

## THE OPEN SPACE PLAN

### A. THE TRAIL NETWORK: INTEGRATING PEDESTRIAN ORIENTED SPACE WITH OPEN SPACE

As open space areas are designated for the improvement of the quality of life of those residing within the community, interface between user-oriented open space (such as parks) and resource-based open space (such as watershed protection areas) should be encouraged. Trail networks provide a means of uniting these areas into an overall open space system, tying the community together through and by the natural environment that supports it.

#### Trail Network Elements

1. Create trail cross-connections between primary trails located in the creek network by:
  - a. Providing trail connections between the creek trails that connect major destinations to the system.
  - b. Providing trailheads where trail connections meet the creek trails and at other points of entry to the trail system.
  - c. Establishing the town square as a pedestrian zone and hub of the overall trail system.
  - d. Creating an east/west trail connection along the vacated railroad right-of-way south of Highway 31.
2. Locate future neighborhood and community parks in close proximity to the waterways and the trail network by:
  - a. Requiring necessary park dedications (or payment in lieu of dedication) in new development based on the number and type of residential units.

(In other words, estimate the number of people the development will support and the per capita need of parks based on Corsicana's choice of acreage to people ratio. For example, applying the current Corsicana ratio, for a residential development of 300 units (assuming 2.8 people/SF unit or 1.8/MF unit), the total acreage dedication would be 2.5 acres  $((3 \text{ acres}) \times (\# \text{ of units}) \times (\text{occupants}) \text{ divided by } 1,000)$ . Under the ULI ratio, a land dedication of 4.2 acres would be required. Developers could either dedicate this land within their development or pay a fee in lieu of park land dedication (fair market value of acreage) to the City to put towards a community park that would serve the development. A park development fee should be assessed when building permits are issued. (The City of Denton assesses a fee of \$291/SF and \$187/MF to cover the costs of

- developing the parkland dedicated by the developers.)
- b. Locating the park in close proximity to the creek system and its trail network, if the property is located close to the trail network.
- c. Requiring trailheads at park locations.

#### 3. Locate schools in close proximity to the creek trail network by:

- a. Requiring necessary school site dedications for new residential developments.
- b. Requiring that such dedications locate the school in close proximity to the creek system and its trail network.
- c. Requiring trailheads at schools.

#### 4. Create trailheads along the trail network:

- a. Locate a trailhead at the intersection of the Creek trail system and on street trails.
- b. Locate a trailhead at the above described trail cross-connections.
- c. Locate a trailhead at all schools connected to the trail network.
- d. Locate a trailhead at all parks connected to the trail network.
- e. Locate a trailhead at primary non-residential destinations, especially the town square.

### B. WATERSHED FEATURES

Corsicana boasts four creeks that flow through and about town and three lakes (two very small (Lakes Beaton and Magnolia) and one large (Lake Halbert)). These watershed features are valuable assets for Corsicana and merit enhancement and protection. The Open Space Plan attempts to respect these features by using them as the foundation of the open space framework.

Assessment of the area covered by these waterways is pertinent to the determination of land use and development. By identifying the actual amount of space involved (the length and width of the stream itself (or floodway), the 100-year floodplain, and the associated riparian habitat), Corsicana can then determine what an appropriate setback for development should be from Elm Creek, Post Oak Creek (including Town Branch and Mesquite Branch), Briar Creek, and Chambers Creek. This area defines the watershed protection area, as well as open space, that could be accessed by the community.

Below are the dimensions of the area covered by Elm Creek, Post Oak Creek (including Town Branch and Mesquite Branch), and Briar Creek, as well as the perimeters of Lake Halbert, Lake Magnolia, and Beaton Lake. (Chambers Creek is not included but, as the City grows and expands, it will eventually also require appropriate setbacks.) Stream coverage was calculated within the current city limit, as well as coverage including ETJ land. These values were taken into consideration when developing the Land Use Plan and direction of future growth.

**WATERWAYS WITHIN THE CITY OF CORSICANA**

	<b>Current City Limit</b>	<b>City Limit plus ETJ</b>
<b>Summative Length</b>	101,870'	181,400'
<b>Setback Example</b>	100'	200'
<b>Waterway Area</b>	10,187,000 sq. feet	36,280,000 sq. feet
<b>Ft/Acre</b>	43,560	43,560
<b>ACREAGE</b>	234	833
<b>Total Land Area</b>	12,946 acres	37,236 acres
<b>% Total Land Use</b>	1.8	2.2

Though the perimeters of Lake Halbert, Lake Magnolia, and Beaton Lake were summarily quantified, without further study (beyond the scope of this plan), it is difficult to identify what should be the setbacks or watershed protection areas for each of these lakes. For the table above, MESA simply used the same setbacks identified for creeks. MESA recommends that a more thorough analysis be conducted by the City to evaluate precise dimensions and attributes of not only the lakes but the waterways as well. Such a study will provide information on stream flow, erosion, associated habitat, and water quality and thus provide a good basis for setting recommended setbacks.

