Environmentally Sensitive Areas – Recent Changes to Denton's Regulations

2019 Urban Riparian Symposium

CITY OF DENTON

UNT
EST. 1890

TEXAS WOMAN'S UNIVERSITY
SCIENTIA LUMEN VITAE

136,268
2017 Population

40.8 %
Population Increase 2000-2010

29.9
Median Age

$ 76,653
Median Family Income

$ 17.82
Median Hourly Wage

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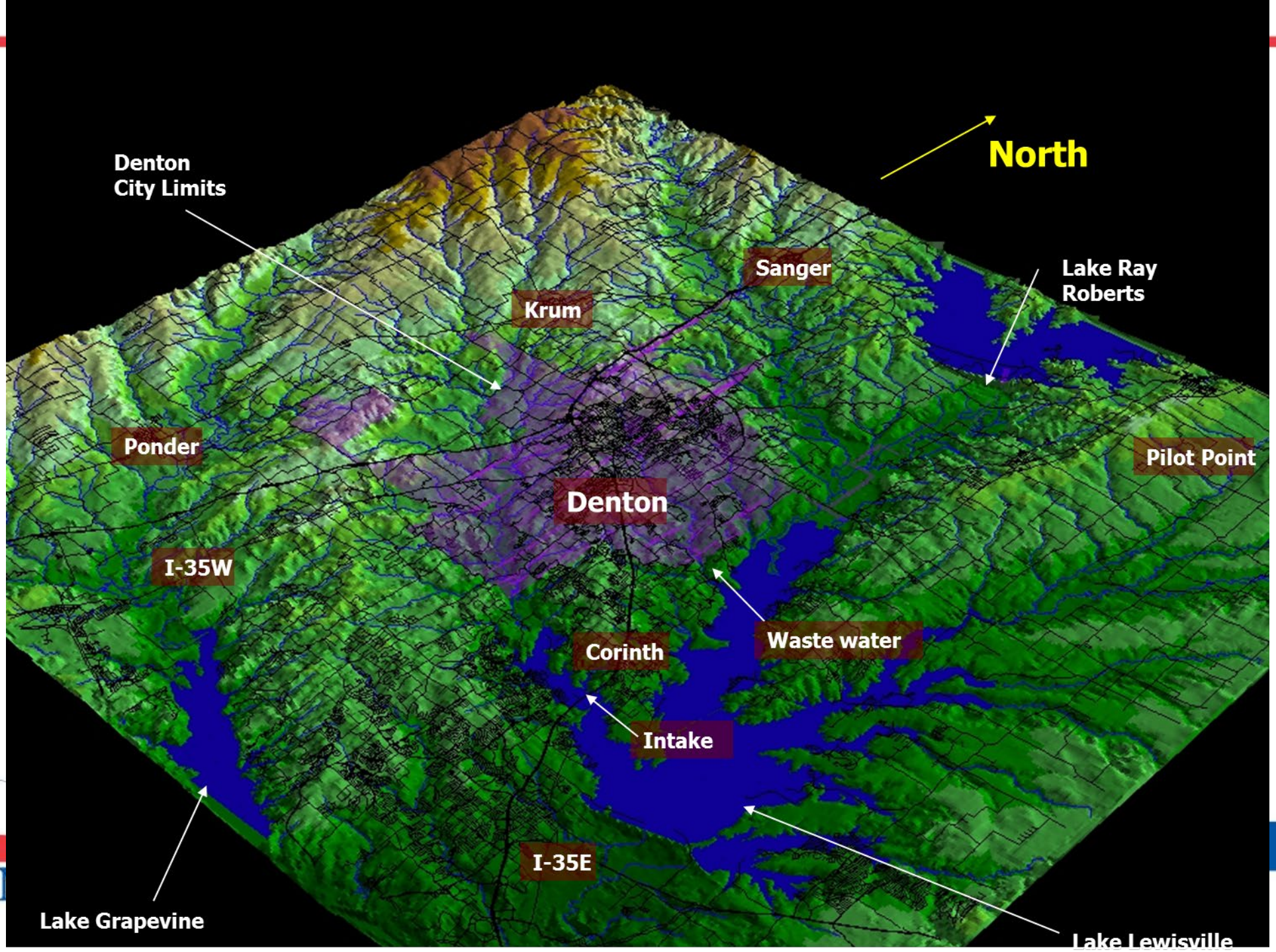
Introduction

