

APPENDIX I

RECREATION

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RECREATION AND OPEN SPACE

EXISTING RECREATIONAL RESOURCES

Regional Recreation Resources

The 1990 Texas Outdoor Recreation Plan (TORP) prepared by the Texas Parks and Wildlife Department (TPWD) identifies existing recreational facilities, usage trends, and projected recreational needs for 23 regions within the state. The Dallas Floodway Extension is located within a 16 county area designated in the TORP as Region 4 (see Figure 1).

Region 4 has experienced several years of rapid population growth. With 336.6 people per square mile, the density of Region 4 is surpassed only by the Houston region. Many of the small towns and rural areas within Region 4 have become part of the rapidly expanding metropolitan area as people have moved from the heavily populated cities to the suburbs. People in these urbanizing areas are finding open space increasingly scarce. The region now ranks 21st out of 23 regions in recreation land per thousand population.

Residents of Region 4 are generally worse off than the state as a whole in recreational facility supply. Of 19 commonly used facilities or designated resources, 13 have a below average supply. The supply of baseball fields, swimming pools, and campsites is among the lowest in the state in facilities per thousand population. Table 1 shows the supply of recreational land, water, and facilities managed by various providers. The administrative category with the highest proportion of park land acres (39 percent) is the aggregate of municipalities. The Corps of Engineers follows closely with 38 percent of the regional total. Much of the 48,737 acres of recreational land in this region operated by the Corps of Engineers can be found in close proximity to the urban areas. Only 9.6 percent of the park land acres found within the region is provided by the Texas Parks and Wildlife Department. State parks located within a one hour drive of the study area include Ray Roberts Lake State Park and Cedar Hill State Park at Joe Pool Lake. There are several other state parks within a two hour drive of the Metroplex. The Texas Legislature has authorized the acquisition of approximately 1500 acres along the Trinity River within the study area for a future low density recreational area to be named Trinity River State Park. Funding sources for acquisition of all of these lands, however, have not been identified.

Residents in the metroplex need not drive far to find recreational waters because many of the state's major reservoirs are located in the metropolitan area. A total of 232,581 surface acres gives the region more lake acres than all regions except Deep East Texas; however, the large numbers of people residing in the region make the suitable surface acres per thousand population still fall below the state average.

With so many reservoirs in the area, the value of the free-flowing sections of the region's rivers increases as they become more rare. Public agencies within Region 4 are taking a fresh look at the valuable natural resources along these long neglected streams. Many cities have identified linear corridor resources within their jurisdictions which are highly desirable for recreation, and sites within the Trinity River floodplain are among those most actively studied. Nine cities and three counties within the region are participating with the (NCTCOG) in the development of a *Common Vision* to protect the resources within this corridor.

