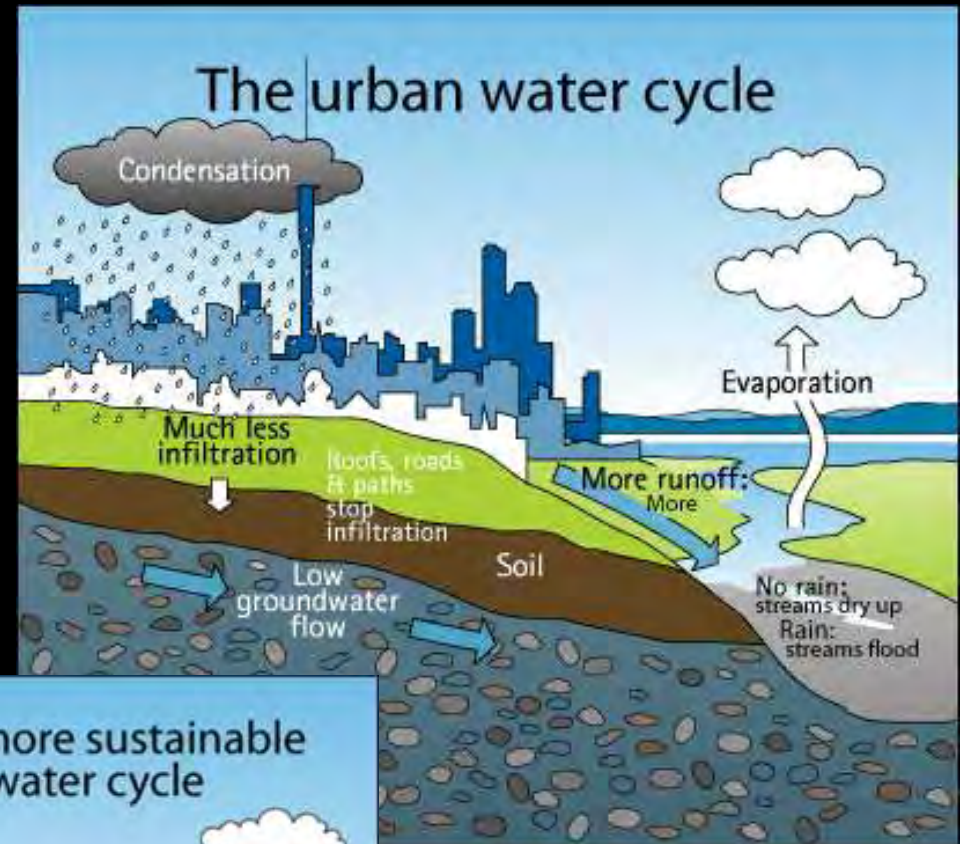
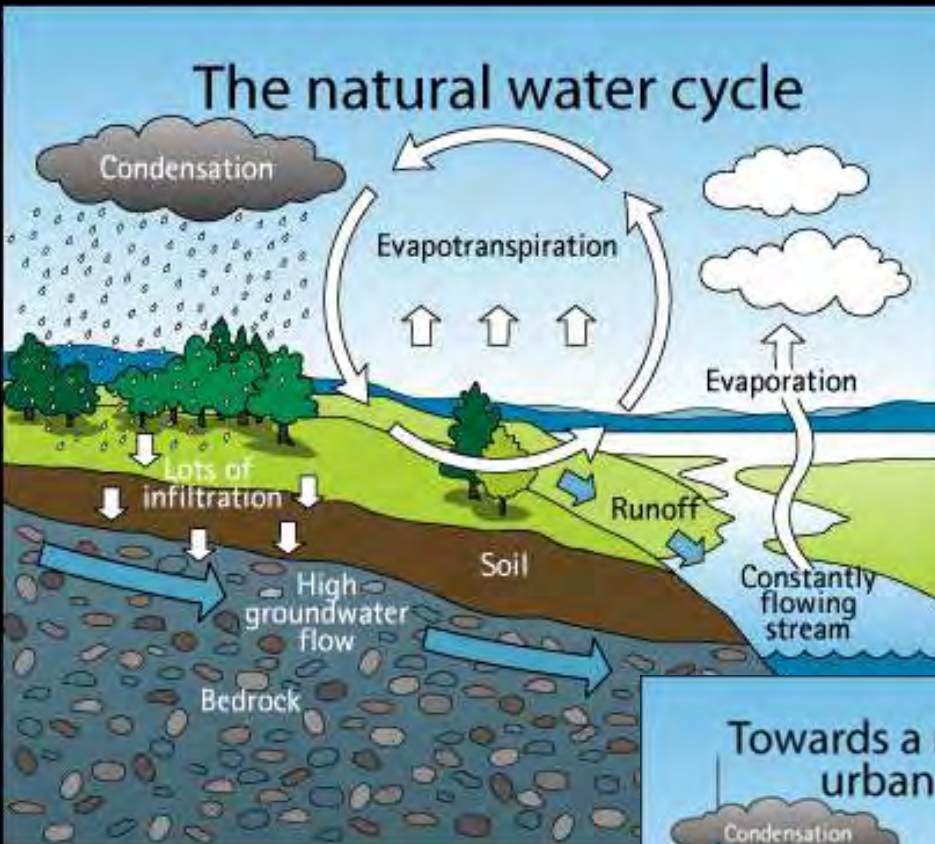
Graph courtesy of the U.S. Geological Survey