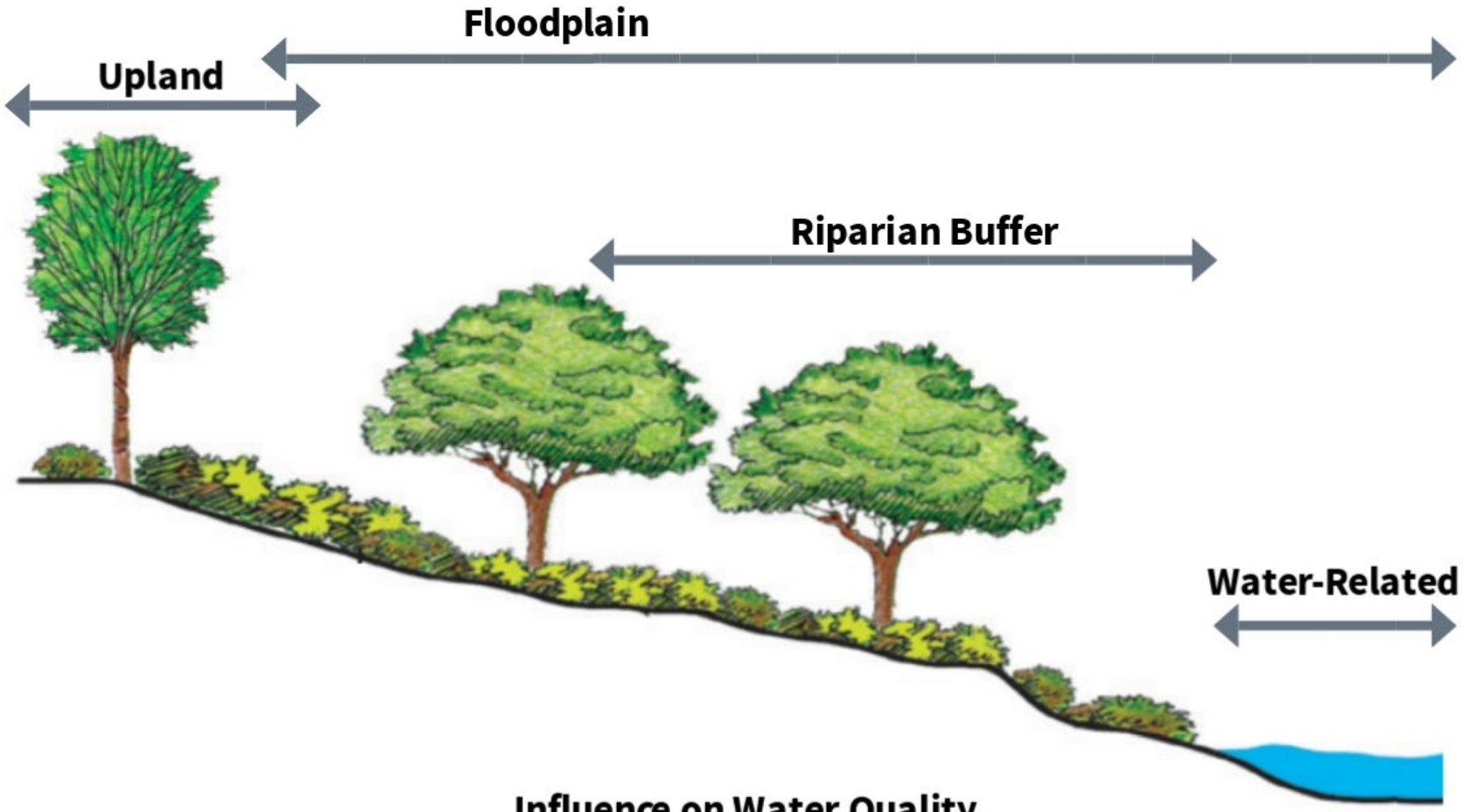
- What is in the Denton Development Code?
- Recent Changes to the Development Code.
- Introduction of an Environmentally Sensitive Areas Criteria Manual.

Denton Development Code – ESA Protection Requirements

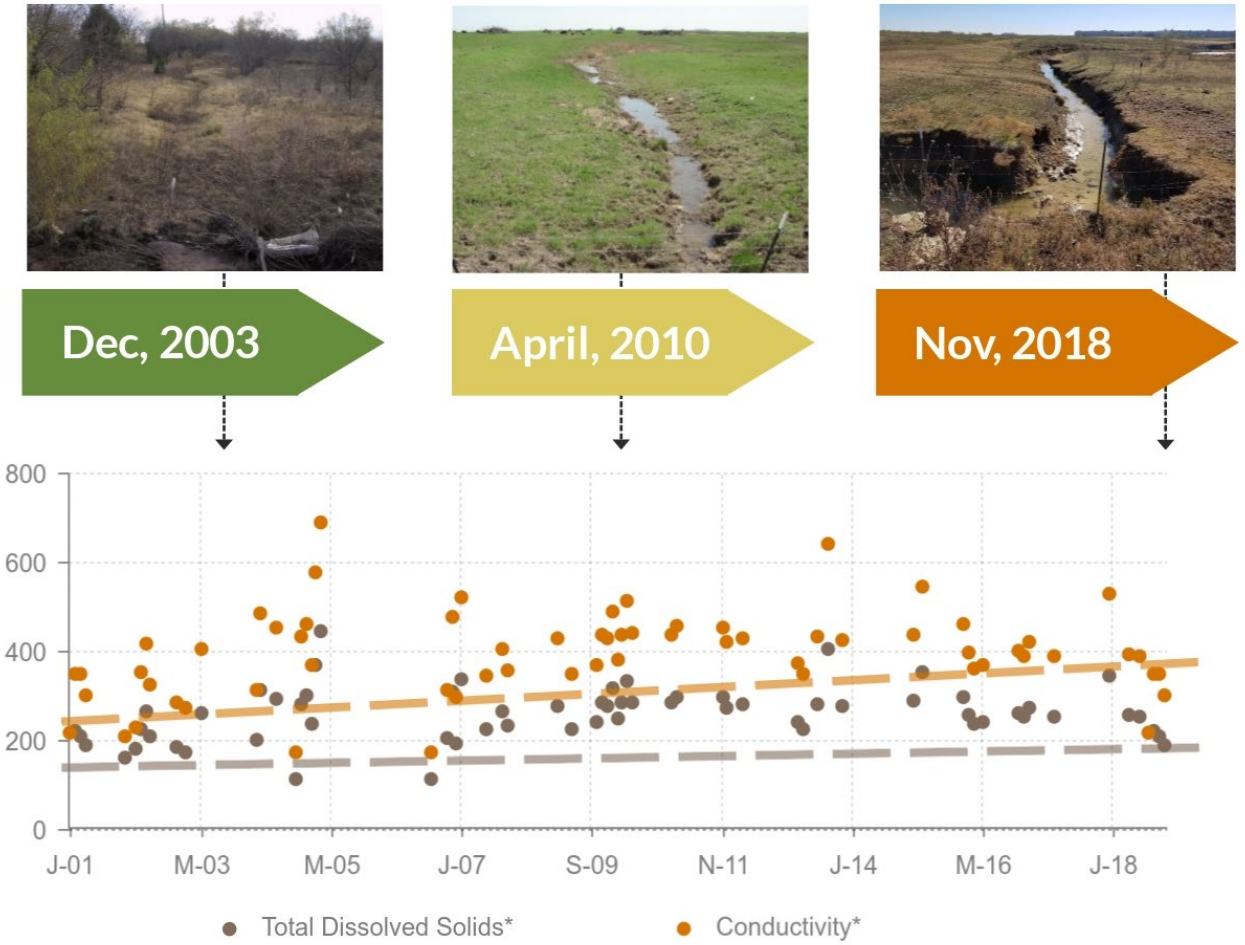
The purpose of this regulation is to:

- **Manage and protect** Environmentally Sensitive Areas within the City.
- **Protect the natural and ecological resources** that are essential elements of the City's health and community character and which provide irreplaceable plant and wildlife habitat;
- Establish a **development framework** for the City that is **respective of private property rights, while encouraging them to be used responsibly** for the benefit of the entire community;
- Preserve and enhance the City's distinctive community character and quality of life by ensuring that its natural and built environment are **consistent with the community vision and values** embodied in The Denton Plan.
- Establish regulations that **conform to the requirements of the state and federal government** regarding air quality, water quality, and environmental protection.


Denton
City Limits
North
Sanger
Lake Ray
Roberts
Krum
Ponder
Pilot Point
Denton
I-35W
Waste water
Corinth
Intake
I-35E
Lake Grapevine
Lake Lewisville


Floodplain
Upland
Riparian Buffer
Water-Related
Influence on Water Quality
Filter and sequester pollutants, material flows, groundwater recharge, habitat
organic matter input, shading
bank stability

Example of Riparian Buffer Loss



Total Dissolved Solids (TDS) and Conductivity provide a measure of the land erosion. As soil is lost to the waterway particulates and dissolved minerals decrease the quality of the water.

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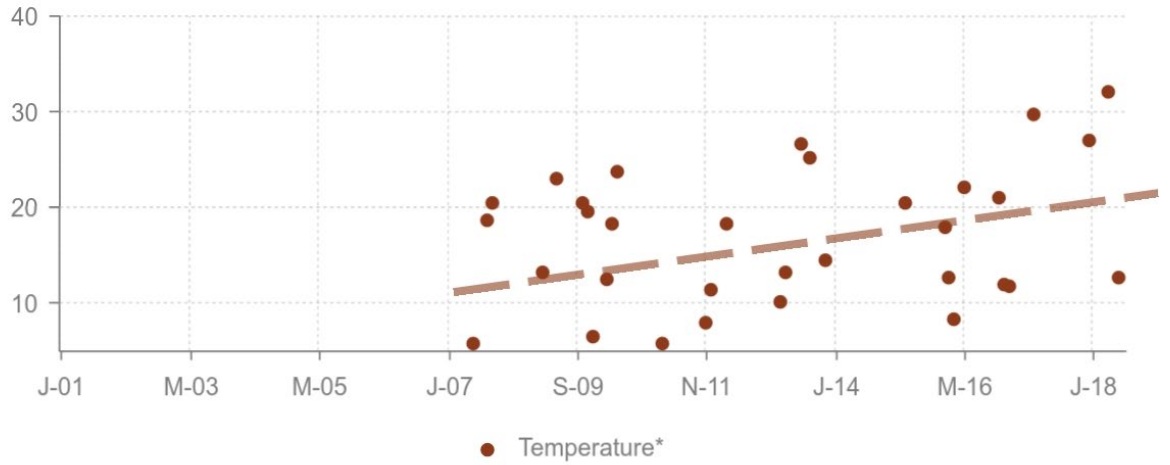
Example of Riparian Buffer Loss



A stable temperature is a function of the vegetation immediately surrounding a waterway, which provides shade and filtration. Higher temperatures decrease water quality and supporting habitat for wildlife that, in turn, further improve water quality.

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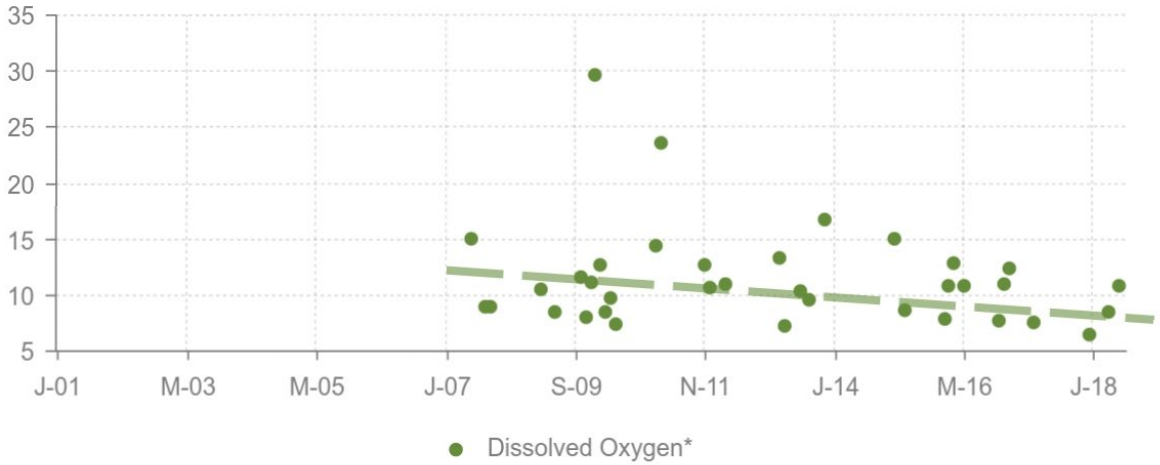
Example of Riparian Buffer Loss



Dissolved oxygen also supports wildlife in the waterway. As dissolved oxygen decreases there is a correlation in the loss of quality wildlife. Spikes in dissolved oxygen can be a sign of a flush of nutrients causing an unhealthy algae bloom.

