



Riparian Buffer ESA Assessment Form

Environmental Services and Sustainability

A Riparian Buffer ESA Assessment Form is to be completed for each feature identified as potentially to exist on the Official ESA Map. Additionally, any feature identified onsite that potentially has characteristics of a riparian buffer is to be identified, described and documented through this form. Features of substantially similar characteristics and location may be grouped together on one form. More information about riparian buffers and assessing this feature may be found on the [City of Denton webpage](#).

Property Address or Property ID:	Feature ID:
R	
<i>Property ID can be found through Denton Central Appraisal District</i>	<i>Provide a unique ID when multiple features are assessed</i>

Hydrologic Segment Information:

Name:	Width:	Order:
<i>When available, stream or tributary to segment name</i>	<i>Approximate stream width</i>	<i>Stream order</i>

Assessment Conclusion:

Select one of the following.

- IS an ESA. Based upon this assessment the area is a Riparian Buffer ESA. I recommend the Official ESA Map be updated to confirm the ESA designation in this area.
- NOT an ESA. Based upon this assessment the area is not a Riparian Buffer ESA. I recommend the Official ESA Map be updated to remove the ESA designation from this area.

Assessment Comments:

Provide a summary and discussion of details found in the field to support the conclusion selected above. Include a discussion of the Rapid Stream Assessment Techniques and the final verbal score (Section 5).

Attachments Provided:

Required:	<input type="checkbox"/> overall site map	<input type="checkbox"/> current map of feature	<input type="checkbox"/> proposed map of feature
	<input type="checkbox"/> soils map	<input type="checkbox"/> photographs representative of feature	
Other:			

Field Assessor:

Name of Field Assessor:
 Affiliation of Assessor (Organization):
 Date the assessment was performed:

I certify that the information provided here is an accurate description of the area(s) assessed.

Environmental Services Representative:

I concur with the description of this ESA and conclusion of this assessment.

Section 1. General Information

General Land Use:

Provide description of land hydrologically influencing feature. Select all that apply and provide more details as appropriate.

<input type="checkbox"/> Forest	Briefly describe:
<input type="checkbox"/> Agricultural:	<input type="checkbox"/> Pasture <input type="checkbox"/> Fallow <input type="checkbox"/> Crop, crop type:
<input type="checkbox"/> Residential:	<input type="checkbox"/> Low Intensity <input type="checkbox"/> High Intensity
<input type="checkbox"/> Commercial/Industrial	
<input type="checkbox"/> Recreational	
<input type="checkbox"/> Other:	

Potential pollutants from current drainage area:

<input type="checkbox"/> urban/suburban landscape maintenance	<input type="checkbox"/> urban/suburban parking lots or roads
<input type="checkbox"/> intensive agricultural use	<input type="checkbox"/> grazing animals have access to water feature
<input type="checkbox"/> water feature has steep slopes	<input type="checkbox"/> plant or animal species of concern present
<input type="checkbox"/> water feature used for recreation	<input type="checkbox"/> waterway a drinking water source/adjacent to well
<input type="checkbox"/> other:	

Proposed construction activity in the drainage area of the water feature:

- Low impact potential (parks, low density residential)
 High impact potential (high density residential, commercial development)
 Gas well plat

Benefit(s) current Riparian Buffer offers to the water feature:

<input type="checkbox"/> intercepts sediment	<input type="checkbox"/> provides fish habitat
<input type="checkbox"/> intercepts nutrients	<input type="checkbox"/> improves wildlife habitat
<input type="checkbox"/> intercepts pesticides	<input type="checkbox"/> stabilizes streambank
<input type="checkbox"/> intercepts other pollutants	<input type="checkbox"/> unique aesthetics / privacy
<input type="checkbox"/> other:	

Soil Map Unit Name(s):

Provide soil classification types where feature occurs.

