Little Elm and Laterals Watershed of the Trinity River Watershed

Collin, Denton, and Grayson Counties, Texas

Environmental Assessment

Sponsoring Local Organizations

Collin County Soil and Water Conservation District
Denton-Wise Soil and Water Conservation District
Upper Elm-Red Soil and Water Conservation District

June 1975

Prepared by

United States Department of Agriculture
Soil Conservation Service
Temple, Texas

USDA, SOIL CONSERVATION SERVICE
ENVIRONMENTAL ASSESSMENT

Title of Assessment: Floodwater Retarding Structure Nos. 13, 14, 15, and 16; and Remaining Land Treatment Measures of the Little Elm and Laterals Watershed Project,of the Trinity River Watershed, Collin, Denton, and Grayson Counties, Texas.

Date: June 1975 Type of Action: Administrative

AUTHORITY FOR MEASURE: Prepared under the Authority of the Soil Conservat: Act of 1935 (Public Law No. 46, 74th Congress), the Flood Control Act of June 22, 1936 (Public Law No. 738, 74th Congress) and the Flood Control Ac: of December 22, 1944 (Public Law No. 534, 78th Congress 2nd Session).

SPONSORING LOCAL ORGANIZATIONS: Collin County Soil and Water Conservatio: District, Denton-Wise Soil and Water Conservation District, and the Upper Elm-Red Soil and Water Conservation District.

INTRODUCTION: This assessment covers the installation of floodwater retar: ing structure Nos. 13, 14, 15, and 16; and land treatment of the Little Elm and Laterals Watershed Project, located in Collin County, Texas (Appendix C).

A work plan was prepared on the Little Elm and Laterals in March 1957 and was approved for operations August 1957. The purpose of this watershed project is to provide flood protection to the flood plain of Little Elm Creek and its tributaries and to provide protection from erosion to the watershed lands.

The plan provides for the acceleration of the installation of land treatment measures on private lands by landowners and the installation of 23

floodwater retarding structures. To date, 80 percent of the accelerated land treatment has been applied and 16 floodwater retarding structures have been constructed. The remaining 7 structures to be constructed are in two separate hydrologic units. Three of the structures are in the Mustang Creek tributary hydrologic unit and four are in the Little Elm Creek tributary hydrologic unit. The Little Elm Creek hydrologic unit will be covered by this assessment.

The total estimated cost of installing this project is $2,492,724, of which $887,941 is federal cost and $1,604,783 is local cost. The estimate federal construction cost is $973,205. To date, federal construction cost has been $541,353 for those structural measures installed.

No accurate records of out-of-pocket expenditures by the sponsors are available. However, they have acquired about 52 percent of the land right for the remaining planned works.

This assessment will discuss only the planned action of installing floodwater retarding structure Nos. 13, 14, 15, and 16 and the remaining land treatment measures and their impacts on the environmental factors listed in Section 650.8 of the Soil Conservation Service Guidelines for Preparation of Environmental Impact Statements as published in the Federal Regist June 3, 1974. There will be no other independent parts of Little Elm and Laterals watershed considered for construction until an environmental impa statement or a negative declaration has been prepared and filed with the Council on Environmental Quality.

PLANNED PROJECT

The action being assessed is the installation of floodwater retarding structure Nos. 13, 14, 15, and 16 and the remaining land treatment measures. These are four of a total of seven structures that have not been installed to date (Appendix C).

Under the Authority of the Flood Control Act of 1944, the Soil Conservation Serivce is authorized to provide assistance to land users in the planning and application of soil, plant and water conservation measures throughout the authorized portion of the Trinity River watershed. This assistance was started in 1946 and will continue until the project is completed. The Little Elm and Laterals watershed work plan provides for acceleration of land treatment assistance on land within the Little Elm and Laterals watershed.

Conservation land treatment consists of individual measures and practices or a combination of measures and practices that are planned, installed, and maintained on privately-owned land by individuals or groups of land users. Land treatment measures planned for the watershed are those that will contribute directly to the preservation and enhancement of the environment of the watershed. Emphasis is given to those measures which w reduce soil and water losses, reduce flooding, and preserve or improve the fish and wildlife resources of the watershed. The Soil Conservation Servi field offices at McKinney, Sherman, and Denton are assisting the three Soi and Water Conservation Districts in providing land users technical assista on conservation land use programs.