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Protected Habitats: Riparian Buffers and Water-Related Habitat

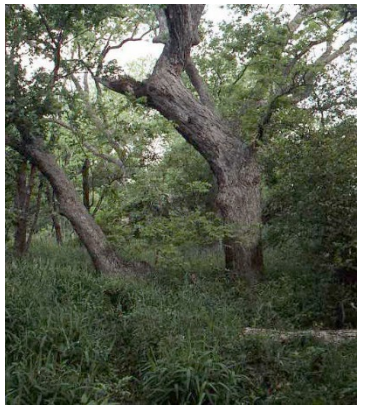
Riparian Buffers:

- habitat found to be in fair to good condition
- Buffers around water-related habitat

Watershed Size	Protected Width
Less than 1 mile^2	50 ft (100 ft total)
Greater than 1 mile^2	100 ft (200 ft total)

Water-Related Habitat:

- Wetlands, as they meet the definition of USACE
- Bottomland hardwood forests



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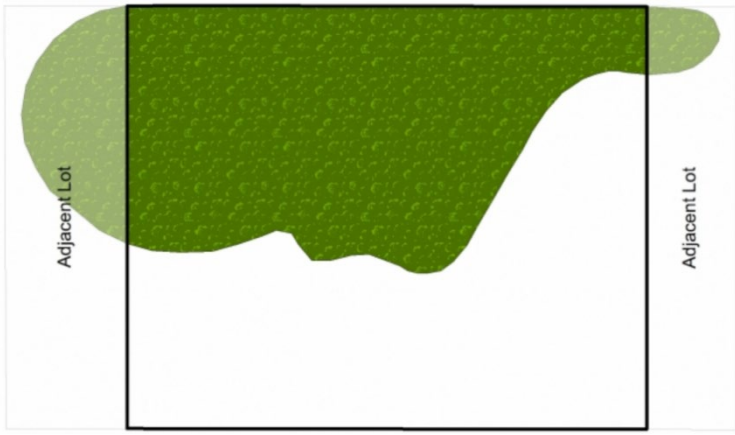
Protected Habitats: Floodplain Habitat

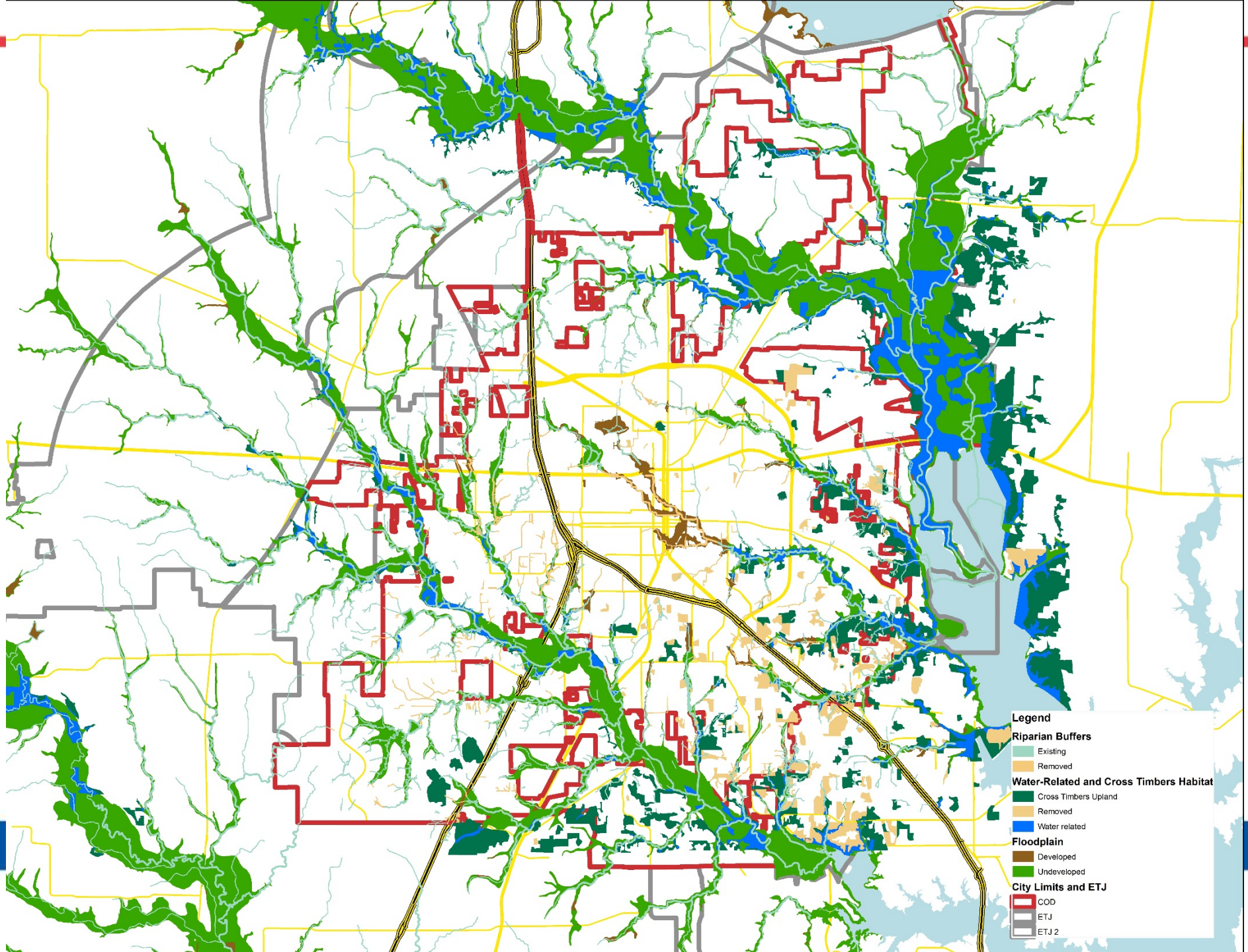
- Undeveloped land within the FEMA 1% chance (100-year) floodplain
- Undeveloped floodplain has:
    - Intact native vegetation
    - Lack of fill and grading
- Other habitat types can be nested within floodplain

Protected Habitats: Cross Timbers Upland Habitat

Type	Retain
Residential Development	50%
Non-Residential Development	30%

This is an ESA because there are 12 acres of original contiguous Cross Timbers Upland Habitat, although less than 10 acres are located on the subject property.