Figure 1
TORP REGION 4

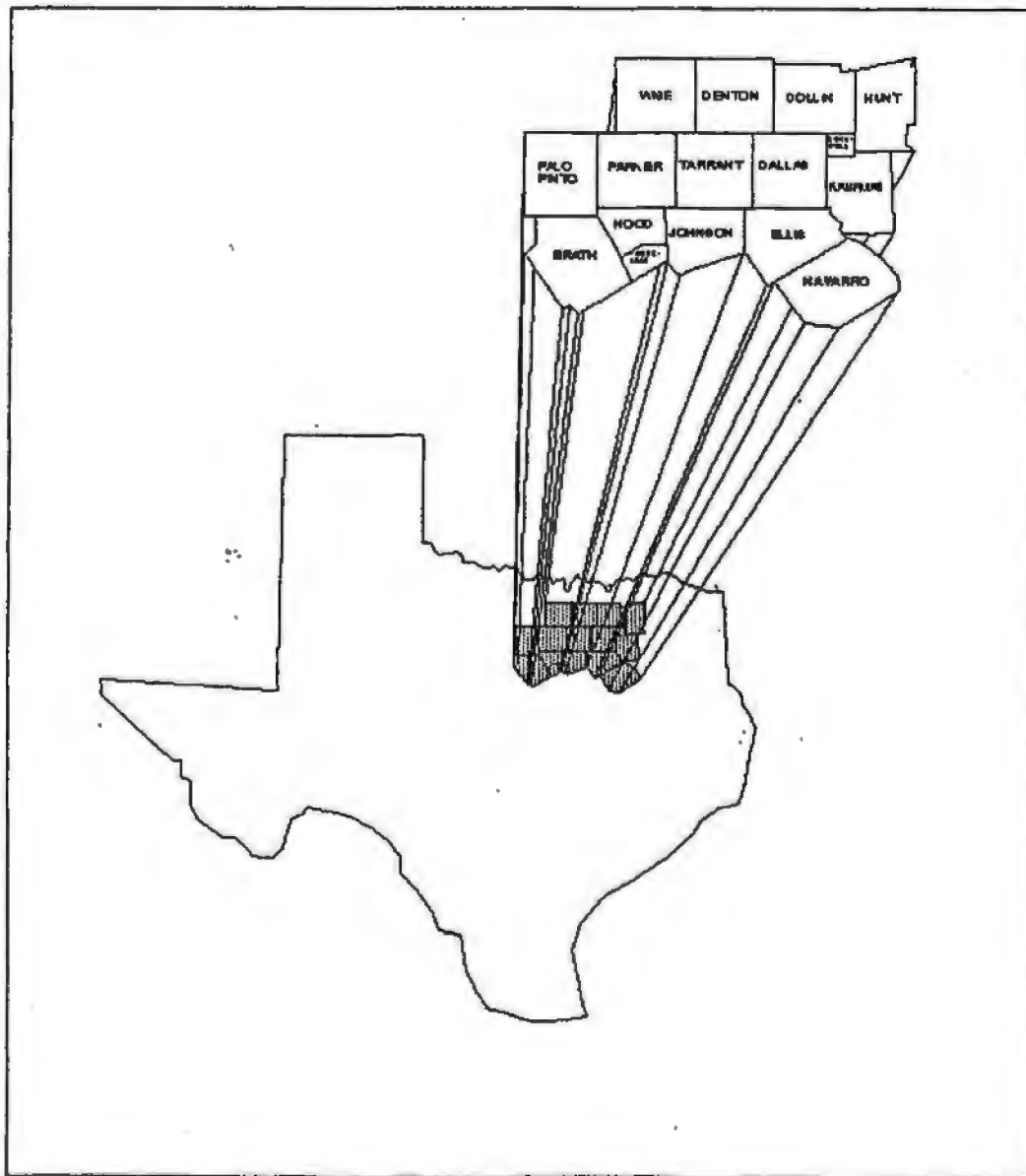


TABLE 1
Supply of Recreational Land, Water, and Facilities
Within the Upper Trinity Study Area

Facility / Resource	Forest Service	Corps of Engineers	TPWD State Park System	TPWD Wildlife Mgmt. Areas	Other State	River Authorities	Counties	Cities	Other Local	Commercial	TOTAL
Number of Parks/ Rec. Areas	1	58	10	2	3	7	11	1,218	24	120	1,454
Total Park Land (ac.)	15	48,737	12,192	6,570	190	394	560	50,160	667	8,081	127,567
Developed (ac.)	4	8,588	1,944	0	190	331	61	21,302	413	4,370	37,203
Developable (ac.)	11	6,818	6,335	0	0	63	374	19,862	211	3,352	37,026
Preserved or Unsuitable (ac.)	0	33,331	3,913	6,570	0	0	125	8,996	44	359	53,338
Baseball Fields	0	0	0	0	0	0	0	305	4	1	310
Basketball Goals	0	0	0	0	0	2	0	438	21	8	469
Boat Ramp Lanes	1	195	9	0	7	13	3	92	0	103	423
Campsites	0	1,011	405	0	0	299	62	313	0	3,303	5,393
Fishing Bank Access (yd.)	0	60,850	7,040	0	0	18,000	0	11,162	0	30,310	127,362
Fishing Structures (yd.)	0	550	212	0	0	650	0	2,703	0	4,052	8,167
Golf Holes	0	0	0	0	18	0	0	486	0	162	666
Hiking Trails (mi.)	0	0	12	0	0	0	0	11	0	0	23
Horseback Riding Trails (mi.)	0	15	9	0	0	0	0	7	0	0	31
Lake Acres (BFS Suitable)											165,749
Off-road Vehicle Area (ac.)	0	0	0	0	0	0	0	94	0	2,805	2,899
Picnic Tables	8	730	248	0	0	23	18	5,877	0	2,044	8,947
Playground Areas, Equipped	0	0	11	0	0	2	0	863	11	28	915
Soccer/Football Fields	0	0	0	0	0	0	0	553	12	0	564
Softball Fields	0	0	1	0	0	0	0	469	6	2	478
Swimming, Designated Lake (yd2)	0	142,400	3,900	0	0	150	3,000	39,500	0	200,698	389,648
Swimming, Pool (yd2)	0	0	0	0	0	0	0	78,361	0	11,775	90,136
Tennis Courts	0	0	0	0	0	1	0	826	40	10	877
Trails, Walk, Bike, Jog (mi.)	0	2	0	0	0	0	0	116	0	0	118

Source: Parks Division, TPWD, 1988. Figures are based on 1986 inventories.

Goals include the development of a regional construction permit system and cooperation in the creation of a linear greenbelt of parks and trails along and adjacent to the river and its tributaries.

Local Recreational Resources

Over 6000 acres of existing parks, open spaces, natural areas, and cemeteries are available for present or future public use within an 80 square mile section of the county that includes the study area (Figure 2). These public and private lands and facilities provide recreational opportunities for residents of the Metroplex, especially those who are unable to travel to recreational sites outside the metropolitan area.

Most of the recreational resources within the study area are owned and managed by the City of Dallas, the Dallas Independent School District, and the Dallas County Open Space Board. A list of these resources and their approximate acreages are included in Table 2.

Recreational lands and open space areas proposed for future use are also shown on Figure 2. These areas have been identified and recommended for acquisition by the City of Dallas, and the Dallas County Open Space Board in support of the comprehensive Trinity River Greenbelt concept.

TABLE 2
Trinity River Floodway Extension Landuse Acreage

Landuse Type	Number of Facilities	Approximate Acreage
Lakes	1	149
Landfills	1	2,009
Private Parks/Recreational Facilities	1	4
Golf Courses	4	627
Cemeteries	5	340
Public Parks	81	5617
Natural Parks	2	243
City Open Space	4	765
Large Outdoor Stadiums	2	33
Proposed City Parks/Open Space	16	824
Proposed State Parks/Open Space	5	1245

Regional Recreational Activities

The projected per capita outdoor recreation participation generated by Region 4 residents in each of the 26 activities shown in Table 3 closely matches the statewide figures. The exceptions are the saltwater activities, in which Region 4 residents are less likely to participate as a whole.

Table 3 also shows the activities garnering the most participation per capita. The top five activities which people do most frequently are walking, bicycling, pool swimming, playground use, and jogging. The state averages show the same top activities. Compared to the state rates per capita for the 26 activities, Region 4 residents participate at higher rates for 7 activities, at the same rate for 5 activities, and at lower rates for 14 activities. Soccer and tennis participation in Region 4 is higher than almost all other regions.