Conservation land treatment has been, and will be, applied on privately-owned lands within the watershed. The land user will make the decision on the use of his land and the treatment measures which he will install for its protection and improvement.

Approximately 80 percent of the accelerated land treatment measures have been applied on the drainage areas above the four structures covered by this assessment. The land treatment goal was to have about 80 percent of the total needs on the land by the end of the project installation period. Some of the accelerated land treatment measures remaining to be completed are 40 acres of critical area planting, 275 acres of pasture planting and 8 acres of waterway establishment. In these four drainage areas, about 90 percent of the agricultural land is adequately protected by vegetative cover and/or structural measures so that excessive erosion i not occurring. Critical erosion is affecting about 80 acres of land above the four proposed dams.

The four floodwater retarding structures have a drainage area of 5,308 acres or 8.29 square miles. 1/ Pertinent data pertaining to the structu is shown on Appendix A. Figure 1 shows a typical cross section of a flood water retarding structure.

A floodwater retarding structure is composed of a dam or embankment with a principal spillway and plunge basin, an emergency spillway, a sediment pool, and a floodwater retarding pool. The dam temporarily impounds floodwater upstream in the retarding pool. The water in the retarding pool

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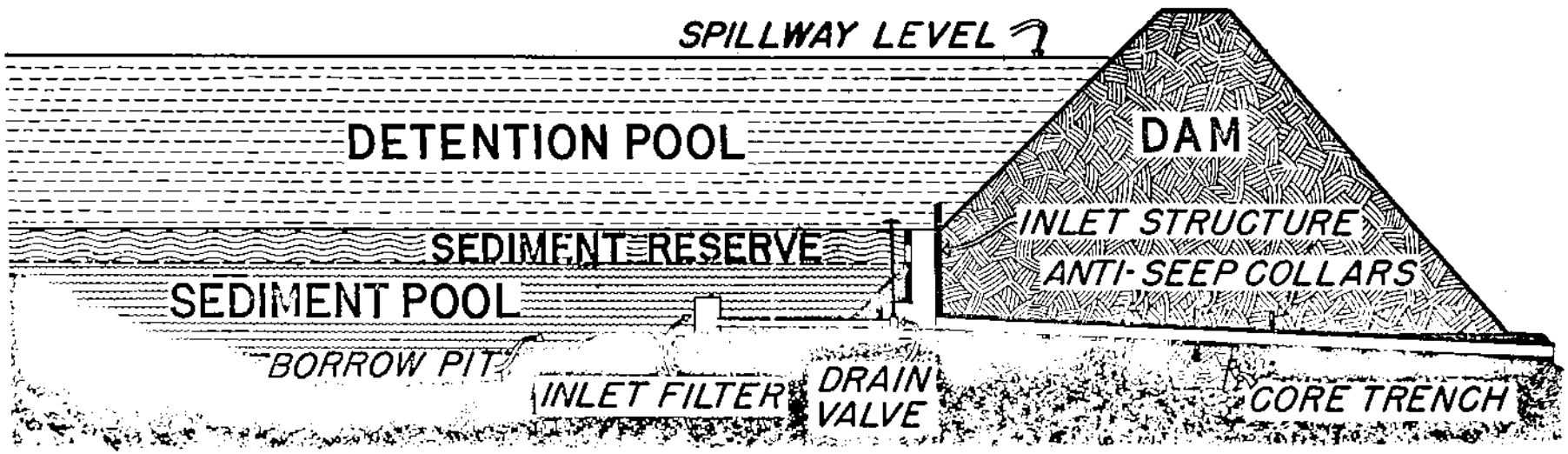
1/ All information and data, except as otherwise noted by reference to sou were taken from the work plan for Little Elm and Laterals Watershed, SCS, March 1957 or was collected in the process of preparing the environmental assessment.

UNITED STATES
DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE
FORT WORTH, TEXAS



SECTION OF A TYPICAL
FLOODWATER RETARDING STRUCTURE

flows during a period of predetermined time, through the principal spillway, which is a concrete vertical inlet and a conduit through the base of the dam. Principal spillway flow is released into a plunge basin on the downstream side of the dam. The plunge basin dissipates the energy of the principal spillway flow. The emergency spillway is designed to convey runoff that exceeds the planned capacity of the retarding pool past the embankment and back to the stream channel. The sediment pool is the capacity below the principal spillway elevation allocated for storage of sediment expected to accumulate during a 100-year period.