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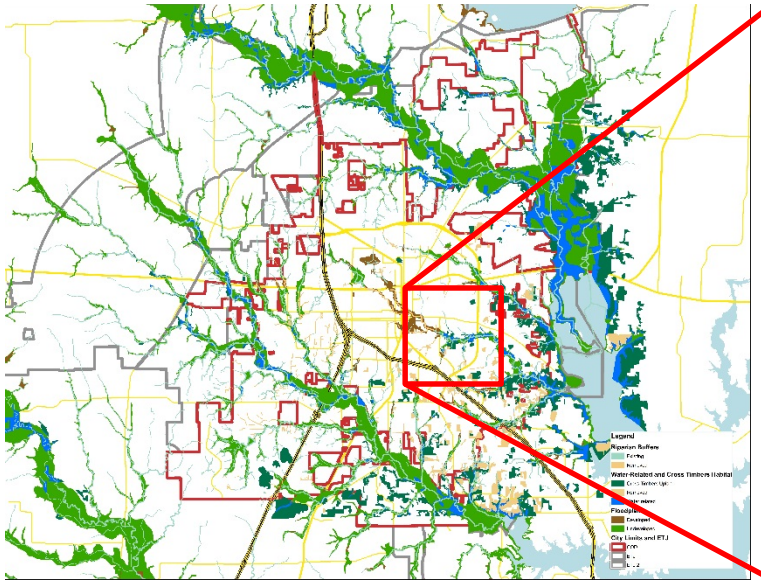
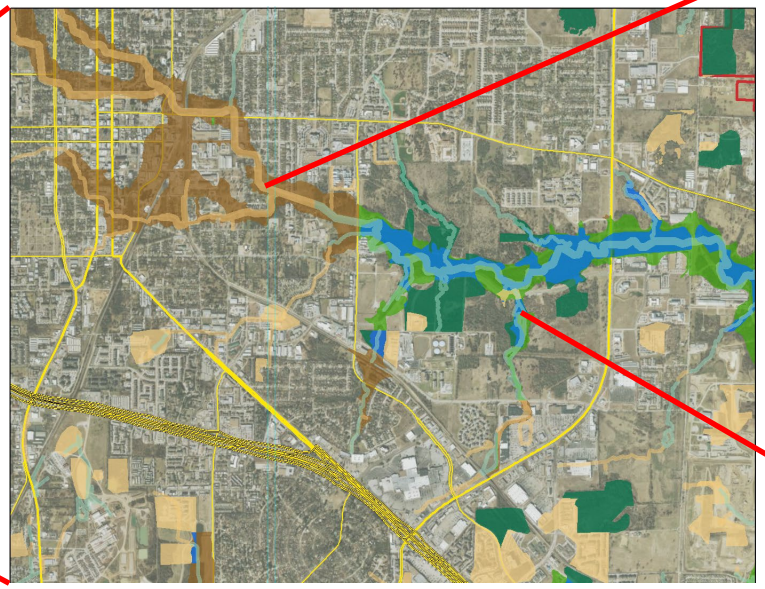
Identifying ESAs





Applying the Preservation Requirements

Platting

- Identify ESAs on the Official Map
- Confirm existence of ESA
- Identify any proposed encroachment

Alternative ESA Plan

- Approval for encroachment is similar to a Zoning Amendment
- Must meet criteria for approval

Site and Construction Plans

- Confirm conformance with regulations
- Confirm appropriate state and federal approvals
- Align Utility Plans

Development

- Provide protective fencing
- Prevent sediment loss to vulnerable areas

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Deviations from Protection Requirements – Alternative ESA Plan

- Criteria for Approval: mitigation analysis for in-kind replacement of the functions offered by the ESA to be removed (**35.17.11**):
  - Create, expand or improve preserved areas
  - Improve encroached habitat or environment
  - Maintain habitat continuity
  - Maximize public access and utilization
  - Preservation of the protected area in perpetuity
  - Create a high quality development

Recently Proposed Restoration Project

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME / COMMON NAME	SPECIFICATIONS	REMARKS
	CC	10	Cercis canadensis / Eastern Redbud	2" cal, 8'-10' Ht, 5'-6' spr	Full, Straight, Single Leader
	PM	11	Prunus mexicana / Mexican Plum	2" cal, 8'-10' Ht, 5'-6' spr	Full, Straight, Single Leader
	QR	17	Quercus shumardii / Shumard Red Oak	3" cal, 10' Ht, 5' spr	Full, Straight, Single Leader
	QS	17	Quercus stellata / Post Oak	3" cal, 10' Ht, 5' spr	Full, Straight, Single Leader
	UC	17	Ulmus crassifolia / Cedar Elm	3" cal, 10' Ht, 5' spr	Full, Straight, Single Leader

SHRUBS	CODE	QTY	BOTANICAL NAME / COMMON NAME	SPECIFICATIONS	REMARKS
	CBA	55	Callicarpa americana / American Beautyberry	15" Ht, 24" spr, 24" oc	Full

MISC	CODE	QTY	BOTANICAL/COMMON	SPECIFICATIONS
	MX	TBD	Blackland Prairie Mix	Height and Spread Varies. 10 lbs of BPM Per Acre, 75 Seedlings.
	MX	TBD	Riparian Recovery Mix	Height and Spread Varies. 10 lbs Per Acre