Hemphill Park Flooding 1998


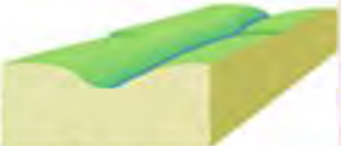




Natural Hydrology vs. Urban Hydrology



The Life of an Urban Creek

Upper Course, Middle Course, Lower Course

Course Stage	Upper Course Youth Stage	Middle Course Mature Stage	Lower Course Old Age Stage
Slope	<p>Stage</p> <p>Youth (Upper course) Maturity (Middle course) Old age (Lower course)</p> <p>Gradient (or slope) of river flow (long profile)</p>  <p><i>steep slope</i> <i>gentle slope</i> <i>almost flat</i></p>		
Main processes	Hydraulic Action Abrasion Erosion	Erosion and Deposition	Deposition
Valley shape	<p>Valley Shape</p>  <p><i>'V-shaped' valley (narrow floor and steep sides)</i></p>	 <p><i>Valley trough (wide floor and fairly gentle sides)</i></p>	 <p><i>Plain (flat, low land)</i></p>
Main features	V-shaped Valleys Interlocking Spurs Waterfalls	Meanders and Ox-Bow lakes	Deltas Levees Flood Plains (and <u>m+ob</u> lakes)

Upper Course – Headwaters

The Rain Catcher Pilot Program (RCPP) Austin Watershed Protection Dept.

- a comprehensive effort to integrate and leverage the City's existing Green Stormwater Infrastructure (GSI) programs and resources.

An extensive scientific modeling exercise selected the headwaters of Waller Creek as the pilot program location. This small urban area is 2.8 square kilometers (1.08 square miles) with 46% impervious cover (hard surfaces like driveways and roofs) and limited options for traditional stormwater controls.

Demonstration project sites within this area include Reilly Elementary School, West Skyview Road, several right of ways, and private homes. The incentive package for homes is being offered to 25 pre-selected homes in 2018 and will expand to a larger area in 2019.



Central Park Wet Pond

Constructed: 1998

Watershed: Waller Creek

Location: Behind Central Market and the apartments at 38th Street and Lamar Avenue