**C. CONCLUSION**

The natural systems found within the City of Corsicana are responsible for much of the form that the city has developed over time. The principle creeks and adjacent lakes, the soil composition, and local habitats provide not only the framework in which the City is constructed but also many of the resources (such as water) upon which the community depends. As Corsicana grows over time, progressive management of the natural resources will be necessary to ensure a healthy future for the community. As the City grows and

expands into its ETJ territory, guidelines can give form and direction for effective management of the natural systems found in and around Corsicana.

As acreage dedicated to parks is determined on a per-capita basis, these areas must be designated with future population growth in mind. Although population growth is theoretically unconstrained within a community (internal factors being the primary controllers), physical growth of a city is limited to the region of its ETJ. The build-out population therefore becomes the guideline for designating open space in the growth plan of a city.

Trails serve as an effective means of interface between open space and the community for which it has been developed. Trails also assist the merging of the Watershed Protection Plan with the Land Use Plan, as features such as parks, schools, and public facilities are vital community components that occur in the midst of designated districts. Rather than simply serving as barriers and impediments, natural systems, such as creeks and streams, become directors of movement as urban development interfaces in a constructive way with the environment in which it grows. Parks and schools gain accessibility, and natural features become available for public enjoyment and appreciation.

**PARKS AND RECREATION PLAN**

Recreational needs comprise the “user-oriented” open space found within a community. Such spaces typically include sports parks, playgrounds, and other groomed recreational areas. The amount of land designated for these purposes is based upon the population and needs of the community (is there a higher demand for soccer or baseball fields or a natatorium, for example) rather than inherent physical attributes of the land (area, natural features, etc.).

Creation of an open space framework also provides a framework for parks and recreation facilities. Recreation will become an increasingly important aspect of Corsicana: Corsicana must attract and retain younger residents (and their families) if the City is to provide the necessary employment base attractive to relocating industry. In addition, a good system of parks and recreation opportunities are:

- Important to the general health of the population.
- Key to the involvement of Corsicana’s residents in the events and life of the community.
- An opportunity for the City to celebrate special occasions and commemorate its own history.
- Critical to the effective distribution/ provision of costly facilities.

**A. PARK REQUIREMENTS**

**Existing Parks and Current Parks Requirements**

The City of Corsicana has 12 designated parks covering 379 acres. (The Beaton Lake property acquired by the City will add an additional 220 acres to the Corsicana park system. Because it is unclear how, and how much, or even when this property will be developed as park facilities, it is not included in the calculations below.) Existing parks are listed in the following table:

<b>Current Parks</b>	<b>Acreage</b>
Allyn	0.5
Bunert	24.5
Community	45.5
Cunningham-South Hill	2.75
Downtown Pocket	0.07
Jullerton-Garrity	25.5
I.O.O.F.	86
Jester	24
Lake Halbert	145
Nature	24.5
Petroleum	0.5
Water Tower	0.3
<b>Current Park Acreage</b>	<b>379.12</b>

As the need for park space is generally calculated on a per capita basis, the amount of land designated for recreational use should increase as the population increases. Based on Corsicana’s current park system and population, there is now an allotment of 14.6 acres of park land per 1,000 people in the community. However, Corsicana’s current park acreage to people ratio is far below the Urban Land Institute’s (ULI) national guideline of 25.5 acres per 1,000 people. If Corsicana were to meet the national guideline today, with its current population of 26,014, it would need to add 284 acres to its current system. (The city-owned potential park area at Lake Beaton, if developed as a regional park, would almost off-set this deficit.)

The ratio Corsicana chooses for future park facilities planning should be well-considered. The quantity and quality of park and recreation facilities are often used as an indicator not only by individuals deciding where to live but by corporations determining whether a community can provide a large employee base (or absorb a transfer of employees) and related family needs.