Section 2. System Conditions

Stream Bank:

Evidence of frequent water level changes	<input type="checkbox"/> yes <input type="checkbox"/> no
Slope of bank	%
Soil class	<input type="checkbox"/> clay <input type="checkbox"/> sand <input type="checkbox"/> loam <input type="checkbox"/> gravel <input type="checkbox"/> ledge
Active erosion	<input type="checkbox"/> slight <input type="checkbox"/> moderate <input type="checkbox"/> severe
Existing plant cover	<input type="checkbox"/> little to none <input type="checkbox"/> moderate <input type="checkbox"/> well vegetated
Dominant cover	<input type="checkbox"/> cement <input type="checkbox"/> bare <input type="checkbox"/> grass <input type="checkbox"/> shrub <input type="checkbox"/> young forest <input type="checkbox"/> mature forest
Large leaning trees	<input type="checkbox"/> yes <input type="checkbox"/> no
Invasive exotics present	<input type="checkbox"/> yes <input type="checkbox"/> no If yes, species: _____ % infestation: _____

Top of Bank:

Existing plant cover	<input type="checkbox"/> little to none <input type="checkbox"/> moderate <input type="checkbox"/> well vegetated
Dominant cover	<input type="checkbox"/> cement <input type="checkbox"/> bare <input type="checkbox"/> grass <input type="checkbox"/> shrub <input type="checkbox"/> young forest <input type="checkbox"/> mature forest
Invasive exotics present	<input type="checkbox"/> yes <input type="checkbox"/> no If yes, species: _____ % infestation: _____

Above the Bank:

Slope	%		
Direction of slope	<input type="checkbox"/> toward the water feature	<input type="checkbox"/> away from water feature	
Runoff flow	<input type="checkbox"/> sheet flow across the land	<input type="checkbox"/> concentrated flow	
Active erosion	<input type="checkbox"/> slight	<input type="checkbox"/> moderate	<input type="checkbox"/> severe
Existing plant cover	<input type="checkbox"/> little to none	<input type="checkbox"/> moderate	<input type="checkbox"/> well vegetated
Dominant cover	<input type="checkbox"/> cement	<input type="checkbox"/> bare	<input type="checkbox"/> grass <input type="checkbox"/> shrub <input type="checkbox"/> young forest <input type="checkbox"/> mature forest
Invasive exotics present	<input type="checkbox"/> yes	<input type="checkbox"/> no	If yes, species: _____ % infestation: _____

Section 3. Brief Vegetation Survey

List all vegetative species where feature occurs for species covering >10% of the feature area and provide hydrophytic vegetation indicator of the species.

Bank:

Scientific name	Common name	% Cover	Indicator

Bank Hydrophytic Vegetation Indicator: ____ : ____

(Number of plant species that are OBL, FACW and FAC to number of plant species that are FACU and UPL)

Buffer:

Scientific name	Common name	% Cover	Indicator

Buffer Hydrophytic Vegetation Indicator: ____ : ____

(Number of plant species that are OBL, FACW and FAC to number of plant species that are FACU and UPL)

Section 4. Hydrology and Hydric Soils Indicators

Hydrology Indicators:

Primary	Secondary
<input type="checkbox"/> inundated	<input type="checkbox"/> oxidized root channels in upper 12"
<input type="checkbox"/> soil saturated in upper 12"	<input type="checkbox"/> water-stained leaves
<input type="checkbox"/> water marks	<input type="checkbox"/> county soil survey
<input type="checkbox"/> drift lines	<input type="checkbox"/> fac-neutral test
<input type="checkbox"/> sediment deposits	
<input type="checkbox"/> evidence of drainage pattern	

Comments:

Hydric Soil Indicators:

<input type="checkbox"/> histosol	<input type="checkbox"/> concretions
<input type="checkbox"/> histic epipendon	<input type="checkbox"/> high surface organic content
<input type="checkbox"/> sulfidic odor	<input type="checkbox"/> organic streaking in sandy soils
<input type="checkbox"/> aquic moisture regime	<input type="checkbox"/> listed on local hydric soil list
<input type="checkbox"/> reducing conditions	<input type="checkbox"/> listed on national hydric soil list
<input type="checkbox"/> gleyed or low chroma colors	<input type="checkbox"/> other:
Comments:	

Section 5. Rapid Stream Assessment Techniques (RSAT)

The Rapid Stream Assessment Techniques is adapted from the Texas Commission on Environmental Quality's Surface Water Quality Monitoring Procedures, Chapter 9. Physical Habitat of Aquatic Systems. To complete the RSAT provide a score for each table, as applicable. Sum Tables 1 – 6 scores and provide the average using a whole number. Complete Table 7 with these scores. Provide a total RSAT score and a verbal score. Please note, the order of tables 4 and 5 were switched at Version 5 of this form.