Pond Watershed: 173 acres

Impervious Cover / Drainage Area: 54%

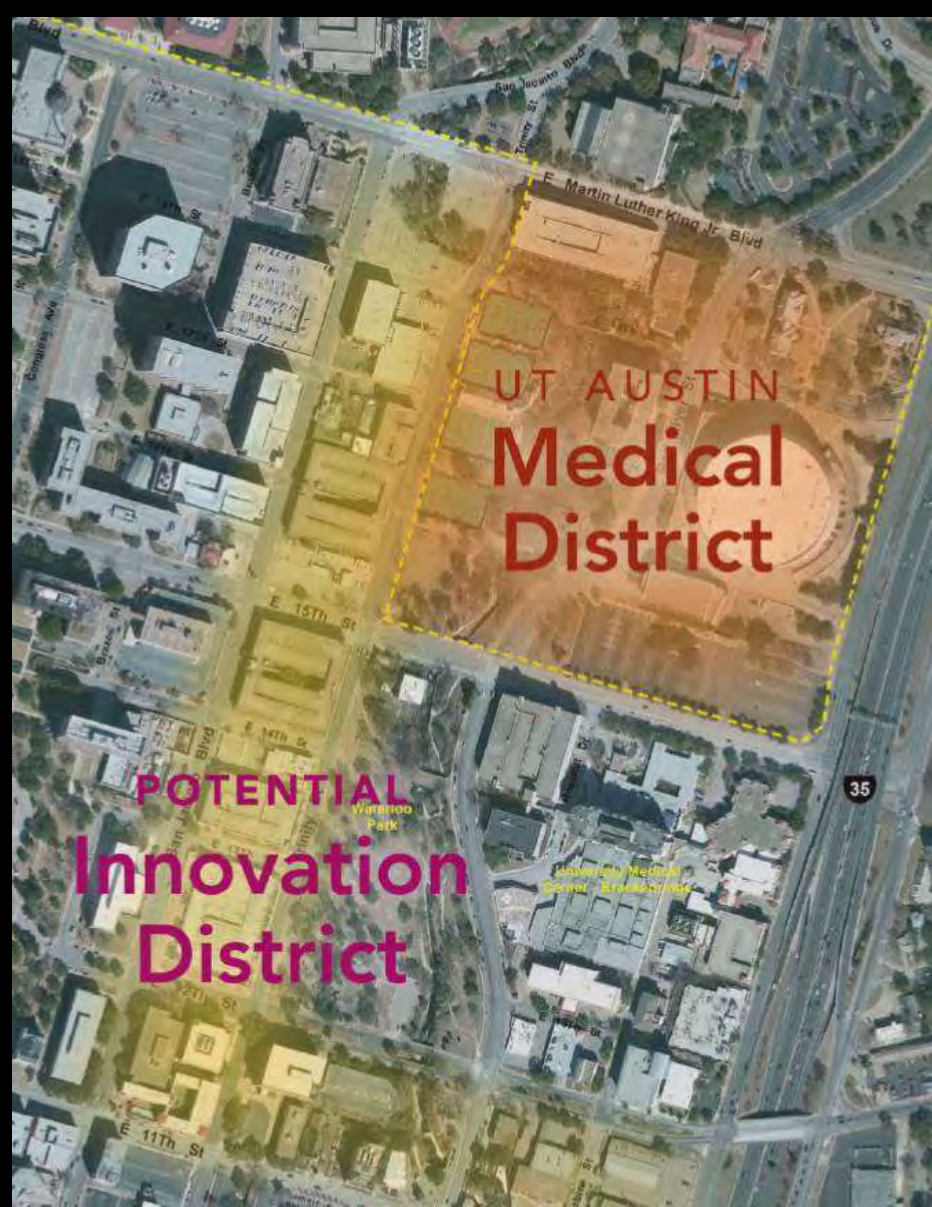
Pond Goal: Water Quality Protection

Pollutant Removal: 50,000 lbs. Total Suspended Solids (TSS) removed annually



Middle Course – University of Texas





The University continues to grow and surround Waller Creek



PHASE 2

Future Medical District Program



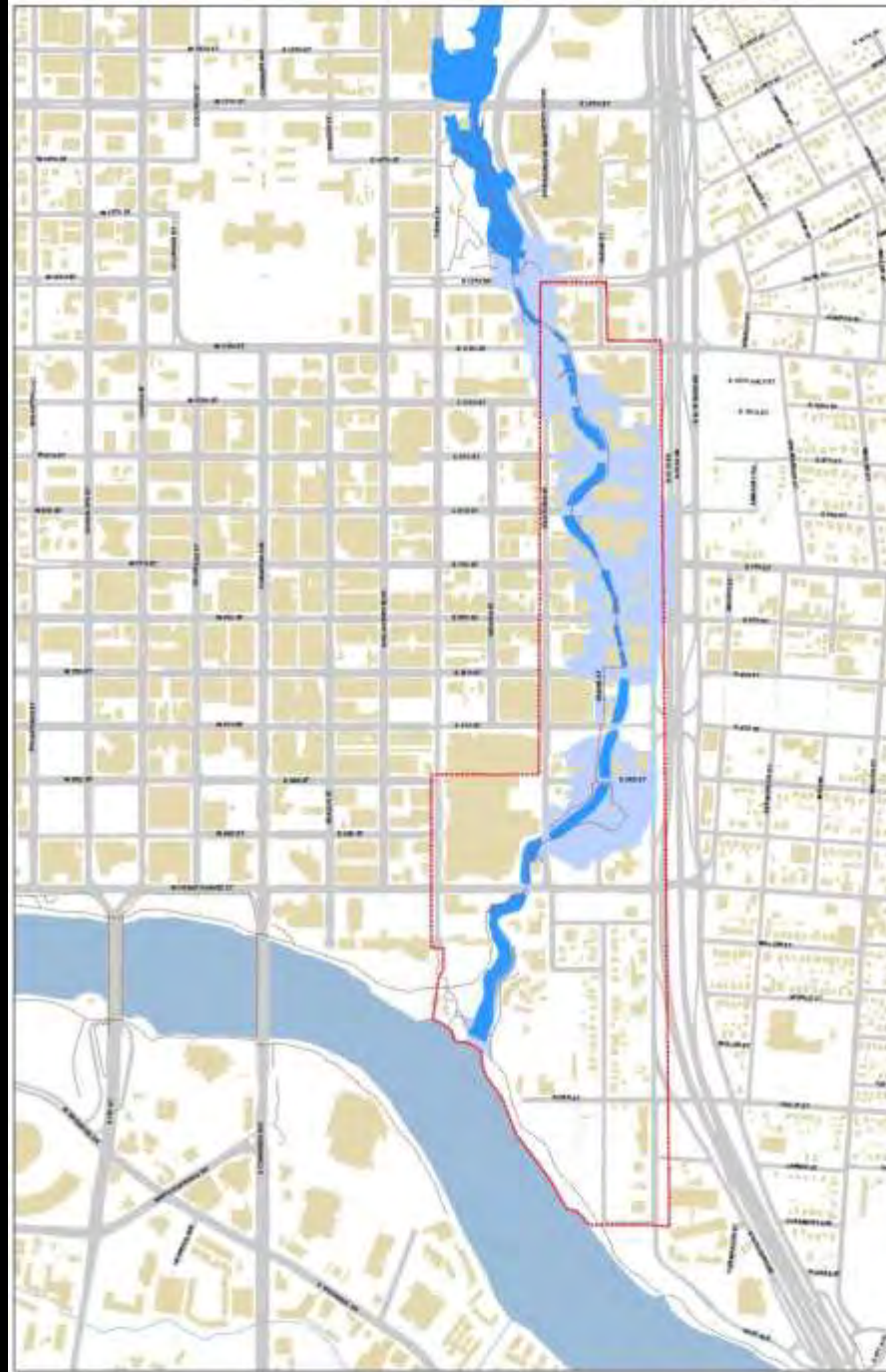
FINAL BUILD-OUT

Future Medical District Program





Lower Course - 15th - Mouth



Lower Waller Creek

Legend

- Blue line: Site Plan Program - Final Project
- Red outline: Site Plan Program - Study
- Red outline: Water Course 17
- Red outline: Study

Lower Waller Creek – The Dump

“We trust you need no reminding that Lower Waller Creek, from Waterloo Park to Town Lake, is a dump.

Or, to pinch a couple of the mayor's favorite phrases, "a running sore" and "an ugly hole in the ground."