The installation of these structures will require the use of about 386 acr of land. The construction of the dams and emergency spillways will requir the use of about 43 acres of land. The sediment pools at the lowest ungat outlet which is also the 50-year sediment pools will require about 136 acr of land and an additional 207 acres will be used to temporarily store floo water and for sediment reserve storage. It will require about 13 to 18 days to drain the pool from the emergency spillway crest to principal spillway crest after inflow ceases depending on the individual site considered.

The following table provides individual floodwater retarding structure information:

Floodwater Retarding Structure Site Data

Site No *	Drainage Area Acres	Lowest Ungated Outlet Acres	Sediment Pool Acres	Emerg. Spillway Crest Pool Acres	Dam and Emerg. Spillway	Total Acres	No. Days to Drain Detentio Pool **
13	2,162	42	42	101	8	109	13
14	1,114	46	46	100	8	108	15
15	1,600	33	33	102	11	113	14
16	432	15	15	40	16	56	18
Total	5,308	136	136	343	43	386	-

* All information was taken from the individual land rights maps on file at the McKinney Field Office, SCS.

** Time to evacuate floodwater from the detention pool is based upon when all inflow runoff into the pool area ceases.

The total planned system of structures on the Little Elm Creek tributary is 20. To date, 16 have been completed controlling 83 percent (49.30 square miles) of the total control planned for the area. The four sites of this assessment will control the remaining 17 percent.

With all floodwater retarding structures installed, the flood plain of Lit Elm Creek above FM 455 and the tributary flood plains (1,075 acres protect below the floodwater retarding structures will be essentially flood-free f all storms up to the size that can be expected to occur no more frequently once in 15 years. The Little Elm Creek flood plain (3,250 acres protected between FM 455 and FM 1385 will experience some flooding from storms large than can be expected to occur once in five years, while below this area, a two-year frequency storm may cause out-of-bank flooding but will protect a 4,950 acres of flood plain land up to this frequency of occurrence.

Pertinent physical structure data for the floodwater retarding structures are provided in Table 3 of the Little Elm and Laterals Watershed work plan.

Installation of the structural measure will not cause the displacement or relocation of any dwelling, business, or farming operation.

The dam, emergency spillway, and areas disturbed during construction, except for the water impoundment area, will be planted with multiuse plants for erosion control and wildlife use. The embankment and emergency spillway will be vegetated with grasses such as bermudagrass, switchgrass, sideoats grama, texas wintergrass, etc. Odd areas disturbed during constr tion will be vegetated with forbs, grasses, and possibly woody plants.

Provisions have been included in the plans for the structure to drain the sediment pool if it becomes necessary.

The environment will continue to be protected from erosion and water pollu following completion of construction. Collin County Soil and Water Conser District will operate and maintain the floodwater retarding structure in accordance with a specific operation and maintenance agreement. The agree will set forth the inspections to be made and maintenance to be performed prevent soil erosion and water pollution. Sponsors have given assurance t adequate sanitary facilities meeting local and state health standards will be provided at the reservoir prior to any recreational use.

All applicable state water laws will be complied with in the design and construction of the floodwater retarding structure, as well as those pertaining to the storage, maintenance of quality, and use of water.

The environment will be protected from soil erosion and water and air pollution during construction. Contractors will be required to adhere to strict guidelines set forth in each construction contract to minimize soil erosion and water and air pollution during construction. Excavation and construction operations will be scheduled and controlled to prevent exposure of extraneous amounts of unprotected soil to erosion and the resulting translocation of sediment. Measures to control erosion will be uniquely specified at each work site and will include, as applicable, use of temporary vegetation or mulches, diversions, mechanical retardation of runoff, and traps, Harmful dust and other pollutants inherent to the construction process will be held to a minimum practical limits. Haul roads, excavation areas, and other work sites will be sprinkled with water as needed, to keep dust within tolerable limits. Contract specifications will require that fuel, lubricants, and chemicals be adequately labeled an stored safely in protected areas, and disposal at work sites will be by approved methods and procedures. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable laws, ordinances, and regulations in respect to burning. Each contract will set forth spec stipulations to prevent uncontrolled grass or brush fires. Disposal of brush and vegetation will be by burying, hauling to approved locations, or controlled burning, as applicable.