CITY OF DENTON REQUIREMENTS

MITIGATION REQUIREMENTS:
166' REQUIRED
166' PROVIDED

USACE REQUIREMENTS

50 STEMS PER ACRE
(0.52 ACRE x 50 STEMS = 26 STEMS REQUIRED)
40 STEMS PROVIDED (18 TREES, 27 SHRUBS)

CITY OF DENTON NOTES

1. CONTRACTOR MAY NOT TO INTRODUCE NON-NATIVE SPECIES OF PLANTS.
2. THE CITY OF DENTON NATIVE PLANT LIST HAS BEEN UTILIZED IN SELECTED SPECIES.
3. BLACKLAND PRAIRIE MIX TO BE UTILIZED. THIS MIX INCLUDES LITTLE BLUESTEM.
4. ASTRA WILL PREPARE AN ANNUAL REPORT EACH YEAR FOR THREE (3) CONSECUTIVE YEARS, BEGINNING TWELVE (12) MONTHS FOLLOWING THE COMMENCEMENT OF THE IMPLEMENTATION OF THE AEDA MITIGATION PLAN.
5. THE CITY SHALL INSPECT THE PLANTINGS AND DETERMINE WHETHER 93% OF THE PLANTINGS ARE HEALTHY AND HAVE A REASONABLE CHANCE OF SURVIVING TO MATURITY. AFTER CITY INSPECTION IT MORE THAN 10% OF VEGETATION IS FOUND TO BE DISEASED OR NOT HAVING A REASONABLE CHANCE OF SURVIVING, THEN ASTRA SHALL BE NOTIFIED TO REPLACE ANY UNHEALTHY OR DEAD PLANTINGS.

PLANTING NOTES

1. ALL PLANT MATERIAL SHALL BE INSTALLED ACCORDING TO SOUND NURSERY PRACTICES AND SHALL MEET ALL STANDARDS AS STATED IN THE LATEST EDITION OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. NO SUBSTITUTIONS IN PLANT MATERIALS SHALL BE MADE WITHOUT WRITTEN AUTHORIZATION FROM OWNER OR LANDSCAPE ARCHITECT. IN THE EVENT OF DISCREPANCIES BETWEEN THE DRAWING AND THE PLANT LIST, THE DRAWING SHALL PREVAIL.
3. LOCATE ALL UTILITIES PRIOR TO ANY DIGGING OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO EXISTING UTILITIES INCURRED BY HIS WORK.
4. REFERENCE IRRIGATION PLAN FOR SOD IRRIGATION INFORMATION.
5. STAKING AND GUYING ALTERNATIVES: METHODS INDICATED IN DRAWING DETAILS ARE PREFERRED. CONTRACTOR MAY SUGGEST ALTERNATE METHODS, ASSUMING FULL RESPONSIBILITY FOR THEIR IMPLEMENTATION. CONTRACTOR SHALL REPLACE, PLANT, OR UPRIGHT ANY TREES BLOWN OVER OR DAMAGED DUE TO INADEQUATE STAKING AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING UNTIL FINAL ACCEPTANCE. ALL REQUIRED LANDSCAPING SHALL BE MAINTAINED IN A NEAT AND ORDERLY MANNER AT ALL TIMES. THE WORK SHALL INCLUDE, BUT NOT TO BE LIMITED TO, MOWING, EDGING, PRUNING, FERTILIZING, WATERING, WEEDING, AND OTHER SUCH ACTIVITIES COMMON TO THE MAINTENANCE OF LANDSCAPING. ALL PLANT MATERIALS SHALL BE MAINTAINED IN A HEALTHY AND GROWING CONDITION AS IS APPROPRIATE FOR THE SEASON OF THE YEAR. PLANT MATERIAL THAT DIES SHALL BE REPLACED WITH THE PLANT MATERIAL OF SIMILAR SIZE AND VARIETY.
7. CONTRACTOR SHALL WARRANTY PLANT MATERIAL TO REMAIN ALIVE AND HEALTHY FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE. WARRANTY SHALL NOT INCLUDE DAMAGE FOR LOSS OF PLANT MATERIAL DUE TO NATURAL CAUSES, ACTS OF VANDALISM OR NEGLIGENCE ON THE PART OF THE OWNER.
8. ALL LANDSCAPE BED AREAS TO BE PREPARED USING "READY" TO PLANT BEDDING MIX" BY "BCI BUILDING SOLUTIONS (OR APPROVED EQUAL). INSTALL TO DEPTHS PER PLANTING DETAILS (12" DEPTH MIN.). FINISHED GRADES OF PLANTING BEDS TO BE 2" BELOW FINISHED GRADE OF ADJACENT PAVING OR AS SHOWN ON GRADING PLAN.
9. TOPSOIL SHALL BE NATURAL, FRIABLE, FERTILE, pH RANGE OF 5.5-7.4, AND FREE OF TRASH, DEBRIS, STONES, WEEDS, AND TWIGS/BRANCHES.
10. ALL TREES TO BE PLACED A MINIMUM OF 4' FROM ANY UTILITY.

MAINTENANCE NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING UNTIL FINAL ACCEPTANCE.
2. ALL REQUIRED LANDSCAPING SHALL BE MAINTAINED IN A NEAT AND ORDERLY MANNER AT ALL TIMES. THE WORK SHALL INCLUDE, BUT NOT TO BE LIMITED TO, MOWING, EDGING, PRUNING, FERTILIZING, WATERING, WEEDING, AND OTHER SUCH ACTIVITIES COMMON TO THE MAINTENANCE OF LANDSCAPING.
3. ALL PLANT MATERIALS SHALL BE MAINTAINED IN A HEALTHY AND GROWING CONDITION AS IS APPROPRIATE FOR THE SEASON OF THE YEAR. PLANT MATERIAL THAT DIES SHALL BE REPLACED WITH THE PLANT MATERIAL OF SIMILAR SIZE AND VARIETY.
4. NO MOWING WILL BE ALLOWED IN UPLAND HABITAT OR RIPARIAN AREAS.
5. ALL LITTER AND DEBRIS IS TO BE REMOVED.
6. RESTORE AREAS AS NEEDED.
7. IRRIGATE AS NEEDED.

NOTE: PLANT QUANTITIES ARE PROVIDED FOR CONVENIENCE ONLY. IN THE CASE OF A DISCREPANCY, THE DRAWING SHALL TAKE PRECEDENCE.

NOTE: PLANTS ARE SPECIFIED BY HEIGHT AND SPREAD, NOT CONTAINER SIZE. ALL PLANTINGS ARE EXPECTED TO MEET ALL SPECIFICATIONS PROVIDED.