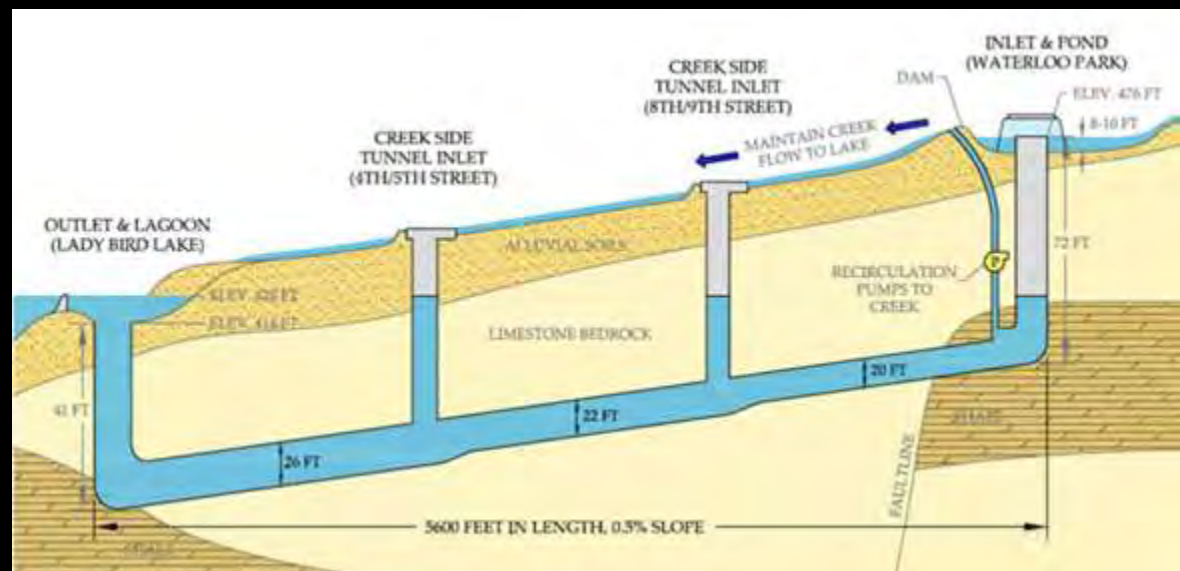
This is a point that seems conceded by "citizen" and "developer" alike, though their visions of what Waller Creek should look like may vary.”