Necessary sanitary facilities, including garbage disposal facilities, will be located to prohibit such facilities being injuriously adjacent to live streams, wells, or springs in conformance with federal, state, and local water pollution control regulations. Conformance to all environmental con requirements will be monitored constantly by a construction inspector who will be on-site during all periods of construction operation.

ENVIRONMENTAL SETTING

Location and Size

The measures covered by this assessment are all located on small unnamed tributaries to Little Elm Creek in Collin County, Texas.

Little Elm Creek heads in the southern part of Grayson County about five miles northeast of Gunter. It flows south and west to enter the Garza-Little Elm Reservoir near the town of Little Elm in Denton County, Texas. The largest tributaries are Pecan and Mustang Creeks and Clarks and Hearne Branches. Laterals included in the work plan which flow directly into the reservoir are Doe Branch and Panther, Stewart and Cottonwood Creeks. The watershed has an area of 184,800 acres, nearly all of which are in farms and ranches.

Climate

The climate of Collin County is warm temperate and humid. Summers are hot. Average annual rainfall is 34.80 inches. Average annual temperature is 65 degrees and the average annual relative humidity is abou 63 percent.

Rainfall is fairly evenly distributed throughout the year, though usually the maximum occurs in April and May with the minimum in August. A large part of the annual precipitation comes in thundershowers that occasionally are heavy for brief periods. Consequently, a part of the rainfall is usua lost to the soil because runoff is rapid.

The mean annual lake evaporation is estimated at 56 inches, two-thirds of which evaporates in the warm season, May through October.

The average length of the freeze-free period is 237 days, but this period varies considerably from year to year.

Geography

The watershed is located entirely in the Blackland Prairie Land Resource Area. 2/ The overall topography is gently rolling. The watershed is characterized by nearly level and gently sloping ridges, sloping to moderately steep sideslopes, and nearly level flood plains. Slopes range from less than one percent to about 12 percent on the sideslopes. Elevati ranges from about 600 feet on the flood plain up to about 650 feet on the ridges. 3/

There are two geologic formations mapped in the watershed. 4/ The Eagle Ford formation of the Upper Cretaceous system makes up about 97 percent of the watershed. This formation consists of shales and clays of marine orig It weathers to form deep clayey soils. About 3 percent of the watershed i recent Alluvium and consists of clayey sediments washed from the surroundi Eagle Ford formation.

Soils

The soils in this subwatershed are deep, clayey soils with very slow perm bility. The shrink-swell potential, which affects engineering structures constructed on the soil, is high. The very slow permeability and clayey textures create a high erosion hazard.

2/ Texas Agricultural Experiment Station, Texas A&M University, in cooper with U. S. Department of Agriculture, Soil Conservation Service, General Soil Map of Texas, College Station, Texas, 1973.
3/ U. S. Department of the Interior, Geological Survey, Celina Quadrangle Texas, Denver, Colorado, 1960.
4/ Bureau of Economic Geology, The University of Texas, Geologic Atlas of Sherman Sheet, Austin, Texas, October 1967.

There are five soil groups in the subwatershed. Houston Black soils, 0 to 3 percent slopes make up about 67 percent of the area. These are deep, calcareous clayey soils that are moderately well drained.

Houston soils, 3 to 8 percent slopes eroded, make up about 23 percent of the subwatershed area. These are deep, calcareous clayey soils. They are well drained and show evidence of past erosion. The erosion has left shal gullies or washes 1 to 3 feet deep. Most of the erosion is not active sin the areas have been planted to improved grasses. A few areas, making up about 5 percent or about 60 acres of the Houston soils have active gullies which are contributing sediment to the flood plain.

Ferris-Houston soils, 5 to 12 percent slopes, eroded, make up about 5 percent of the soils in this subwatershed. These are deep, calcareous, well drained, clayey soils that occupy the eroded slopes. The erosion is mainl gullies 2 to 6 feet deep. Some are not crossable with farm machinery. Ab 8 percent or 20 acres have active erosion. These soils are suited mainly pastures.