Recreation on the Trinity River and Tributaries

The most scenic wooded areas in Region 4 are often found in stream and river corridors. Scenic corridors along the Trinity, with natural meandering water courses bordered by riparian hardwoods or dense stands of trees and shrubs, are the most desirable segments of the river and the portions most intensely used by the recreating public. Use of these segments is the heaviest during higher stream flow periods, generally during the spring and fall seasons. Recreation providers have expressed concern over stream bank erosion, instream flows and the quality of the water for contact recreation. Some feel the standards for designating stream segments as fishable and swimmable should be tightened to give citizens higher quality water resources. Minimum instream flows are also needed to preserve fish and wildlife habitat and historical and recreational resources.

The Elm Fork of the Trinity River and its tributaries are currently being used for a variety of recreational activities even though access is limited or restricted. In spite of these limitations, avid canoeists, kayakers, fishermen, bicyclists, and bird watchers have located access points where park areas, roads and bridges intersect with the river.

Two of the most active canoe/kayak groups in the Metroplex are the Dallas Down River Club and North Texas River Runners. These groups have identified various Trinity and tributary segments which are currently being used for canoeing. Canoeists often put in above Interstate 30, near Trammel Crow Park, where there is a shale shelf on the east side of the river. The only existing river access point within the study area is on the west side of the river at Loop 12, which is approximately 10 river miles downstream of the Trammel Crow entry site. Under average conditions, a canoe trip between these points takes about five hours. The next take out point is where the river passes under Dowdy Ferry Road, south of Interstate 20. This is approximately eight river miles below Loop 12. Many canoeists have made the entire trip from above I-30 to the Dowdy Ferry take out, but it is a very long trip, under the best conditions. For convenience and safety reasons, it would be prudent to examine options for additional access points within the study area intermediate to these existing sites.

Representatives of area bicycle groups, including the Dallas Off-Road Bicycle Association and the Greater Dallas Bicyclists have indicated that no organized use of the floodway extension area occurs at this time. Reasons given include the lack of trail facilities in the area, and safety concerns. Riders are using trails and streets in the upper regions of the corridor and along the tributaries near the floodway extension area. They have expressed much interest in extending both surfaced and unsurfaced trails into this stretch of the greenway.

There are a number of relatively small equestrian groups who use the resources in Region 4. While they lack overall organizational unity, these groups share a common desire for more quality places to ride. Representatives of several of these groups indicate that equestrian use of the floodway extension area is limited at this time, however much interest was expressed in opportunities to include equestrian trails in future development of the area.

The Dallas Floodway Extension area is an attractive resource which provides habitat for numerous species of birds, mammals, and butterflies. According to Mr. E.G. White-Swift, president of the Dallas County Audubon Society, Lemon Lake is the area most heavily used by birders and other nature enthusiasts. Early morning hours are preferred for wildlife observation. Use of other locations within the study area is restricted by limited access and safety concerns. High water levels and muddy soils also discourage visitation.

TABLE 3
Projected 1995 per Capita Outdoor Recreation Participation
Generated by Residents of Region 4 and Texans
(in Annual User Occasions)

Activity/Facility Use	Projected Per Capita Participation Generated By		
	Residents of Region 4 in Region 4 Only	Occurring in All Regions	All Texans Statewide
Boat Ramp Lanes, FW	0.8	1.3	1.3
Boat Ramp Lanes, SW		*	0.3
Boating (Pleasure), FW	0.4	1.7	1.7
Boating (Pleasure), SW		*	0.1
Camping	0.4	1.7	1.7
Fishing, FW	1.6	2.4	2.4
Fishing from Banks	0.5	0.8	0.8
Fishing from Boats	0.7	1.1	1.1
Fishing from Structures	0.4	0.5	0.5
Fishing, SW	*	0.2	0.7
Fishing from Banks	*	*	0.3
Fishing from Boats	*	*	0.1
Fishing from Structures	*	*	0.3
Hiking	0.2	0.3	0.4
Hunting	0.4	1.1	1.3
Lake Use (BFS Suitable), FW	1.0	1.4	1.5
Nature Study	0.6	0.9	0.9
Picnicking	1.4	1.8	1.9
Swimming, FW	1.3	2.1	2.1
Swimming, SW	*	0.5	1.2
Baseball	1.2		1.5
Basketball	1.4		1.6
Bicycling	10.5		10.7
Bicycling on Trails	0.6		0.7
Football	0.7		0.8
Golf	1.4		1.3
Horseback Riding	0.8		0.8
Horseback Riding on Trails	0.2		0.2
Jogging/Running	4.8		5.4
Jogging/Running on Trails	1.5		1.7
Off-road Vehicle Riding	1.4		1.4
Off-road Vehicle Riding/Trails	0.3		0.3
Open Space Activities	3.4		3.2
Playground Use	4.9		4.8
Soccer	1.4		1.2
Softball	1.6		1.8
Swimming, Pool	6.3		6.4
Tennis	1.5		1.3
Walking (Pleasure/Exercise)		15.1	14.8
Walking on Trails	3.5		3.5

Source: 1986 Participation Survey, Parks Division, TPWD, 1987.

Notes: Asterisk (*) indicates value is less than 0.1 occasion per capita.

The Dallas Park and Recreation Department conducted a recreational user survey in the communities surrounding the Floodway Extension project area. Questionnaires were distributed to area residents through six neighborhood recreation centers. A copy of the questionnaire form is included in the back of this appendix. Centers chosen for the survey are listed below.