Mike Clark-Madison *Austin Chronicle* 2002



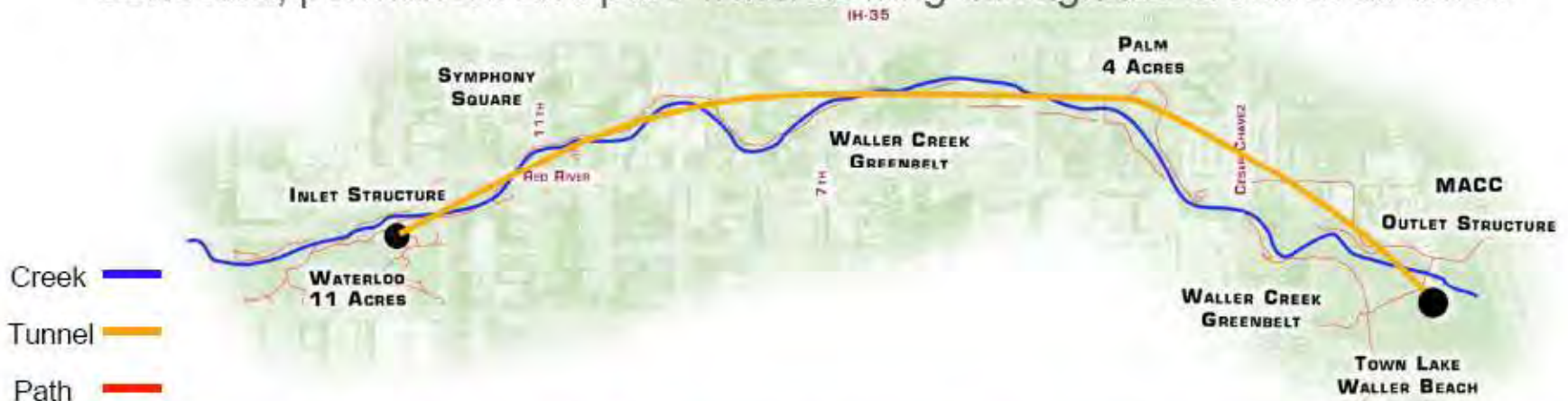





The Cyborg Creek and Socioecological Nature

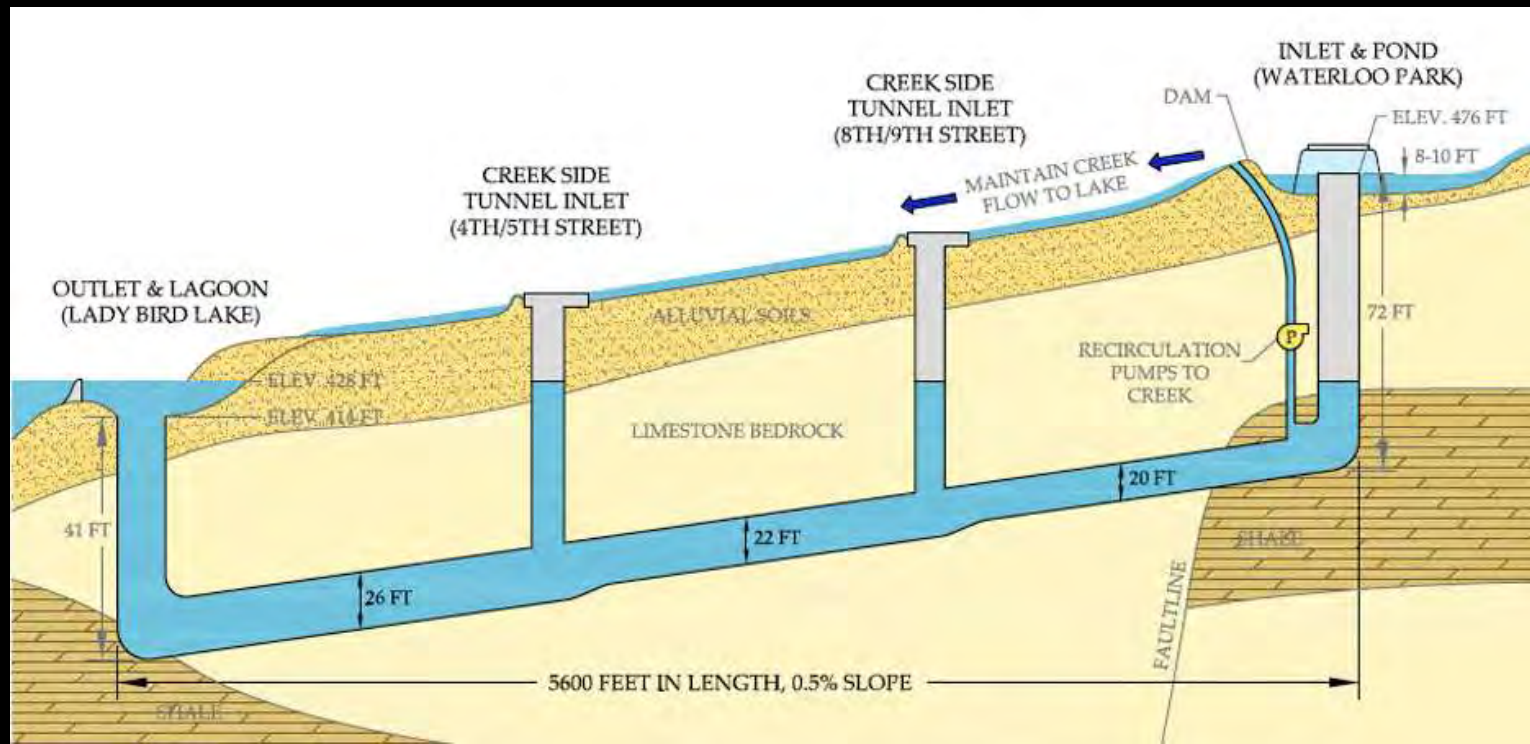


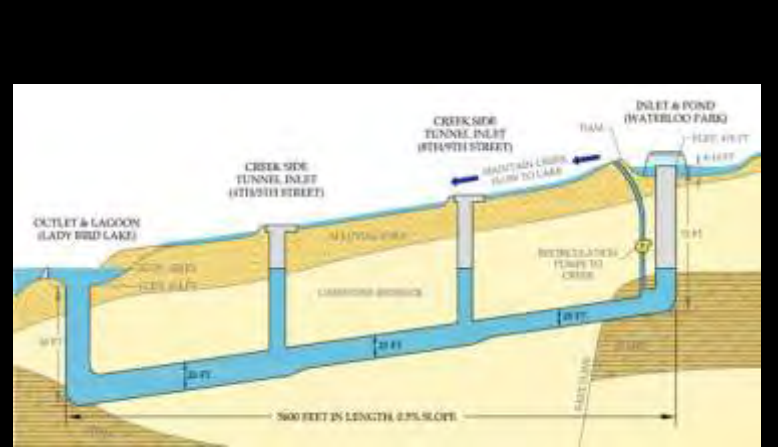
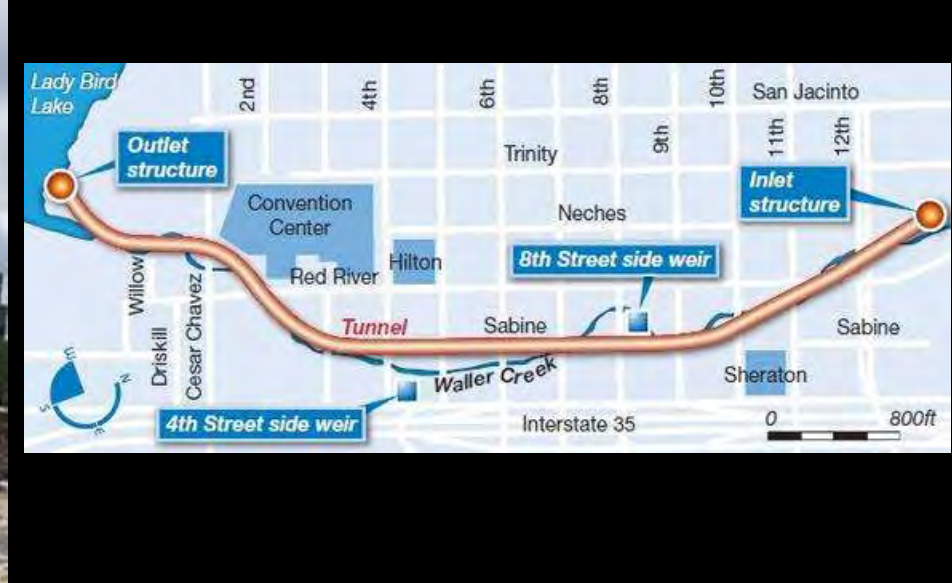
TUNNEL STRUCTURE

- Waller Creek drainage area is 6 square miles
- Tunnel would be **5,400 feet long, 22 feet in diameter, 70 feet below Sabine Street**
- Water will flow through the tunnel at **16 feet per second**
- Water will be pumped, via the tunnel, from Town Lake keeping **3-4 feet of constant, permanent and pure water** flowing through the creek at all times