Trinity soils, frequently flooded, make up about 3 percent of the area. These are deep, calcareous, somewhat poorly drained clayey soils that occu flood plains. They formed in sediments washed from the surrounding soils sloping areas. The soils flood several times per year for a period of a few days. They are not suited for cultivation because of this hazard, but have a high potential for pasture production.

Burleson and Wilson soils, 0 to 3 percent slopes, make up about 2 percent of the area. These are deep clayey soils, Burleson soils are moderately well drained, and Wilson soils are somewhat poorly drained. The soils have high shrink-swell properties. Potential use for cropland is moderate to high.

The capability class of the soils range from class II to class VI. 5/ The capability classification is the grouping of soils to show their suitability for most kinds of farming or agricultural use. The higher capability classes indicate more factors, such as erosion hazard drainage, that limit their use. The Houston Black soils are in capabili class II, Houston soils, eroded, are in capability class III and IV, Ferris-Houston clays, severely eroded, are in capability class VI, Trinity soils, frequently flooded, are in capability class V, and Burelson and Wilson soils are in capability class II and III.

Erosion has been severe on about 28 percent of the subwatershed area. This erosion has resulted in the more fertile topsoil from the hillsides being deposited in the stream flood plains. This has resulted in a reduced fertility level on these eroded soils. In the past, most of the soils in this subwatershed area were cultivated, for example, in 1930, 72 percent of the soils in the county was used for row crop production. 6/ At present, 33 percent of the land is cultivated. The less productive land has been planted to grasses, which have reduced the active erosion from the hillsides. About 1.5 percent or 80 acres of the eroded areas are considered to be active snd need special treatment to reduce soil loss and future damaging effects.

5/ USDA, Soil Conservation Service, in cooperation with Texas Agricultu Experiment Station, Soil Survey of Collin County, Texas, 1969.
6/ Beck, M. W. and Fitzpatrick, E. G., Soil Survey of Collin County, Te Series 1930, No. 32.

The overall productivity of land in cultivation has been somewhat reduce a result of erosion and continuous cropping. This loss in productivity has been offset by using fertilizers and installing conservation measure

Productivity of the flood plain has not been significantly reduced. The flooding hazard restricts the agricultural use of soils along the flood Floodwater and excess rainfall concentrates in low places from 1 to 5 da most years. This usually occurs during the spring months. This conditi has changed the plant composition in the flood plain.

Natural Vegetation

The entire watershed is in the Blackland Prairie vegetational area. Dr. Frank Gould describes the original prairie vegetation as "a true prairie with little bluestem as a climax dominant." 7/ Indiangrass, big bluest virginia wildrye, silver bluestem, and texas wintergrass are important grasses occurring in the area. Texas grama, smutgrass, and many annuals increase or invade (Appendix B).

There are four major vegetative sites that occur in the watershed area. They are blackland, eroded blackland, clayey bottomland, and claypan prairie range sites. There are a few distinct differences in the kinds and amounts of plants that occur within these vegetative sites.

7/ Gould, F. W., Texas Plants, A Checklist and Ecological Summary - MP-5 June 1962, Texas Agricultural and Mechanical College of Texas, Texas Agr tural Experiment Station.

The blackland, eroded blackland and claypan prairie range sites occupy upland areas and about 97 percent of the watershed. The original plant composition was a prairie, with grasses constituting about 85 percent of the vegetation and forbs 10 to 15 percent. Woody plants occurred mostly along drainageways as a few scattered plants or mottes. The dominant vegetation was composed of little bluestem, indiangrass, big bluestem, eastern gamagrass, switchgrass, virginia wildrye, florida paspalum, sideoats grama, vine-mesquite, white tridens, meadow dropseed, and numer forbs such as maximilian sunflower, engelmanndaisy, illinois bundleflowe western ragweed, sensitivebriar and tickclover. Woody plants occurred mostly as bands along the drainageways and included mostly live oak, cedar elm, hackberry, bumelia, and coralberry.

The topography of these range sites are nearly level to sloping and hill These soils are well to somewhat poorly drained. They are generally fertile and with good grass cover they favor air and water movement and root growth. The approximate total annual yield of this site in excelle condition ranges from 2,000 to 5,500 pounds per acre. As retrogression occurs, silver bluestem, texas wintergrass, sideoats grama and tall drop seed increase. If deterioration continues, buffalograss colonies form. Texas grama, hairy tridens, windmillgrass, threeawn, tumblegrass, and annual forbs invade.