**Park Requirements by Type of Park**

The classification of parks and recreational areas provide a valuable guideline in maintaining proportionate user-oriented space within the city while providing for variation in the designation of that space. Where neighborhood and community parks tend to be smaller in size, adjacent to schools (sometimes with shared facilities such as tracks and gyms), and contain primarily play areas, regional parks tend to contain elements such as trail networks, boating ramps, and camping areas. General descriptions of the three main types of parks are described below:

1. **Neighborhood Parks:** Recreation areas containing picnic facilities, non-regulation playfields, playgrounds, open land, and/ or full or partial play courts. Neighborhood parks can vary in size from about 5 to 15 acres.
  - a. Locate neighborhood parks within one-half mile of the population served. Connect to the local trail/ pedestrian network.
2. **Community Parks:** Recreation areas containing picnic facilities, regulation playfields/ play courts, playground, and open land. Community parks can vary in size from about 40 to 100 acres.
  - a. Locate community parks within two miles of the population served. Community Parks may combine with school facilities (gyms, natatoriums, tracks, tennis courts, etc.).
  - b. Connect to the trail network and locate in close proximity to the floodplain.
3. **Regional Parks:** Recreational and natural areas whose primary purpose is to make public space available to nature activities and education. Such activities include hiking, camping, observing, biking, outdoor theaters and events, and environmental education. Regional parks can vary from 100 to 1,000 acres or more.
  - a. Locate regional parks within 10 miles of the populations served.

- b. Connect to the trail network and any available mass transportation.

If Corsicana should choose to apply the ULI national guideline for its future park planning efforts, it will need to ultimately acquire an additional 1,563 acres to meet the projected build-out population of 76,129 in 2036. (Far more – about 8,600 acres – would be needed for the projected ETJ build-out of nearly 339,000 people.) Applying these national guidelines to each type of park for Corsicana, **land dedication at build-out:**

**ULI: NATIONAL GUIDELINE**

Park Type	Acres per 1000 population	City Limit Build Out	Development Area Build Out (ETJ)
Neighborhood	5	381 acres	1,695 acres
Community	5.5	419 acres	1,865 acres
Regional	15.0	1,142 acres	5,085 acres
Total	25.5	1,942 acres	8,645 acres

**CORSICANA CURRENT (2006) GUIDELINE**

Park Type	Acres per 1000 population	City Limit Build Out	Development Area Build Out (ETJ)
Neighborhood	3	228 acres	1,017 acres
Community	3	228 acres	1,017 acres
Regional	8.6	655 acres	2,915 acres
Total	14.6	1,111 acres	4,949 acres

Though the ULI recommendations require a much more significant effort (under the City’s current ratio, the City would only need to acquire 732 acres within the city limits and about 4,500 acres in the ETJ), Corsicana’s future may call for such an effort.

In terms of land use planning, it is economically advantageous to try and identify future parks and the associated timeline (CIP) for acquiring the space for future parks and parks facilities. (For example, the Beaton Lake property provides an excellent opportunity to develop a regional park in the future.) We have identified, based on current open space, future trail networks, and the Watershed Protection Plan, several possible locations for future parks. These sites do not indicate size or type of park but rather just a potential location. The charts below show an average size of each park type and the number of parks needed to meet the national guideline as well as Corsicana’s current guideline **at build-out.**

**ULI: NATIONAL GUIDELINE**

Park Type	Desirable Park Acreage	Number of Parks, City Limit	Number of Parks, Within ETJ Area
Neighborhood	10	11	51
Community	30	19	85
Regional	200+	9	25

**CORSICANA STANDARD**

Park Type	Desirable Park Acreage	Number of Parks, City Limit	Number of Parks, Within ETJ Area
Neighborhood	10	10	43
Community	30	11	50
Regional	200+	3	16

## **B. DEVELOPMENT DEDICATION STANDARDS FOR PARKS AND OPEN SPACE**

Before Corsicana can embark on a Parks and Recreation Master Plan, it will be necessary to determine how much acreage should be set aside as the community grows. At a minimum, developers of residential areas should dedicate adequate open space within their developments and/or related to a regional park for the enjoyment of those who reside in that neighborhood. Before drafting such a requirement, the acreage to people ratio will need to be determined. Development standards assist in the allotment of such space, ensuring that the open space within the city meets the needs of the community. It is therefore recommended that residential development standards be created that require the preservation of sufficient open space for future parks.

Park dedications (or payment in lieu of dedication) for new residential developments should be based on the proposed number and type of residential units. At the time the development is platted, the land dedication should be made. The amount of land to be dedicated should consider the number of people the development will support and the per capita need of parks based on Corsicana's choice of acreage to people ratio. For example, applying the current Corsicana ratio, for a residential development of 300 units (assuming 2.8 people/SF unit or 1.8/MF unit), the total acreage dedication for SF would be 2.5 acres  $((3 \text{ acres}) \times (\# \text{ of units}) \times (\text{occupants}) \text{ divided by } 1,000)$ . Under the ULI national guideline ratio, a land dedication of 4.2 acres would be required. Developers could either dedicate this land within their development or pay a fee in lieu of park land dedication (fair market value of acreage) to the City to put towards a community park that would serve the development. When building permits are issued for each of the units, a park development fee should be assessed. Land dedication (or fees in lieu of) work well to acquire park land but will not cover the costs of actually developing the park. For example, the City of Denton assesses a fee of \$291/SF and \$187/MF to cover the costs of developing the parkland dedicated by the developers.