Inlet		5,880 ft long	Outlet	
				







Waller Creek
Conservancy





Waller Creek
Conservancy

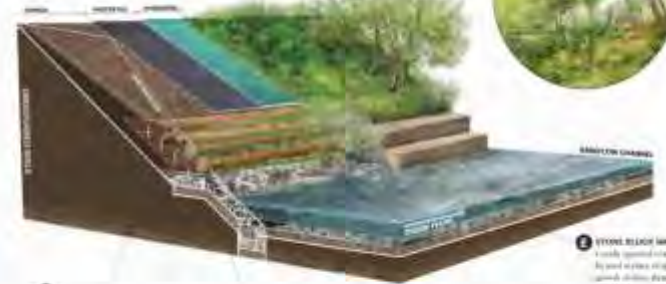
waterloo
greenway



Reconstructing Failed Slopes

F HYDROBLASTIC MESH
Applied along foundation to prevent
erosion, deep maintenance
access & repair

A VEGETATED GRADED SLOPE
Reinforced with geotextiles to stabilize
erosion-prone soils and provide
ecosystem, sediment and water
retention benefits

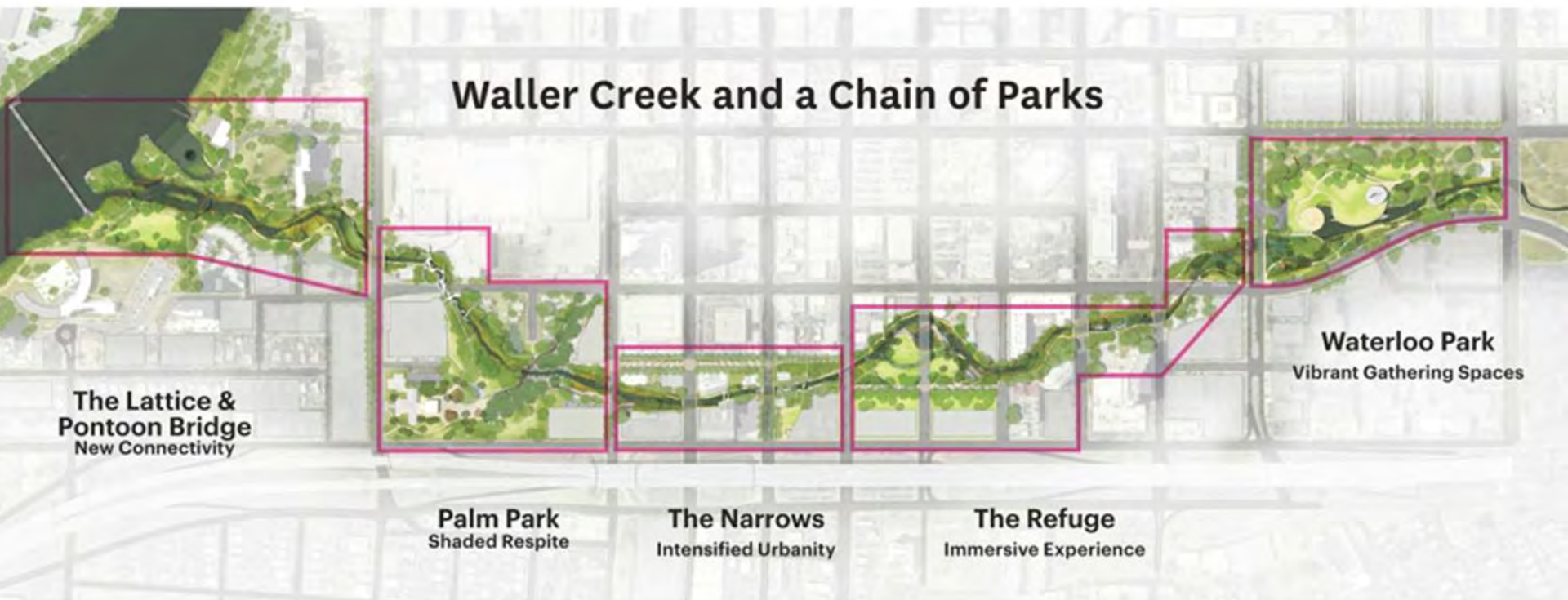


G SOIL LIFT
A 12" wide, 12" high, 12" deep
soil lift is placed in the
voids between the mesh
to provide additional support

C LAY STRIPS
12" x 12" strips of
high strength fabric
are placed in the
voids between the
mesh to provide
additional support

H HYDRA-TIE
Hydra-Tie is a
specialty geotextile
that provides
additional support

E STONE BLECK WALL
A wall of stone blocks
is placed in the
voids between the
mesh to provide
additional support



Waller Creek and a Chain of Parks

**The Lattice &
Pontoon Bridge**
New Connectivity

Palm Park
Shaded Respite

The Narrows
Intensified Urbanity

The Refuge
Immersive Experience

Waterloo Park
Vibrant Gathering Spaces



“Natural Character with Stream Stability”



Natural Character?

“A “Grow Zone” is an effort to halt mowing along streams and allow the growth of more dense, diverse riparian vegetation. This improves water quality, lessens erosion, increases wildlife habitat, and provides other ecosystem services. It is our hope that Austinites will embrace these changes and appreciate the benefits of natural stream corridors.”