<i>Recreation Center Location</i>		<i>No. of Surveys Returned</i>
J.C. Phelps	3030 Tips Blvd 75216	24
Eloise Lundy	1229 Sabine 75203	18
Exline	2525 Pine St. 75215	16
Fireside	8601 Fireside 75217	27
Pemberton Hill	6424 Elam Rd. 75217	28
Rhoades Terrace	5712 Pilgrim 75215	13
Martin Luther King Jr	.2922 MLK Blvd 75215	0
Fruitdale	4408 Vandervoort 75216	0

The first part of the questionnaire provided a list of outdoor recreational activities and asked participants to indicate those activities in which they are currently participating within the project area. A tabular report of the survey findings related to existing recreational activities is shown in Table 4. The activities most often selected from the list were picnicking, hiking/walking/jogging, bicycling, and fishing. While the survey is not statistically reliable due to the method of sampling, it does provide some insight into the types of activities residents of the area enjoy.

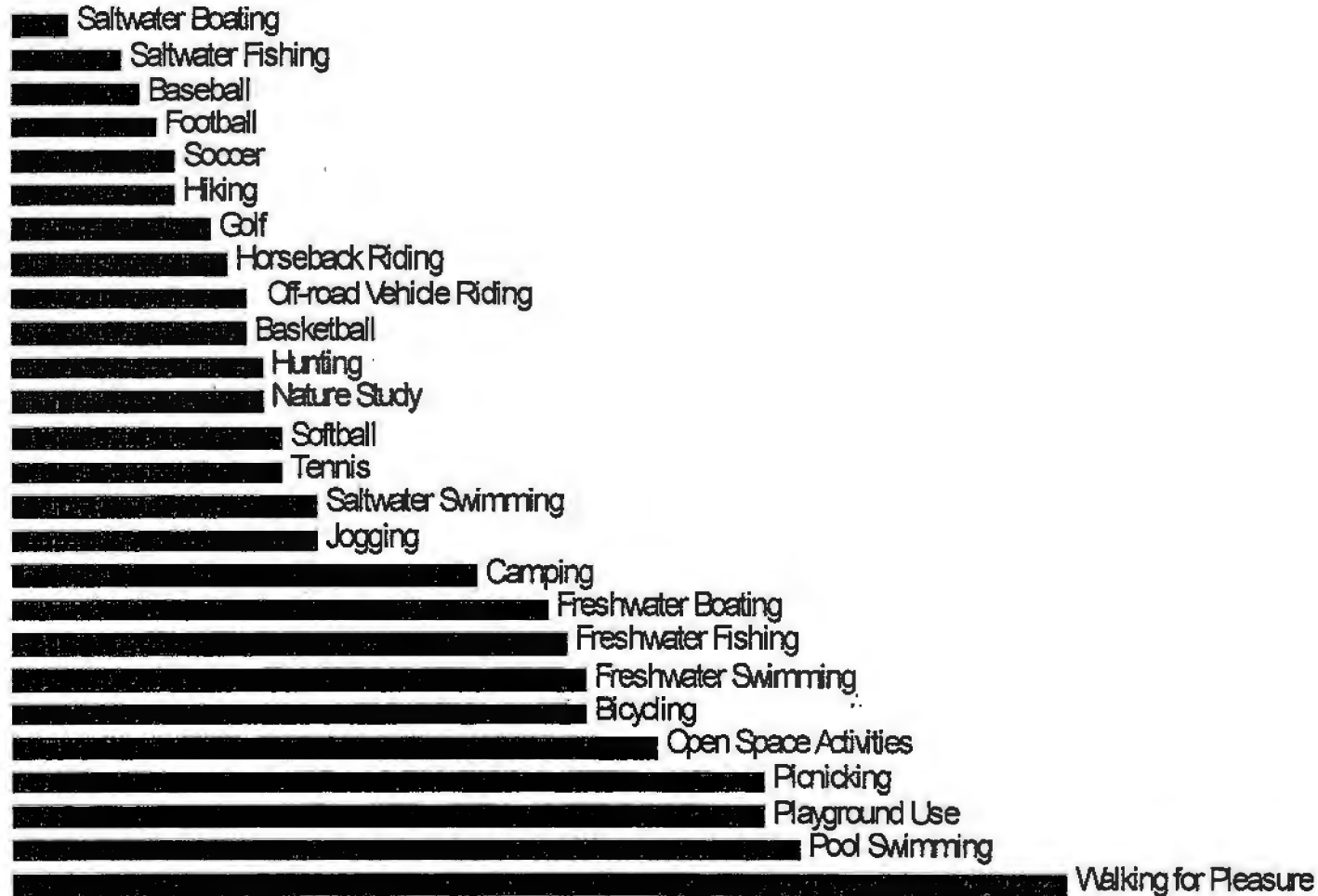
TABLE 4 Existing Recreational Use Patterns From Neighborhood User Survey							
	NEIGHBORHOOD RECREATION CENTERS						TOTALS
	EXLINE	FIRESIDE	J.C. PHELPS	LUNDY	PEMBERTON HILL	RHOADES TERRACE	
NUMBER OF SURVEYS RETURNED >	16	27	24	18	23	13	121
EXISTING ACTIVITIES							
Picnicking	1	5	15	15	23	10	69
Hiking/Walking/Jogging	0	8	16	4	20	7	55
Bicycling	1	5	10	3	22	6	47
Fishing: Riverbank	8	2	10	6	10	2	36
Other Facilities ¹	2	6	10	2	1	8	29
Horseback Riding	2	0	5	2	7	3	19
Birdwatching/Nature Study	1	0	3	3	5	2	14
Canoeing/Boating	1	1	2	2	5	2	13
Fishing: Boat	2	0	4	1	6	0	13
1. Other activities reported included Baseball, Softball, Volleyball, Water Skiing, and Badminton							

IDENTIFICATION OF RECREATIONAL NEEDS

Open space and outdoor recreational facilities which currently exist within the study area are discussed in a preceding section of this report. While there are substantial amounts of open space and recreational facilities available to the residents of the area, projections show that the demand for these facilities is continuing to increase. Table 5 and Figure 3 show the most popular outdoor recreational activities which were expected to occur in Region 4 in years 1995, and 2000,

FIGURE 3

Region 4 Projected Percentage of Population Participating



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as projected in the 1990 Texas Outdoor Recreation Plan (TORP). Participation will increase for each projection year. Fresh water fishing, swimming, and picnicking will attract the most participation in the region for resource based activities. Participation in urban oriented activities projected for 1995 were over eight times as high as the participation in resource based activities in the region. This ratio is one of the highest in Texas. Texans from outside Region 4 will have little impact on the region's resources.