## **C. REGIONAL PARK RECOMMENDATIONS**

The above described dedications and fees can only apply to neighborhood and community parks. Such a standard cannot be used to fund regional parks which support the entire community. Due to current land use designations and future plans for the area surrounding Lake Halbert, it is recommended that the City create a regional park in the area north of the Lake and south of the landfill as indicated on the Open Space Plan map. The land already acquired for Lake Beaton provides an excellent opportunity for a second regional park. Corsicana has the potential to develop two regional parks in the near future. These parks would be beneficial to the City in several ways. They would serve the community as recreational destinations, conserve the natural landscape around the lakes, and create a buffer between the public infrastructure facilities/industrial uses and nearby residential development.

## THE WATERSHED PROTECTION PLAN

Corsicana's historical development patterns have created a difficult environmental challenge. The Courthouse was sited on high ground with the idea that the town would develop around it; the railroad was later offered the cheaper, less desirable floodplain land at the bottom of the hill. As the railroad developed this area, impervious surfaces increased and, consequently, so did flooding. Commercial businesses abandoned the high ground of the Courthouse to take advantage of the commercial connection of the railroad, adding yet more impervious surfaces and structures to an already stressed and sensitive area. Unlike the foresight afforded the Courthouse's location on high ground, Corsicana's commercial district developed on the low ground at the confluence of the increased run-off from the upstream development. Flooding of the commercial district was inevitable. Given the existing challenge of detention and run-off, it is imperative not to further exacerbate the problem by increasing impervious surfaces and restriction of flows in areas without detention capabilities.

As the City of Corsicana continues to develop while at the same time tries to preserve its distinctive identity, Corsicana's environment becomes increasingly important. The growth projections presented in the Land Use Plan carry additional implications for the community in regard to water quality and water quantity; the impacts on drainage systems and natural systems will be significant. The watershed protection component of this Master Plan provides an overview of Corsicana's watershed and sub-watersheds and suggests steps to protect the valuable resources associated with these systems.

### A. CORSICANA'S WATERSHED

#### I. Creeks and Water-ways

The distinct creek and water-way network that shaped Corsicana in its earliest days of settlement has, through the course of City development, been contained/ encroached/ constrained by a grid system that neither recognized its importance nor its particular form. The particular landscape in which Corsicana resides is one shaped and dominated by four primary creek basins. These are:

- Post Oak Creek
- Chambers Creek
- Briar Creek
- Elm Creek

Specifically, Corsicana is situated at the western edge of that point where the four creeks merge. These creeks and the drainage system they define are dynamic elements that have shaped the form of the landscape in which Corsicana resides. By analyzing each of the creeks, the relationship between place and environment is revealed.

The confluence of these waterways constrains development east of Interstate 45 and has historically encouraged development west of Interstate 45. Although the City is located in an environment of relative hydrologic complexity, Corsicana has sought to extend itself through a development form (grid system) that is least able to accommodate natural corridors. As a result, the process of city development has competed with the process of natural drainage, leading to progressive constriction and loss of important complexity. Today, the burden upon downstream restrictions has made older parts of Corsicana prone to frequent flooding. Failure to restore operations of the system will exacerbate the flooding problems and increasingly limit future growth and development.

#### Post Oak Creek

Post Oak Creek is the main creek branch around which Corsicana developed. This creek and its tributaries (Town Branch and Mesquite Branch) circumscribe the downtown area and much of its adjacent industrial zone. This is a primary water-way with a complex system of tributaries against which Corsicana has historically endeavored to impose its urban grid. Post Oak Creek offers a special connection between Richland Chambers and the Historic Downtown Core of Corsicana. Through this association revitalization potential for the core is enhanced.