Mowed



First Year Growth



5 to 10 Years

A sign for a Sensitive Creekside Area. It features a logo of a bird on a branch over a stream. The text reads: 'Sensitive Creekside Area', 'Grow Zone (No Mowing!)', 'Riparian Zones with tall grasses and plants:', 'Improve water quality and quantity', 'Stabilize streambanks from erosion', 'Provide wildlife habitat and food', 'Shade streams and lower temperatures', 'Zona ribereña delicada ¡No corte las hierbas!', and 'Zona ribereña de pastos altos y plantas silvestres:'. It also lists benefits in Spanish: 'Mejoran la cantidad y calidad del agua', 'Estabilizan las orillas de erosión', 'Proporcionan un entorno de vida silvestre y de alimentos', and 'Hay mucha sombra para el suelo y para reducir las temperaturas del agua'. The website 'www.austintexas.gov/watershed/creekside' is listed on the right side.

The Wild Urban Woodlands of Waller Creek Natural Character?

2017

Dynamic
Self Organizing
Tolerant of Disturbance
New Combination of Species

But does not fit into traditional kinds of Nature...except as a problem to be remedied.

“Maybe it’s not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk.”



2005



2007



2009



2012

“Maybe it’s not nature at all”

New Ecology and Novel Ecosystems

- Assemblages of species in a given area that have not previously occurred.
- Novel ecosystems are not under human management, but they are mostly the result of direct or indirect human activities.
- They lack natural analogs (historical naturalness)
- The Adaptive Cycle
- Resilience and Ecology
- Socioecological Nature

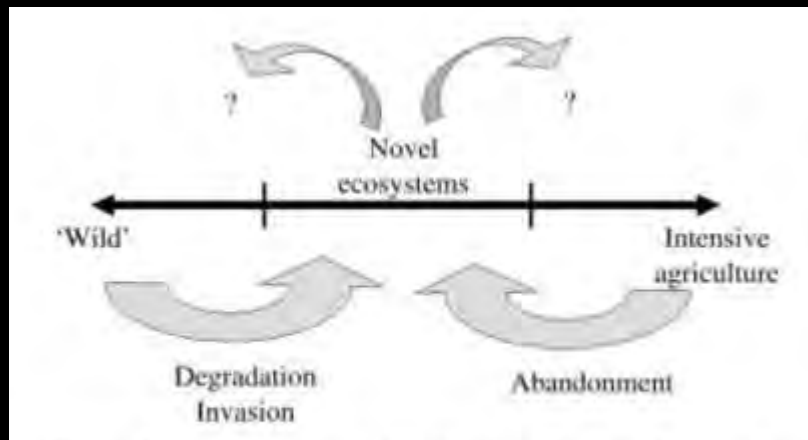
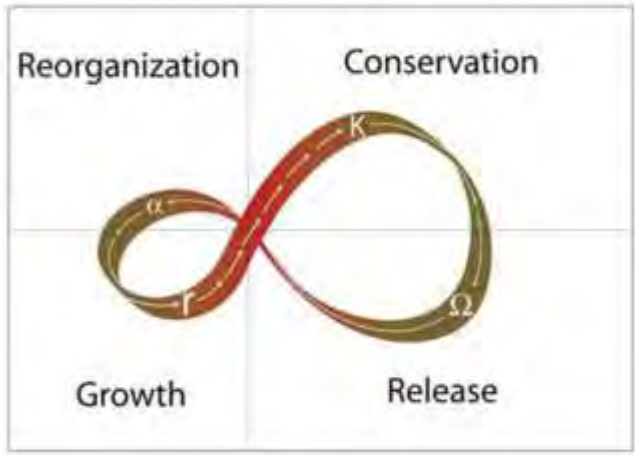
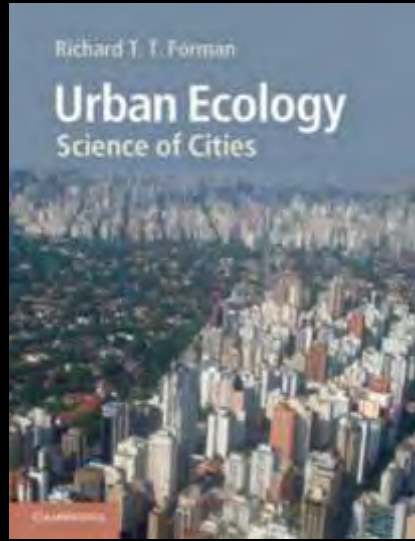
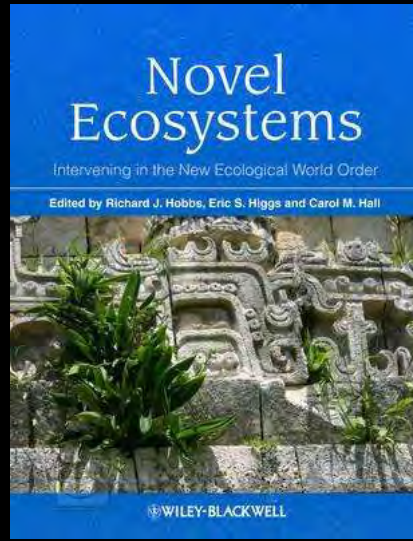


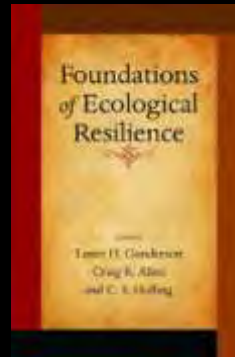
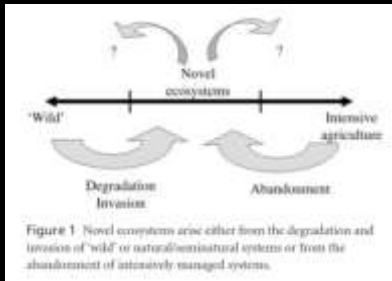
Figure 1 Novel ecosystems arise either from the degradation and invasion of 'wild' or natural/seminatural systems or from the abandonment of intensively managed systems.