Table 1: Channel Stability

Indicative of hydrological flow regime alteration and general condition of physical / aquatic habitat and provides insight into the past, present, and possible future changes in stream channel morphometry.

	Score Selection:				Score
	Excellent (11 – 9)	Good (8 – 6)	Fair (5 – 3)	Poor (2 – 0)	
Stability of bank network	> 80% is stable, no evidence of bank sloughing or failure	71-80% is stable, infrequent signs of bank sloughing, slumping or failure	50-70% is stable, some signs of bank sloughing, slumping or failure	< 50% is stable, recent or frequent signs of bank sloughing, slumping	
Stream bends at study site or immediate vicinity of study site	Very stable: outer bank height is slightly above stream level, bank overhang minimal	Stable: outer bank height 2-3 ft. above stream level, bank overhang slight to moderate	Unstable: outer bank height is substantially above stream level, substantial bank overhang	Highly unstable: outer bank height significantly above stream level, overhangs large and deep.	
Exposed tree roots	Old, large, and woody exposed roots, generally 0-1 recent large tree falls / stream mile	Old and large exposed roots, some smaller young roots, 2- 3 recent large tree falls / stream mile	Young exposed tree roots are common, 4-5 recent large tree falls per stream mile	No trees exist, or young exposed tree roots are abundant, 6 or more recent large tree falls per stream mile.	
Presence of highly erosion-resistant plant/soil matrix or material in bottom 1/3 of bank	dominant	present	compromised	severely compromised or nonexistent.	
Channel crossing section shape	generally, V or U-shaped	“wide” U	generally trapezoid shaped	wide trapezoid to rectangle shape	
Table 1 score (average of points given, rounded to nearest whole number)					

Table 2: Channel Scouring and Sediment Deposition

Relates to the level of uncontrolled storm water runoff, sediment load, and transport and degradation of in-stream habitat.

	<i>Score Selection:</i>				<i>Score</i>
	<i>Excellent (8 – 7)</i>	<i>Good (6 – 5)</i>	<i>Fair (4 – 3)</i>	<i>Poor (2 – 0)</i>	
Riffle embeddedness with sand/silt	small stream order: <25% embeddedness	25 – 49%	50 – 79%	>75%	
	larger stream order: <35% embeddedness	35 – 59%	60 – 85%	>85%	
Potential for deep pools 2 ft or greater, substrate condition	High number of pools	Moderate number	Low number	Few, if any	
	Pool substrate <30% sand/silt	30-59% sand/silt	60-80% sand/silt	>80% sand/silt	
Frequency of streak marks and/or banana-shaped deposits	Absent	Uncommon	Common	Very Common	
Fresh, large sand deposits in channel and on overbank areas	Rare or absent	Uncommon, fresh localized deposits along top of low banks	Common, fresh deposits along top of low banks	Large deposits in channel and along major portion of overbank area	
Frequency and condition of point bars	Few, small, stable, and vegetated	Small and stable, well vegetated, moderate fresh sand	Large and unstable, high amount of fresh sand	Moderate to large, unstable, high amount of fresh sand	
Table 2 score (average of points given, rounded to nearest whole number)					

Table 3: Physical In-Stream Habitat

Relates to the ability of the stream to meet basic physical requirements necessary for the support of a well-balanced aquatic community (i.e., water temperature, water velocity, substrate type and quality).