The clayey bottomland range site occupies the bottomland areas and is a savannah site. The original plant composition is about 75 percent grasses, 20 percent woody species and 5 percent forbs.

This site makes up about 3 percent of the area above the structures. Th original vegetation was composed of sedges, virginia and canada wildrye, switchgrass, indiangrass, little bluestem, big bluestem, eastern gamagra vine-mesquite, florida paspalum, oak, elm, hackberry, black willow, peca hawthorn, greenbrier, peppervine, trumpetcreeper, honeysuckle, grapes, berryvines, tickclover, lespedeza, gayfeather, ironweed, and ragweed.

The topography of the area is nearly level to gently sloping. The soils are somewhat poorly drained adjacent to the natural stream channels. The soils are deep and receive overflows and runoff from adjacent higher lying soils. These soils with good vegetative cover have a favorable plant-soil-moisture relationship. The approximate total annua yield of this site in excellent condition ranges from 4,000 to 7,500 pounds per acre.

As retrogression occurs, trees and shrubs increase and form a dense canopy cover. Shade tolerant plants become prominent. Bermudagrass and buffalograss invade open areas. Broomsedge, smutgrass, and annuals also invade.

The present vegetation of the watershed area consists of a savannah of hackberry, bois-d-arc, elm, black willow, honeylocust, mesquite and pricklyash mostly in large motts in the flood plain areas. Understory

vegetation is rather sparse except along fence rows and roads. Greenbrier and coralberry make up most of the understory vegetation. Herbaceous vegetation consists of common bermudagrass, threeawns, canada wildrye, texas wintergrass, texas grama, King Ranch bluestem, johnsongrass, hooded windmillgrass, silver bluestem, black medic, annual broomweed, cocklebur, ragweed, and sunflower. Almost all of the land in the watershed area was formerly in cropland which has been converted to permanent pasture-land. Introduced varieties such as coastal bermudagrass, weeping lovegrass and tall fescue have replaced much of the native herbaceous vegetation.

Threatened or Endangered Species

There were no rare or threatened species of plants observed at any of the structure sites during the field studies made for this assessment.

Brief Historical Background

The area first began to be settled about 1840 by pioneers seeking new land. They came mainly from the neighboring states of Arkansas, Tennessee, Kentucky, and Georgia, while some came from farther east. Most of these pioneers settled along the streams for availability of water and wood. The areas along the streams were in timber, while the prairies were in native grass, hence there was very little erosion problems at this time. This soon changed as the settlers found that the prairie land was fertile and could be cultivated by plowing up the sod which was much easier than clearing the timber as they originally were doing to place land into cultivation.

In 1846, the Texas Legislature created Collin County from Fannin County and named it after Collin McKinney, a pioneer settler of the area who signed the Texas Declaration of Independence. The county seat was established at Buckner in 1847, but was moved to McKinney about a year

As more of the upland prairie yielded to the plow to care for the increa demand for food and fiber, erosion problems began. With the grass prote tive cover gone from the hillsides, heavy rains washed the topsoil away and caused flooding of the lowlands. This resulted in declining yields on the uplands and eventually, when no more new land was available, a decline in population occurred, because people were moving to more ferti areas.

Interest in soil conservation began about the time of World War I when the great demand for products was created. After the state authorized the creation of the Soil Conservation Districts in 1939, interest finall became great enough that the Collin County Soil and Water Conservation District was voted into creation in 1946.

Land Use

Early settlers of Collin County located near streams where water could be obtained and wood was available for fencing, fuel, and building purposes. They raised cattle, horses and sheep on the open range. Small patches were fenced with rail fences and corn, wheat, and oats were grown for home use. Cotton was grown only on small areas prior to the Civil War.