The main channel and its bank area are comprised of Gowen series soils (in particular Gowen fine sandy loam). This is an alluvial soil typical of creek channels in this area that has been deposited by periodic flooding (usually every 4 to 10 years). However, due to grid development, flood conditions in Corsicana are experienced much more frequently (typically every year). When the incidence of flooding is greatly increased, the limits of the flood area are typically expanded and the high water zone begins to encroach upon soil types that are not typical of flood conditions. Post Oak Creek's increased flooding indicates the level to which normal operations of this creek have been compromised by development. In the Post Oak Creek channel, the flood areas now include soils found in the Crockett Series. These soil types generally support pasture and grassland (as opposed to riparian tree communities) and are susceptible to erosion. With the expansion of high water zones into these areas, the aspects of conflict between built fabric and environment begin to emerge. These are:

- **Increased Volume:** Because the historic beginning of Corsicana was located in the downstream portions of Post Oak Creek and (due to convergence with other creeks east of that beginning) Corsicana has grown up-stream (west of that point), new development places greater burden upon the channel defined by older development. Increased development means increased run-off; increased run-off means an increased volume that the creek channel must somehow accommodate. Even if new development forces preserve predevelopment flow rates

through detention, the volume of water attains its maximum flow under predevelopment conditions and maintains that maximum flow for extended periods of time. This extends the duration of flood conditions downstream.

- **Increased Velocity:** Because the historic grid system crosses the creek channel at many points with undersized cross drainage structures (bridges and culverts) focusing broader flows into more directed pipe flows, the velocity of water movement is greatly increased. Increased velocity releases the erosion potential of water. Combined with upland erodible soils, increased sedimentation of streams and lakes becomes problematic.
- **Increased Restriction:** A consistent pattern of allowing the creek channel to be privatized by individual property owners has resulted in a development/ creek relationship where the creek channel is a “back yard” condition. As such, it is an attractive place to site storage sheds, build children’s forts, deposit debris (yard trimmings), and store unwanted building materials. The collection of refuse in the channel creates greater restriction to water’s movement and further contributes to both loss of valley storage and enlargement of the flood area.

As a result of increased volume, increased velocity, and increased restriction, movement of the high water level into areas comprised of Crockett Series soils associated with the Post Oak Creek area creates a condition of increased erosion and sedimentation.

### **Briar Creek**

As 5<sup>th</sup> Street (coming east out of the business core) crosses Interstate 45, it traverses the drainage divide between Post Oak Creek and Briar Creek (north of Post Oak). Both of these creeks are tributaries to Chambers Creek. This drainage divide high ground is composed of primarily Wilson Clay Loam and Burlinson Clay Loam soils. Both are generally level, clay soils that typically occupy the head of drainage ways. The configuration of landforms (as defined by the direction of creek flow) aligns land forms east of Interstate 45 in a generally east to west direction, thereby making the parcels assembled conducive to development laid out along arterials that generally run east to west. By comparison, drainage patterns to the north and east of downtown run in a northeast to southwest direction, almost perpendicular to the direction of growth. As a result, development in the northwest direction will encounter more complicated landscape and, thereby, higher development cost. Growth to the southwest or south is limited by the jurisdictional limits of Retreat and Oak Valley.

### **Elm Creek**

Elm Creek and the Mesquite Branch of Post Oak Creek circumscribe that sector of Corsicana where most of the industrial development and zoning is located. Proper recognition of the natural corridors in this context provides needed transition between residential and non-residential land uses. It appears to be the pattern of Corsicana that high ground points define the location of land use aggregations. For example, downtown Corsicana is located on the high ground between Post Oak Creek and Town Branch, industrial uses are found primarily on the high ground between Mesquite Branch and Elm Creek, and northern residential communities are found along the railroad track that traverses the high ground between Post Oak Creek and Briar Creek. The only component of Corsicana’s city fabric that does not conform to this pattern is the older residential areas confined by the historic grid to lower elevations that experience frequent flooding.

The containment of most industrial development to the high ground between Elm Creek and Mesquite Branch means that the area west of Lake Halbert are dedicated to industrial use. This is immediately adjacent to Corsicana’s primary recreational park. Such a relationship is ultimately beneficial to both the lake and the emerging industrial center west of it, because parks in proximity to employment-related open space, along with trails along creek-ways, can link neighborhoods to work places. Therefore, Elm Creek is an important component of a city-wide open space/ trail system that ties high-ground land use clusters together. For such a system to fully work, Corsicana’s entire creek system must be included.

### **Chambers Creek**

Chambers Creek collects all of the water flow from Corsicana; Post Oak Creek, Elm Creek, and Briar Creek flow to this primary channel and make a structural link between Richland Chambers Reservoir (Reservoir) and the City. The growing popularity of the Reservoir and the physical connection of Corsicana to it make the Reservoir and its associated growth a key aspect of Corsicana’s future development. Particular vision should be given to the treatment of these creek connections to ensure they are kept in

the public domain. By so doing, they can be made accessible to the public as parks and trail connections.