Table 6 shows regional facility needs for 13 of the 18 commonly used facilities/resources by 1995. Increases of more than 100 percent over existing supply are needed for five facilities (hiking, horseback, and multi-use trails, playgrounds, and freshwater swimming areas). Table 7 ranks the outdoor recreation needs within the region. Multi-use trails are the highest need followed by freshwater swimming, playgrounds, and hiking trails.

Public recreation providers in the region have repeatedly expressed a need for more parks and passive open space. In recent years, park land and open space have become increasingly scarce as available sites have been reduced. Rapid development has replaced many natural areas with buildings and pavement. Needed lands shown in Table 6 represent only the acres required to develop recreational facilities. Most park providers have identified undeveloped land as their highest priority need (park sites, open space, and greenbelt acquisition). The next greatest need expressed is for upgrading and renovating existing facilities.

The City of Dallas and the Dallas County Open Space Board have specific plans to acquire additional lands to meet future public recreational demands. Proposed acquisitions are often dependent on the availability of public funds and are influenced by private development pressures and development permit approvals. Both the City and the County have bond funded open space acquisition programs. The recent slump in the Texas economy has temporarily suppressed rising land costs, making the present a very good time to pursue needed acquisitions.

Public Use of Rivers, Tributaries, and Corridors

As would be expected, river and creek segments which have had trees and shrubs removed, have been channelized, lined with levees, or heavily developed are less desirable and the least utilized by area canoeists, bicyclists, hikers, and bird watchers. Many of these channelized and leveed river segments offer recreation potential but will need to be enhanced with river access points, trails, play areas, sports fields, tree and shrub plantings and wildlife habitat improvements in order to attract recreational users to the floodway.

Recreational Fishing

The Texas Department of Health issued an aquatic life closure for a stretch of the Trinity River in January 1990 due to elevated levels of chlordane in fish tissue. This 66-mile stretch of the Trinity River, denoted as Segment 806, extends from Fort Worth to IH-20 in southern Dallas County, which includes the DFE project area. Fishing can be conducted, but no taking of fish is currently allowed. In addition, the TNRCC does not support contact recreation within the waters of Segment 806 due to continued water quality violations.

Trinity Corridor and Greenbelt

Without exception, the recreational master plans and sector plans of the cities and counties with jurisdiction along the Trinity River call for utilization of the flood plain for open space, linear parks, access areas, active and passive use areas, interpretive areas, natural areas, "urban wilderness" areas, and a system of linked hiking, biking and equestrian trails. A regional goal is to tie public lands and open space within the Trinity Corridor and its tributaries from Lewisville Lake, Lewisville, Coppell, Carrollton, Irving, White Rock Lake, Dallas, Grand Prairie, Mountain Creek Lake, Joe Pool Lake, Arlington, Fort Worth, Lake Worth, Benbrook Lake and other publicly owned areas.

The cities have expressed interest in exploring Federal cost sharing options for acquiring riparian forests, open fields and wetlands which border the Trinity River and its tributaries, and have encouraged the Corps to consider the full potential for cost sharing in the acquisition of natural areas and open space, and in the construction of recreational facilities in conjunction with structural and nonstructural flood protection alternatives.

TABLE 5
Projected Urban Outdoor Recreation Participation
for Region 4

<u>Activity/Facility Use</u>	<u>Projected Participation</u> <u>(in 1000's Annual User Occasions)</u>		
	<u>1990</u>	<u>1995</u>	<u>2000</u>
Baseball	4,582	4,882	5,183
Basketball	5,662	6,020	6,379
Bicycling	41,405	44,140	46,880
Bicycling on Trails	2,551	2,719	2,888
Football	2,673	2,870	3,068
Golf	5,268	5,781	6,295
Horseback Riding	3,054	3,255	3,456
Horseback Riding on Trails	784	835	887
Jogging/Running	19,073	20,055	21,039
Jogging/Running on Trails	5,875	6,177	6,480
Off-road Vehicle Riding	5,374	5,723	6,074
ORV Riding on Trails	1,053	1,121	1,190
Open Space Activities	13,358	14,076	14,794
Playground Use	19,374	20,435	21,497
Soccer	5,748	6,073	6,398
Softball	6,607	6,911	7,217
Swimming, Pool	24,685	26,216	27,749
Tennis	5,732	6,132	6,533
Walking (Pleasure/Exercise)	57,876	63,100	68,330
Walking on Trails	13,549	14,772	15,996

Source: 1986 Participation Survey, Parks Division, TPWD, 1987.

Working toward a system of parks, recreational areas, and linear trails along the Trinity is an integral portion of the North Central Texas Council of Government's *Common Vision* work program. NCTCOG has identified the Trinity River Corridor as a "unique regional resource." The value of this resource is increased because of its location within the heart of a growing Metroplex. The 100-mile long corridor encompasses the SPF flood plain of the West Fork above Eagle Mountain Lake and the Clear Fork from Benbrook to the Elm Fork, and along the Elm Fork from Lewisville Lake through the mainstem of the river, with its major tributaries, downstream to south Dallas.