	<i>Score Selection:</i>				Score
	<i>Excellent (8 – 7)</i>	<i>Good (6 – 5)</i>	<i>Fair (4 – 3)</i>	<i>Poor (2 – 0)</i>	
Percent wetted perimeter of channel bottom during base flow events	>85%	61 – 85%	40 – 60%	<40%	
Frequency of diverse habitat (riffles, runs and pools) and flow when water is present	Highly diverse habitat and flows	Good mix of habitat types and relatively diverse flows	Low diversity of habitat types, depth and flow relatively uniform	One habitat type dominates, velocity and flow uniform	
Percent of riffle composition from larger material (cobble or gravel)	>50%	49 – 25%	24 – 5%	Dominated by sand or silt	
Typical base flow riffle depth (non-stormwater base flows)	>6"	5.9 – 4.0"	3.9 – 2.0"	<2"	
Typical depth of large pools	>24"	24 – 18"	18 – 12"	<12"	
Channel alterations at study site	No evidence	Minor	Moderate	Extensive	
Summer afternoon water temperature (estimated using tree canopy coverage)	<82 degrees F	82 – 89	89 – 94	>94	
Table 3 score (average of points given, rounded to nearest whole number)					

Table 4: Riparian Habitat

Provides insight into changes in stream energetics, temperature regimes, and both aquatic and terrestrial habitat conditions.

	<i>Score Selection:</i>				Score
	<i>Excellent (7 – 6)</i>	<i>Good (5 – 4)</i>	<i>Fair (3 – 2)</i>	<i>Poor (1 – 0)</i>	
Width of forested buffer along both banks	Wide (>200 ft)	> 100 ft along major portion of both banks	Predominantly wooded, major gaps in one or both banks	Mostly non-woody vegetation with narrow riparian zones	
Canopy coverage	small stream order: >80%	79 – 65%	64 – 45%	<45%	
	large stream order: >60%	59 – 45%	44 – 30%	<30%	
Table 4 score (average of points given, rounded to nearest whole number)					

Is the water feature actively flowing?

- Yes, surface water is flowing and there are connects pools. Complete Tables 5 and 6.
- No, standing water, waterway is dry, or there are dry beds are seen between pools. Skip Tables 5 and 6.

Table 5: Water Quality

Indicative of watershed perturbations and general level of human activity, point and nonpoint source pollutant loadings, and aquatic habitat conditions.

	<i>Score Selection:</i>				Score
	<i>Excellent (8 – 7)</i>	<i>Good (6 – 5)</i>	<i>Fair (4 – 3)</i>	<i>Poor (2 – 0)</i>	
Percent substrate fouling on underside of cobble	Minimal, 0 – 10%	Light, 11 – 20%	Moderate, 21 – 50%	High, >50%	
Total Dissolved Solids	350 – 399 mg/L	400 – 449	450 – 500	>500	
Water odor	No odor	Slight organic odor	Slight – moderate organic odor	Strong organic odor	
Table 5 score (average of points given, rounded to nearest whole number)					

Table 6: Biological Indicators

Considered to be the best overall indication of stream health and the level of watershed perturbation.

	<i>Score Selection:</i>				Score
	<i>Excellent (8 – 7)</i>	<i>Good (6 – 5)</i>	<i>Fair (4 – 3)</i>	<i>Poor (2 – 0)</i>	
Macroinvertebrate community diversity	High diversity of good water quality indicator species. Few snails, leeches, aquatic worms.	Good diversity of good water quality indicator species. Mayflies and caddisflies present.	Low diversity of good water quality indicator species.	Low diversity, predominantly pollution-tolerant species.	
Number of organisms	High to moderate	Moderate	Moderate to low	Very low number	
Table 6 score (average of points given, rounded to nearest whole number)					

Table 7: RSAT Summary

	Score – flow	Score – no flow
1. Channel Stability		
2. Channel Scouring/Deposition		
3. Physical In-Stream Habitat		
4. Riparian Habitat		
5. Water Quality		
6. Biological Indicators		
Total Score:		
Verbal Score from Total Score:	<input type="checkbox"/> Excellent (42-50) <input type="checkbox"/> Good (30-41) <input type="checkbox"/> Fair (16-29) <input type="checkbox"/> Poor (<16)	<input type="checkbox"/> Excellent (29-34) <input type="checkbox"/> Good (20-28) <input type="checkbox"/> Fair (11-19) <input type="checkbox"/> Poor (<11)