Just as the Reservoir marks the place where water flow converges, the corridors leading to the Reservoir define the place where lake development and possible future city development converge. This point of confluence is both environmentally important and important to the form of the City. Such a place of prominence deserves a special place in the fabric of Corsicana. Among the particular distinctions worthy of this prominence is a major regional park. Such an asset would benefit the City's quality of life and protect the environmental complexity of this place.

The inevitable need to recognize natural creek systems will either forge a harmonious marriage between built fabric and landscape or be the basis of an on-going conflict that will get progressively worse as development intensifies. It is the objective of the Watershed Protection Plan to treat Corsicana's natural system as a framework for future growth that will greatly contribute to the City's quality of life and enhance its identity of place. The natural system framework becomes the open space framework (later the base for parks and recreation) and the fragile/ functionally important/ beautiful assets of Corsicana's natural environment become part of a distinctive public domain. The open space framework (discussed in detail below) is also an environmental framework and environmental purposes become an important part of its design.

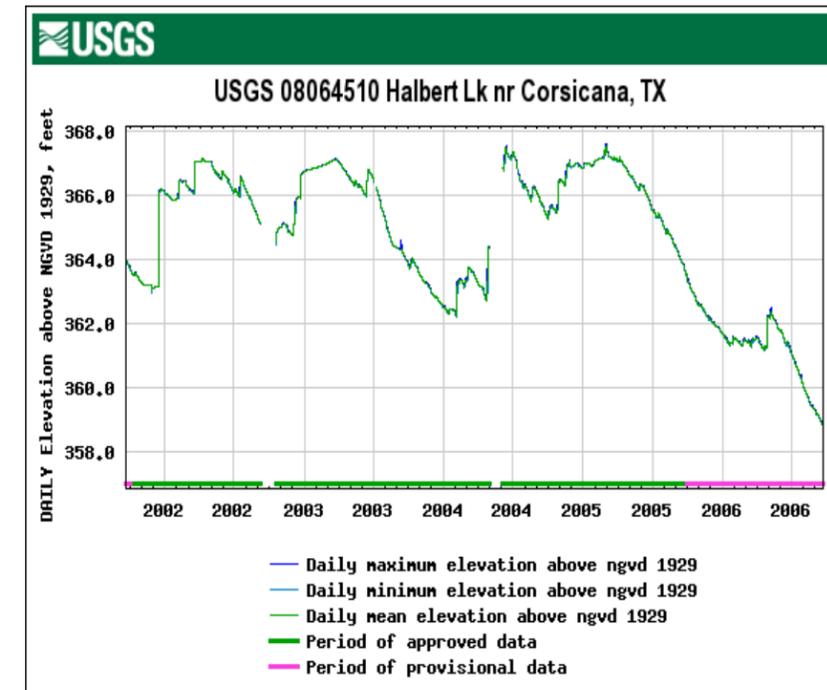
## II. Lakes

### Lake Halbert

Lake Halbert (Lake) is a multi-functional reservoir for the City of Corsicana, serving municipal, industrial, and recreational purposes. Construction began in 1920 and was completed in 1921. The spillway, at an elevation of 368 feet above mean sea level, gives the Lake a 7,420 acre-foot capacity and a total surface area of 650 acres. The drainage area above the dam is twelve square miles. The Lake is classified as cloudy to muddy in degree of clarity, and this turbid water prevents growth of submerged vegetation. Emergent vegetation is present and includes native species such as button bush, cattail, giant bulrush, and giant reed.

As one of two sources of water for the City, use of this area must reflect the role that it plays in community welfare. The combined effects of periodic drought conditions and population increase will create complex water-related issues in future years if sufficient water management plans are not created. Water levels have shown typical seasonal fluctuations but have decreased dramatically over the last year due to the current drought conditions. As of September 2006, the Lake was at 358.8 feet and only one-third full. Although a connection to Richland-Chambers Reservoir is a feasible option to increase water supply, water quality and subsequent treatment will continue to be a concern for a growing municipality.

The chart below, supplied by U.S. Geological Survey, demonstrates trends in lake levels over the past five years.



([http://waterdata.usgs.gov/tx/nwis/dv?referred\\_module=sw&format=gif&period=31&site\\_no=08064510](http://waterdata.usgs.gov/tx/nwis/dv?referred_module=sw&format=gif&period=31&site_no=08064510))

Elm Creek is the primary tributary to Lake Halbert. Therefore, the upstream industrial areas place Lake Halbert in the path of potential contamination and/or run-off pollution. Extra measures must be taken to prevent pollution and contamination. Systems of natural filtration and detention should be considered and transformed into environmental enhancements that will further transform this sector of the City into a true industrial park (park meaning natural compliments to the otherwise industrialized landscape).