While there are obviously conflicts between desires to reclaim the flood plain or preserve it, there is room within the 70,000 acres of the Corridor for both of these desires to be met. "The Trinity River Corridor is valuable to all 4 million residents of the Region and the millions to come." (NCTCOG, 1989)

The North Central Texas Council of Governments (NCTCOG) is pursuing a Trinity Greenbelt of major parks linked by a regional trail system. According to NCTCOG, "Tens of thousands of acres of open space are being preserved within the river corridor with outstanding potential for active and passive recreation. Using the Trinity River Information Network, local park departments and recreational professionals will prepare a realistic Trinity Greenbelt strategy of major parks linked by a regional trails system." It is the intent of NCTCOG to implement a "world class" Trinity Greenbelt strategy.

Local bicycle, equestrian, and conservation groups have shown a keen interest in the development of trails as part of a recreation plan for the project area. The following planning/design recommendations have been offered for consideration.

Bicycles

- Create an extended linear spine trail, at least 5-10 miles long, with shorter loops coming off of it.
- Keep the trail elevations as high as possible in the flood plain. Consider using the top and/or sides of levee for portions of the trail.
- Use American Association of State Highway and Transportation Officials (AASHTO) standards for main trail construction to minimize maintenance requirements. Consider alternative materials for loops.
- Include signage which conveys the rules of the trail system, warns of potential danger spots, and provides trail information such as mile markers, location of streets and facilities, special features, etc. Signs which display location maps would also be helpful.
- Trails should take a meandering path, rather than straight. The layout should seek to avoid blind corners and 90 degree turns.
- Parallel trails should not encourage users to cross over in front of each other. Try to avoid at-grade crossings on the main spine trail.
- Parking areas should be in secure areas, visible from the road and tied into the existing city street network. Good lighting and visibility are also necessary. Informational signage at these and other entry points are a must. Take advantage of existing parking lots in contiguous parks and commercial areas.
- The transportation value of trails should be given a high profile. Make useful connections to downtown Dallas and to residential and commercial areas. Consider nearby DART stations as access points.
- Establish discernable "gateways" into the system. Important linkages into the trail network which should be considered are:

Five Mile Creek	Parkdale at Scyene
White Rock Creek	Trinity River State Park
Riverchon Park	Lemon Lake/Joppa Preserve
The KATY trail	Woodland Springs
- Safety measures should incorporate barriers to exclude motor vehicles, 911 call boxes, and lighting in parking lots, underpasses, tunnels, etc. Trails should be farther than "bottle throwing distance" from vehicular roads.

Other recreational activities which cyclists may wish to engage in along or near the trail include picnicking, nature study, birding, and fishing. Trail amenities requested include bike racks, park benches, picnic tables (off the trail but not too far into the woods), drinking fountains (every 1 1/2 to 2 miles, just off the trail), information kiosks, and restrooms. Bicycle users indicate that they would be willing to help with the maintenance of a quality trail system, if one could be established in the study area.

TABLE 6
Additional Urban Outdoor Recreation Facilities/Resources
Needed in Region 4

<i>Facility/Resource</i>	<i>1986 Facility Supply</i>	<i>Facilities Needed Above 1986 Supply</i>		
		<i>1990</i>	<i>1995</i>	<i>2000</i>
Baseball Fields	310	24	46	68
Basketball Goals	469	214	258	301
Boat Ramp Lanes	423	*	*	*
Campsites	5,393	*	*	*
Fishing Structures, (yd.)	8,167	316	967	1,619
Golf Holes	666	*	28	89
Hiking Trail Miles	23	63	69	76
Horseback Riding Trail Miles	31	81	89	96
Lake Acres (BFS Suitable)	165,749	*	*	*
Off-Road Vehicle Riding Acres	2,899	*	*	*
Picnic Tables	8,947	*	*	*
Playground Areas, Equipped	915	930	1,031	1,133
Soccer/Football Fields	564	103	118	134
Softball Fields	478	*	16	37
Swimming, Freshwater (1000 yd ²)	390	1,029	1,100	1,170
Swimming, Pool (1000 yd ²)	90	67	77	87
Tennis Courts	877	621	726	830
Trail Miles, Multi-use (Walk, Bike, Jog)	118	263	292	322
Developed Land Acres		4,572	5,457	6,709

Source: Parks Division, TPWD, 1988.

Notes: Asterisks indicate no needs exist based on a regional analysis of supply and participation; however, needs may exist locally within the region due to inadequate distribution of existing facilities.

TABLE 7
Ranking of Outdoor Recreation Facility/Resource Needs
in Region 4 through 1995

<i>Need by Rank</i>	<i>Facility/Resource</i>
1	Trail Miles, Multi-Use (Walk, Bike, Jog)
2	Swimming, Freshwater (1000 yd ²)
3	Playground Areas, Equipped
4	Hiking Trail Miles
5	Horseback Riding Trail Miles
6	Soccer/Football Fields
7	Swimming, Pool (1000 yd ²)
8	Tennis Courts
9	Basketball Goals
10	Baseball Fields
11	Golf Holes
12	Fishing Structures, Freshwater (yd.)
13	Softball Fields
14	Boat Ramp Lanes, Freshwater
15	Campsites
16	Picnic Tables
17	Off-Road Vehicle Riding Acres
18	Lake Acres (BFS Suitable)

Source: Parks Division, TPWD, 1988.