NOTE: ALL TREES TO BE PLACED 5' FROM CENTERLINE OF CHANNEL AT MINIMUM.

1. Eastern Gamagrass
2. Switchgrass
3. Bushy Bluestem
4. Prairie Wildrye
5. Virgina Wildrye
6. Green Sprangletop
7. Indiangrass
8. Inland Sea Oats
9. Sideoats Grama
10. Plains Bristlegrass
11. Southwestern Bristlegrass
12. Florida Paspalum
13. Sand Dropseed
14. Cane Bluestem
15. Texas Cupgrass
16. White Tridens
17. Alkali Sacaton
18. Illinois Bundleflower
19. Plains Coreopsis
20. Black-Eyed Susan
21. Cutleaf Daisy
22. Patridge Pea
23. Scarlet Sage
24. Marsh Elder
25. Maximilian Sunflower
26. Lemon Mint
27. Swamp Sunflower
28. Rose Milkweed
29. Frostweed
30. Clasping Coneflower
31. Cardinal Flower
32. Pink Evening Rose

Riparian Recovery Mix

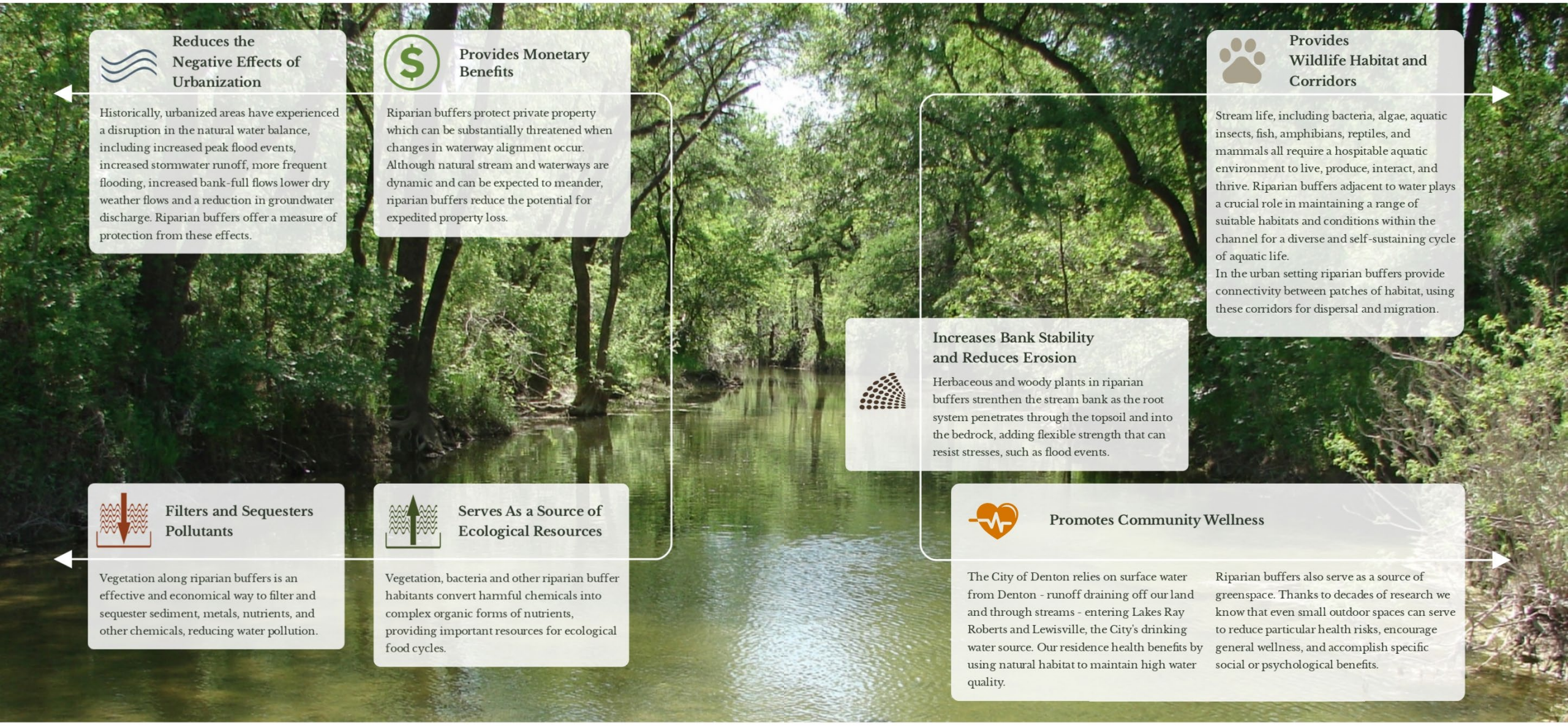
Recent Changes to the Ordinance

- The creation of an ESA Criteria Manual
- Make Tree Code and ESA regulations more compatible
- Correct discrepancies in the Official City of Denton ESA Map
- Lessen the burden on developers to when complying with other city regulations and reduce regulatory burden on small disturbances in residential infill projects
- Required preservation of Cross Timbers upland habitats non-residential development
- Criteria for approval of alternative ESA plans

ESA Criteria Manual

- Audience:
  - Developers
  - Scientists
  - Property Owners
- Technical information to support the regulation
  - Provides supporting science
  - Technical requirements to meet the code
- Guidance to develop on property with an ESA
- Guidance to create an Alternative ESA Plan
- Guidance on maintaining property with ESAs

The Many Benefits of A Healthy Riparian Buffer



Reduces the Negative Effects of Urbanization

Historically, urbanized areas have experienced a disruption in the natural water balance, including increased peak flood events, increased stormwater runoff, more frequent flooding, increased bank-full flows lower dry weather flows and a reduction in groundwater discharge. Riparian buffers offer a measure of protection from these effects.