Resilience

2017

...the ability to absorb disturbances, to be changed and then to reorganize and still have the same identity (retain the same basic structure and ways of functioning).

A resilient ecosystem can withstand shocks and rebuild itself when necessary.



2005



2007



2009



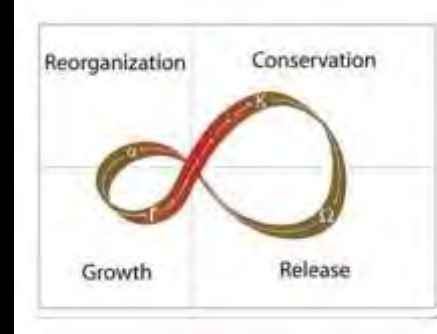
2012



Natural Character?

Prospective Naturalness and Prospective Ecology

The Wild Urban Woodlands of Waller Creek

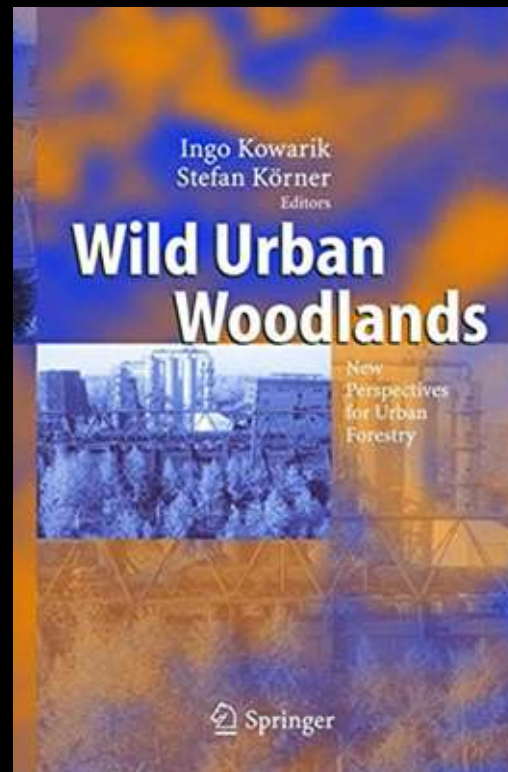


Prospective naturalness...

“the reference point is not an original condition of a natural landscape, but rather a condition defined based on the current site potential and the greatest possible degree of self-regulation.

From this perspective, therefore, the natural capacity for *process* is the central point, not a particular, retrospectively determined and often idealized, *picture* of nature.”

2005



2017



Cultural/Human Geography

Knowing and Inhabiting

Waller Creek



The Creek is an ever-visible manifestation of continuity, of life; the amount and nature of what it carries along, in addition to its variable current of water, keeps changing; the bed is hardly the same from one day (or even hour) to the next, though the variations are normally undramatic.

Besides being part of the landscape, as one of the most active agents of landscape-making, it is the sum total of many processes, and intricately integrated process in itself.

The fact that it has been interfered with by man, and continues to be interfered with, must be accepted as part of such total process, whatever opinion may be held as to the merits of the interferences, including certain sandbars, eddies, and transitory whirlpools in the writer's mind, commingled with less perishable small events in nature.

Joseph Jones, *Life on Waller Creek*

2005



2007



2009



2012



The future of the Waller Creek ecosystem will be similar to its past - change and process, disturbance and response. Climate change and urban growth will once again reshape the lifeworld along the creek and the flow of the creek itself.

As in the past, this change will have major implications for the humans settled along the creek, but, on the creek's timescale, it is one more phase in that "manifestation of continuity" - the natural history of Waller Creek.

The ecosystem of Waller Creek has proven resilient in spite of urban impacts. Nature persists and flourishes given opportunity to root and grow.

The vibrant cosmopolitan community of plants and animals gathered along the creek today reflects the vibrant cosmopolitan community that makes up the human population of Austin. And, just as before, these species from around the world have mixed with species that persist from the Pleistocene, with the old-timers and the newcomers making Waller Creek their home.
(Anderson, *Austin's Waller Creek*)



A creek is the embodiment of change and process, a gathering of time - past, present, and future - revealed in the stony bed of the creek, in the plants and animals gathered on its banks, and in the water flowing over run and rill down to the Colorado River.

Thus, the nonhuman history of Waller Creek is a narrative of that change and process, in which disturbance and response and loss and gain is inextricably bound up in the human history of Waller Creek.

Anderson, *Austin's Waller Creek*)



“The Creek, if we will only let it, will keep reminding us of all this at the same time it offers us other gifts;

solitude or limited companionship as needed and wanted;
earth, air, and water in slow procession and interaction
under the radiant presence of fire;

plants and animals living or present in fossil forms; sounds
kind to the ear; color, line, mass, and texture both natural
and manmade in luxurious profusion; unhasty alteration
within encompassing continuity;

the gradual submission of mind and body to easy yet
powerful rhythms not elsewhere to be felt – a place where,
as Izaak Walton liked to say, we may “study to be quiet.”

Joseph Jones, *Life on Waller Creek*