Equestrian

- The primary concern of equestrians is the safety of their animals and equipment. Parking area security is considered very important.
- Provide at least 10 miles of trail, preferably a loop system which permits them to return to their vehicles along a different route. A system with a remote pick-up point is undesirable.
- Consider an overnight camping area. While customary amenities are desirable, the only absolute requirement would be water for the horses.
- Trails should be more primitive than bike trails. Riders prefer a mixture of spatial/visual experiences, such as narrow wooded corridors, open meadows, and high bluffs with expansive views.
- Equestrian users do not mind sharing portions of a trail corridor with other users, but would prefer separate trails within the corridor for horses. Riders could use an unpaved trail running parallel to paved surfaces.
- Access to fishing points or nature study areas along or near the trail would be a definite plus.

- Address the problem of poor communication between bicycle users and equestrians on multi-use trails. Trails with blind corners and sudden grade changes, such as the crest of a hill, especially contribute to dangerous situations. The major problem appears to be in situations where horses are startled by the unexpected appearance of cyclists approaching head-on or from the rear. Signage which conveys the rules of the trail system, warns of potential danger spots, and provides trail information such as the location of facilities, special features, etc., would play a significant part of the solution to this problem.

- With respect to creek crossings, culverts are acceptable with a 5 foot minimum width. Low water crossings are also okay if the slopes are not too steep and the surfaces do not become boggy. Footbridges are fine if they are a minimum 6 foot wide. Wood decking is okay. Bridges should have adequate signage to require that other users remain clear until horses have crossed.

- Parking areas should be designed to allow trailers to maneuver. Security of these areas is very important. Equestrian users recommend that parking areas be located at the end of regular police patrol routes, so that patrol vehicles would drive through the lots on a routine basis. Good lighting and visibility are also necessary.

Nature Study

- Access to high quality nature areas is presently a problem. High water levels and muddy soils discourage visitation. Sidewalks, boardwalks, and observation platforms would facilitate better access.

- Walking distances from parking areas to various observation locations should be as short as possible. In some instances, it may even be appropriate to observe wildlife from one's vehicle.

- Safety is a major concern for individuals and small groups. Create focal points to attract more visitors to one location. Place viewing areas in open, cleared spaces. Special events, such as annual spring walks, would help establish the worthiness of a wildlife viewing area and encourage additional visitation.

- Create small sub-impoundments and wetland areas to attract waterfowl and shore birds. To encourage the presence of butterflies, mowing along the banks should be kept to a minimum.

- Early morning hours are best suited for wildlife observation. To prevent glare from the morning sun, overlooks should be oriented to face west.

- Equestrians and conservations have also indicated their willingness to help with the maintenance of a quality trail system, if one could be established in the study area.

Neighborhood Questionnaire

The second part of the questionnaire provided a list of outdoor recreational activities and asked participants to indicate those activities which they would likely participate in if they were available within the project area. A tabular report of the survey findings related to preferred recreational activities is shown in Table 8. The activities most often selected from the list were picnic areas, athletic facilities, hiking/walking/jogging and bicycle trails, and fishing piers. While the survey is not statistically reliable due to the method of sampling, it does provide some insight into the types of activities residents of the area prefer.

RECREATION MASTER PLAN

The regional recreation master plan for the Dallas Floodway Extension is shown in Figure 4. The plan is designed to meet existing needs for passive and non-structured recreational activities within the regional service area, and addresses state and regional shortfalls in facilities for walking, hiking, cycling, and jogging identified in the TORP. Facilities proposed for this project are necessary to provide public access, protect sensitive environmental resources and promote safe use of the area. The plan creates linkages between existing recreational areas and public open space areas, both existing and necessary for the Floodway Extension project. Most access points take advantage of existing facilities within local parks and preserves. The plan is consistent with locally adopted recommendations for long range development of a "Great Trinity Forest Park" within the Floodway Extension area. Those facilities proposed for the Dallas Floodway Extension recreation master plan are highlighted in Figure 5 and described below.

Trails

Twenty-six miles of all weather hike/bike trails are proposed. Eighteen miles of trail qualify as cost sharable. These trails would be 10 ft wide concrete, with informational and directional signage and rest stops, including an 8 ft bench or picnic table at one mile intervals. All weather trails will include low water crossings, culverts, grading and drainage. Increasing the width to 12 feet, as desired by the sponsor, would be considered a betterment, and would be a 100 percent non-Federal cost.

A life-cycle cost analysis has been included in this appendix, which verifies the cost efficiency of utilizing concrete trails for the proposed trail locations.

Sixteen miles of natural surface equestrian trails are proposed, of which 8.5 miles are cost sharable. These trails would be 8 ft wide with a 15 ft overhead clearance and would have informational and directional signage and a rest stop every 3 miles, with 8 ft bench or picnic table and a hitching post. Natural surface equestrian trails would require clearing and grubbing, low water crossings, culverts, grading and drainage.

Ten miles of natural surface nature trails are proposed. Five miles are cost sharable. These trails would be 4 ft wide with 8 ft overhead clearance. They would need informational and directional signage and a rest stop with an 8 ft bench at one mile intervals. Nature trails will require clearing and grubbing, low water crossings, culverts, grading and drainage. The plan includes approximately four miles of natural surface off-road bike trails. These trails would be 4 ft wide and would be constructed by volunteers at no cost to the government.

Footbridges

Two footbridges will be required to span the Trinity River. They would need to be 10 ft wide, with 54 inch side rails, and wood decking (necessary for equestrian use), and would require signage for safe use by multiple recreation groups. These bridges would be accessible to maintenance vehicles.