Lake Halbert is part of the Elm Creek system and offers great potential for the future of Corsicana. It is a natural attractor large enough to terminate industrial development (west of the lake) and make a proper transition to residential uses (east of the lake). It will also define the edge of residential development moving east of Interstate-45 and toward Richland Chambers Reservoir. In this confluence of residential and non-residential uses, Lake Halbert is a central and transitional element. Therefore, it is also appropriate that it host significant recreational facilities and venues for the City's residential and working population.

### Lake Magnolia

Its very location in an industrial area makes this small lake all the more critical in terms of stormwater management. The lake could offer some stormwater treatment opportunities as well as continue to act as a detention/retention structure.

### Lake Beaton

Lake Beaton has been acquired by the City and, though very low on water, it can play a critical role in future detention needs as well as provide habitat and open space as a retention structure. The City-owned property (220 acres) offers a tremendous opportunity to develop a regional park in the area.

## III. Soils

The hydrologic setting in which Corsicana resides imposes conditions which shape characteristic environmental dynamics. Flow of the area watershed to a point of confluence established a system of water-ways and creeks that formed the landscape one sees today. The actions of geologic events and water have created soil characteristics, elevation differentiations, and proximity to water which collectively support vegetation, wild life, and human enterprise. The soils are the environments formed by geology and water.

Therefore, developing an environmental framework from the watershed characteristics of Corsicana and Corsicana's ETJ necessitates viewing environmental characteristics according to the soil sub-districts that support/ form them. There are four general soil groups that define the natural channels. These groups are the Kaufman series, the Gowen series, Heiden Clay, and the Trinity series. More specifically, the soil classifications for the three main creeks are as follows:

1. **Kaufman Clay (Frequently Flooded):** A soil formed in alluvium and mostly found in floodplains. This soil is subject to flooding (typically once every 2 to 3 years). Water can stand in scour channels for long periods and soils can remain wet for several months.
2. **Kaufman Clay:** Nearly level soil that occupies floodplains. Run-off is slow and water stands in some areas for short periods. This soil is normally subject to flooding about once every 4 to 10 years, making it more suitable for pasture or hay production.
3. **Gowen Clay Loam (frequently flooded):** This soil typically occupies

floodplains and is normally subject to flooding about once every 2 to 3 years. Scour channels are common and water can stand in lower areas for weeks at a time.

4. **Gowen Fine Sandy Loam:** This soil type is typically found in "bottom lands" or on floodplains of major streams. Normally subject to flooding about once every 4 to 10 years, these soils are well-drained.
5. **Gowen Clay Loam:** This is a bottom land soil that is formed in alluvium. This soil is normally subject to flooding about once every 4 to 10 years.
6. **Heiden Clay (Both 1% to 3% Slopes and 3% to 5% Slopes):** This soil type is a gently sloping upland soil (typically on ridge tops) but can be found in bank conditions or long side slopes. The hazard of erosion is moderate.
7. **Trinity Clay (Frequently Flooded):** A very common floodplain soil formed in alluvium and normally subject to flooding about once every 2 to 3 years.
8. **Trinity Clay:** A common flood plain soil type with less frequency to flood there by making it more suitable to pasture or hay production.

The above typology of soil districts and their associated watersheds set the framework for the Watershed Protection Plan, because soil types indicate the nature of the creek-way and the importance of a particular area/ location to the operation of the drainage system. The general pattern of soil sequence for Corsicana creek areas is Gowen and Gowen-related soils upstream that move down-stream through Kaufman and Kaufman-related soil groups and to Trinity soils in the larger gathering floodplain. The extent to which these soil types are present in any given area is an indicator of the structural importance of a location to the overall operations of the City's drainage system. These soils and the vegetation they support act as water filtering devices, improving water quality, while at the same time slowing velocities of storm run-off and reducing further erosion. These rich, biodiverse habitats produce new soil faster than any other area. For these many reasons, these areas should be preserved to the greatest extent possible.

The higher elevations tend to contain Crockett and Burleson series soils that are broad, relatively flat, ideal for grazing but with a potential for erosion that ranges from moderate to severe if significantly disturbed. The primary differentiation between areas of development is the nature of water activity and the type of soils formed under those conditions. These higher elevation soils are not meant to be subjected to frequent flooding and high-water flows. They are far more favorable for development than the soils associated with creeks and floodplains.

#### IV. Associated Habitat and Detention Facilities

The system of natural drainage and the amount of flow it accommodates sets up a pattern of vegetative communities adapted to the hydration level, drain ability, depth, and salinity of the soil created by the alluvial process. These vegetative communities are the distinctive characteristic of Corsicana's lower elevations and offer a sharp green contrast to grassy ridges. This contrast is the mystique of this landscape and a quality to be preserved in the Watershed Protection Plan and the Open Space Plan.