Provides Monetary Benefits

Riparian buffers protect private property which can be substantially threatened when changes in waterway alignment occur. Although natural stream and waterways are dynamic and can be expected to meander, riparian buffers reduce the potential for expedited property loss.

Provides Wildlife Habitat and Corridors

Stream life, including bacteria, algae, aquatic insects, fish, amphibians, reptiles, and mammals all require a hospitable aquatic environment to live, produce, interact, and thrive. Riparian buffers adjacent to water plays a crucial role in maintaining a range of suitable habitats and conditions within the channel for a diverse and self-sustaining cycle of aquatic life.

In the urban setting riparian buffers provide connectivity between patches of habitat, using these corridors for dispersal and migration.

Increases Bank Stability and Reduces Erosion

Herbaceous and woody plants in riparian buffers strenthen the stream bank as the root system penetrates through the topsoil and into the bedrock, adding flexible strength that can resist stresses, such as flood events.

Filters and Sequesters Pollutants

Vegetation along riparian buffers is an effective and economical way to filter and sequester sediment, metals, nutrients, and other chemicals, reducing water pollution.

Serves As a Source of Ecological Resources

Vegetation, bacteria and other riparian buffer habitants convert harmful chemicals into complex organic forms of nutrients, providing important resources for ecological food cycles.

Promotes Community Wellness

The City of Denton relies on surface water from Denton - runoff draining off our land and through streams - entering Lakes Ray Roberts and Lewisville, the City's drinking water source. Our residence health benefits by using natural habitat to maintain high water quality.

Riparian buffers also serve as a source of greenspace. Thanks to decades of research we know that even small outdoor spaces can serve to reduce particular health risks, encourage general wellness, and accomplish specific social or psychological benefits.

Supporting Regulations and Science

- Provide references to support the City's policies
  - Detailed descriptions of the four types of ESAs
  - References to local, state and federal regulations that may need to be considered
  - Summary of the ecological services offered by ESAs
  - ESA field assessment procedures
  - Managing ESAs on private property

Guidance to Conduct ESA Field Assessments

- Identifying ESAs on the Official ESA Map
- Completing the City of Denton ESA Field Assessment Report and applying the Rapid Stream Assessment (RSAT)
  - Soils
  - Hydrologic Conditions
  - Benthics
  - Vegetative Cover
  - Physical conditions

Guidance to Meet Development Standards

- Preventing damage to the ESA during construction
  - Fencing
  - Erosion and sediment control
  - Post-construction conditions
- Building the City's Mobility Plan
- Utility installation and access for maintenance
- Floodplain fill standards
- Standards for promoting the recovery of the ESA
- Suggested guidance
  - Take credit for ESA benefits (water quality volume)
  - Avoid USACE mitigation requirements
  - Design cluster subdivisions
  - Create habitat connectivity
  - Incorporate green space and trails
  - Use educational signage

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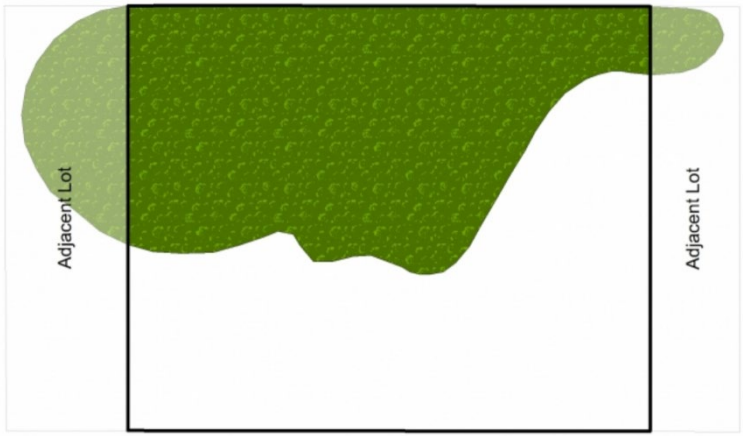
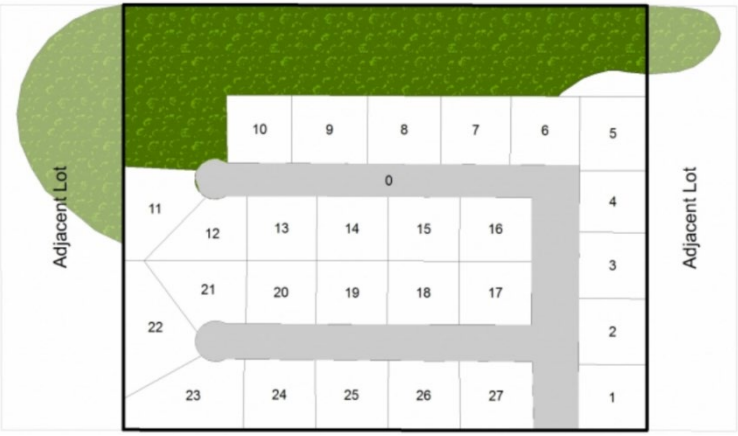
Guiding ESA Preservation

This is an ESA because there are 12 acres of original contiguous Cross Timbers Upland Habitat, although less than 10 acres are located on the subject property.



This proposed development meets the code requirement to preserve 50% of Cross Timbers Upland Habitat.

This proposed plan is preferred because it provides connectivity with habitat on adjacent properties while retaining a similar lot count, size, and habitat preservation.



Guidance for Approval of An Alternative ESA Plan

- Create, expand or improve preserved areas
  - Propose restoration to create habitat
  - Exchange one habitat preservation for another, considering the ecological benefits
- Improve encroached habitat or environment
  - Remove invasive species in remaining habitat
  - Additional pollution control features or green infrastructure (iSWM)
- Maintain habitat continuity
- Maximize public access and utilization
  - Trails in floodplain or upland habitats or in open space along the edge of riparian buffers and water-related habitats
  - Place ESAs along public viewing areas
- Preservation of the protected area in perpetuity
  - Conservation easement in a common lot
- Create a high quality development

Questions?

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