Access Areas

A total of seven access areas are proposed, three of which would be located at existing parks or areas with adequate existing parking areas. These areas are located at Moore Park near Cedar Creek, at Woodland Springs Park near the McCommas Bluff Preserve, and at IH-45 near the Central Wastewater Treatment Plant. Each of these areas would need an entry sign, a 30-foot by 60-foot picnic pavilion, and a trailhead with an informational kiosk. The clubhouse at the Sleepy Hollow Golf Course is included as an access point, but would require no modifications. One of the new access areas would be located near the upstream end of the existing Rochester Park levee, with another located on the east side of the Trinity River across from Lemmon Lake, and the final

one located at the southern end of the study area near IH-20. The new access areas would require concrete entry drives and parking spaces to accommodate 20 cars each, with adequate turn-around space for busses and trailers. Each of these access areas would need an entry sign, a 30-foot by 60-foot picnic pavilion, a trailhead with an informational kiosk, security lighting, and a drinking fountain and hose bib.

EXISTING PARKS AND OPEN SPACE



Figure 1 is a line graph showing the time course of the effect of 100 mg/kg of diazepam on the plasma concentration of diazepam in rats. The y-axis is labeled "Plasma concentration (mg/ml)" and ranges from 0 to 1.0. The x-axis is labeled "Time (h)" and ranges from 0 to 10. There are two data series: one represented by open circles (○) and another by open squares (□). Both series show a peak concentration around 2 hours. The open circles series starts at approximately 0.8 mg/ml at 0 hours, peaks at about 0.9 mg/ml at 2 hours, and then declines to about 0.4 mg/ml at 10 hours. The open squares series starts at approximately 0.6 mg/ml at 0 hours, peaks at about 0.7 mg/ml at 2 hours, and then declines to about 0.3 mg/ml at 10 hours. Error bars are present for each data point.

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DALLAS FLOODWAY EXTENSION

RECREATION AND OPEN SPACE PLAN

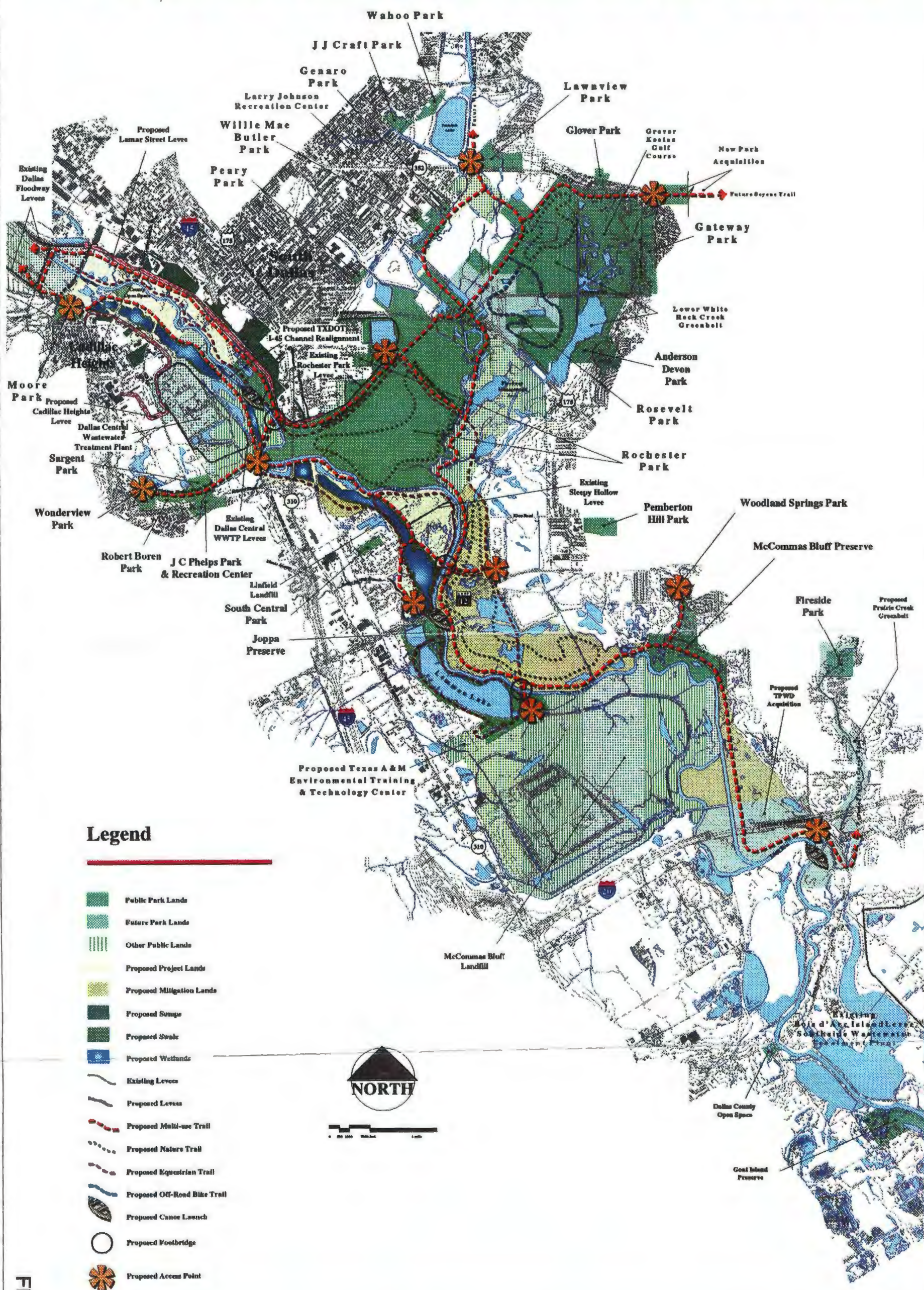


FIGURE 4

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RECREATION AND OPEN SPACE PLAN



FIGURE 5