Most of the land was in free range until the introduction of barbed wire about 1874 when more land was fenced and larger tracts were put int cultivation. The building of the Houston and Texas Central Railroad through Collin County in 1873 furnished an outlet for farm crops and fa ing increased rapidly. Settlements gradually extended to the prairies

and farmers soon realized the blackland prairies were highly productive. For many years during early settlement, land could be purchased from $2 to $10 per acre depending on improvements. The acreage of land devoted to crops at 10 year intervals from 1879 to 1929 are as follows:

Year	Cropland (acres)
1879	135,567
1889	196,655
1899	373,610
1909	352,762
1919	360,468
1929	357,631

In 1930, about 72 percent of the land was used for cropland 6/ and in 1967, about 63 percent of the land was used for cropland. The acreages of cropland in 1958 were 375,500 acres and 315,689 acres in 1967.8/ Trends in recent years are to return much of the cropland to improved pastures and hayland. These are mostly planted to coastal bermudagrass common bermudagrass, Kentucky 31 fescue and weeping lovegrass. In 1973 about 500 acres of cropland were planted to pasture and hayland. 9/

The present land use for the drainage areas above the four structures a shown in the following table:

8/ Conservation Needs Inventory, Texas - 1970, published by the Texas Conservation Needs Inventory Committee.
9/ 1973 Annual Report Collin Soil and Water Conservation District.

Land Use	Units	Acres	Percentage
Cropland	acre	1,750	33
Pastureland	acre	3,047	58
Rangeland	acre	350	6
Wildlife land	acre	106	2
Miscellaneous	acre	53	1
Total watershed		5,308	100

There are about 54 operating units in the area ranging from 400 to 40 acres in size.

The major agricultural products produced in the county are cotton, wheat, grain sorghum, hay, oats, corn, beef cattle and dairy products. Some per acre crop yields in the watershed area are as follows:

Cotton lbs. lint	Wheat bushels	Grain Sorghum bushels	Pasture AUM
380	25	35	4
425	30	85	8

These yields are those that could be expected from a high level of management with a good conservation and fertilization program. A spread is used to reflect what could be expected due to climatic variations. In the watershed area about 28 percent of the land shows evidence of erosion and about 3 percent is severely eroded. Some of the cropland areas that are not terraced or with a poorly maintained terraced system have evidence of erosion. Sheet erosion is most extensive with numerous rills and a few small gullies on the steeper areas. Some area adjacent to drainage ways are severely eroded with gullies several feet deep and several feet across and cannot be crossed with farm machinery. These areas may be small in size, but contribute dramatically to sediment problems in streams and lakes.

Land treatment needs which need to be installed on the watershed are conservation cropping system, critical area planting, grassed waterway or outlet, pasture and hayland management, pasture and hayland planting and wildlife upland habitat management. 10/

Water Resources

The stream tributaries draining into these four sites are natural streams. They are small unnamed tributaries to Little Elm Creek and are about 20 miles upstream from Garza-Little Elm Reservoir, formed by the Lewisville Dam. This was a federally authorized structure, constructed by the U. S. Corps of Engineers and completed in 1955. It has a total planned storage of 1,016,200 acre-feet of which 526,700 acre-feet are for flood control, 415,000 acre-feet are for water supply for Dallas, and 21,000 acre-feet are for water supply for Denton. Planned sediment storage capacity is 53,500 acre-feet.

Streamflow is intermittent above the four structure sites. The quality of the runoff has not been tested, but is believed to be of good quality. The watersheds above each of the sites are agricultural land with the runoff coming mainly from grassland with some runoff originating on cropland.

10/ USDA, Soil Conservation Service, National Handbook of Conservation Practices, July 1971.

There were no commercial livestock feeding lots or other operations observed or known to exist in the site drainage areas which would be pollution sources to the runoff floodwaters entering these four structures.

Water for domestic use is supplied from local privately-owned wells ranging in depth from about 400 to 700 feet. There is also a water supply district at Celina that is presently furnishing water to the rural population near the structure sites. The source of ground water is from the Woodbine formation and is obtained by a well about 1,200 feet deep.

Wetlands

Type V (inland open water) is found within this watershed. This habitat is characterized by approximately 60 farm ponds scattered throughout the watershed. Waterfowl use these ponds primarily as resting areas during migratory periods. This watershed is located in the Central Waterfowl Flyway. 11/

Fish and Wildlife Resources

Approximately 97 percent of this watershed can be classified as an uplar type wildlife habitat. This portion of the Little Elm Creek watershed is located in the Blackland Prairies Land Resource Area. Soils of the

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11/ Wetlands of the United States, U. S. Fish and Wildlife Service, USDI Circular 39, 1971.