Continued development of the native landscape (and the resulting increase in impervious surfaces) will increase surface water runoff into the creek system necessitating the use of detention structures. Such structures may need to be located in the floodway of up-stream creeks to control the down-stream impacts and to prevent further flooding. However, the effect of this type of detention will be to expand the duration of peak pre-development flows thereby amplifying the effects of increased precipitation frequency.

Depending on the extent to which in-line detention permits soil transport in the run-off flow, soil characteristics within the lower elevations, low terraces, fans, and floodplain will possibly spread over a larger area as will the vegetative communities associated with them. Recently introduced non-native plant species (particularly grasses) in the floodplain system may flourish under these expanded alluvial conditions, thereby changing the nature of the landscape and habitat within them. Poor design construction of in-line detention facilities may also potentially break the continuity of the creek system (depending on the design) and disrupt wildlife movement within that system as well as disrupt pedestrian trail flow from point of origin to destination.

Though in-line detention systems may not be avoidable, they should be carefully designed to minimize any negative impact on the open space related to the floodplains. Protection of native plant species, maintenance of system continuity, and identification of the post-development high-water level should be accomplished in response to the Watershed Protection Plan.

#### B. WATERSHED PRESERVATION/RESTORATION RECOMMENDATIONS

##### • Remaining Undisturbed Creeks and Waterways

Where the creek system is still in its natural condition, that condition should be preserved through a setback from the floodway that:

- Recognizes the post-development high-water level,
- Documents the specific alignment/ location of the floodplain that should be preserved,

- Requires a creek setback that maintains the entire width of the natural condition and its characteristic vegetation, and
- Requires public dedication of the primary creek network within any future development.

##### • Revegetation of the Disturbed Creeks

Where a creek has been reconfigured and replanted, but is still an open, earthen channel, qualities of the natural creek should be restored. At a minimum:

- Restore the slope complexity of the side channel by artful sculpting of the channel profile to mimic, to the greatest extent possible, the original, natural channel, and
- Revegetate channel and associated riparian habitat with a plant palette that is derived from the vegetative communities typical of the original, natural undisturbed riparian habitat.

##### • Naturalization and Pedestrian Access for Channelized Creeks

Where a creek has been rebuilt as a concrete flume or straight earthen channel, measures should be taken to create a naturalized edge that visually softens the constructed section and creates transitions from the natural habitat to the concrete channel adjacent to it. This can be accomplished by instituting all of the following:

- Establishing a planted edge that mitigates the severity of the channel. This planted edge should be incorporated into any proposed new development and combined with dedicated public space outside the channel.
- Provision of thematic trail signage and way-finding markers that are part of a system-wide pedestrian trail design.
- For any natural sections of the creek that are targeted for future channeling, design the channel so that it more accurately depicts the natural aspects of the creek channel profile.
- Create a transition between the natural or naturalized channel and the reconstructed channel that gives a sense of natural transition.

##### • Restoration of the Creek System Transport Function

- Require detention for private development (preferably to a regional detention facility as opposed to on-site and individual small, inefficient on-site systems) that will maintain pre-development flows to the creek.

Discourage and limit in-line detention and encourage detention outside the floodplain except where necessary to correct current flood conditions.

- For in-line detention structures, design detention dam/ weir structures that permit "flow-through" of sediment transported in stormwater run-off.
- Encourage surface water management designs (instead of underground piped

systems) that will contribute to/ compliment the water transport function of creeks.

- **Creation of a Confluence Point Nature Center and Regional Park**

- Restore and preserve sections of the creek system at its major point of confluence as a regional park.

Establish trail connections between the creeks and the regional park.

- Provide interpretative trails and interpretative pavilions that allow community gatherings and engagement with the complex environment of the floodplain without disturbing it.

- **Preservation of Landmark Landforms Program**

- Identify and inventory key landforms that are community landmarks for Corsicana and/ or defining natural elements of its distinctive landscape and/ or relate to significant cultural events in the history of the City.
- Establish a preservation program for the protection of these landforms that includes:
  - i. Designation of landmark landforms,
  - ii. Formulation of guidelines for development in close proximity to such landforms, and
  - iii. A process for review of development proposals that may otherwise threaten the land forms.

- **Protection for the Edges of Sensitive Soil Zones**

- Establish preservation guidelines within sensitive soil zones (especially the Gowen, Kaufman, and Trinity groups) and the habitat areas associated with them.
- Establish limitation on augmentation of the natural condition in these areas.