Houston Black, Houston and Ferris series predominate. Present in minor amounts are soils of the Burleson and Wilson series. Overall, these soils are rated fair for producing upland wildlife habitat elements.

The upland areas were intensively cultivated in the past; however, there is now a changing trend in land use. Much of the cropland is being plant to grasses and some of the land is being developed into rural homesites.

The vast majority of the upland habitat is a openland type. This habita is characterized by open grassland areas interspersed with cropland fiel and small bands and motts of brush.

Most of the cropland is dedicated to growing cotton, wheat, grain sorghu and annual grazing crops.

Grassland areas consist mainly of improved pastures, which are generally planted to common or coastal bermudagrass. Rangeland in this area is ge erally cropland that has been allowed to return to grass. Major grasses found in these native pastures are common bermudagrass, texas grama, threeawns, silver bluestem, hooded windmillgrass, King Ranch bluestem, a johnsongrass. Forbs common to the area are annual broomweed, goldenrod, ironweed, western ragweed, common sunflower and maximilian sunflower.

Brushy and wooded areas associated with the upland habitats are found along fence rights-of-way, along drainageways and in small scattered mot Major overstory woody species present are bois d'arc, hackberry, mulber cedar elm, american elm, pricklyash and honeylocust. Associated with th

are understory species such as coralberry, smilax, dewberry, wild plum, wild grape, and poisonoak. These wooded areas, interspersed with open grassland areas and fields, provide the "edge effect" as described by Aldo Leopold 12/ as being so essential in the habitats of many wildlife species.

Throughout the upland, many fence rights-of-way, drainageways and odd areas support moderate to dense stands of johnsongrass. These areas afford food and cover for several kinds of upland birds and mammals, especially where the johnsongrass areas are in proximity to cropland.

About three percent of this subwatershed can be classified as bottomland habitat. Soils of the Trinity series are dominant in these areas. The bottomland habitats are located in bands which vary in width along t major stream courses of Little Elm Creek and its tributaries, These are are characterized by bands of trees and brush along the stream banks ani open grassland or cropland fields extending outward over the remaining bottomland area. The bands of trees vary in width from a few feet up to several hundred feet. Major overstory species are bois d'arc, honeyloc hackberry, black willow, cedar elm, bur oak, mulberry and pricklyash. Understory species commonly found are coralberry, smilax, carolina snail seed, dewberry, bumelia, and poisonoak.

12/ Leopold, Aldo - Game Management, Charles Scribner's and Sons, New York, New York, 1933.

The associated grassland areas are composed of grasses such as common bermudagrass, texas wintergrass, hooded windmillgrass, tall dropseed, sideoats grama, silver bluestem, and threeawns.

This watershed is located in the Central Waterfowl Flyway. During migratory periods, various species of waterfowl migrate through the area. This region of Texas is also within the migration routes of three endangered species of birds - the southern bald eagle, the whooping crane and the American peregrine falcon. 13/

Several species of birds, mammals, reptiles and amphibians inhabit the upland and bottomland areas of this watershed.

Birds commonly found are mourning dove, bobwhite quail, meadowlarks, mockingbirds, eastern kingbirds, horned larks, various raptors, shore birds and other song birds indigenous to the area. During periods of migration, various species of waterfowl make light to moderate use of farm ponds. Cropland areas afford limited feeding areas for waterfowl. The bobwhite quail and mourning dove represent the most important game birds in this watershed. A bobwhite quail census, conducted in August 1974 by the Texas Parks and Wildlife Department, indicated a low population of quail - one quail per 14.8 acres. Mourning dove numbers, based on roadside counts, indicated a low dove population - 2.55 dove per mile

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13/ U. S. Fish and Wildlife Services Resource Publication No. 114, Threatened Wildlife of the United States, March 1973, and List of Endangered Native Fish and Wildlife, October 1973.

Major mammals found in this watershed are fox squirrel, cottontail rabbi coyotes and furbearers such as raccoon, gray fox, bobcats and opossum. Because of the sparse population of furbearers in the watershed, only a small amount of trapping occurs. Fox squirrels represent the major game mammal in the watershed. The squirrel population is considered to be low. A census of the squirrel population, conducted by the Texas Parks and Wildlife Department in August 1974, indicated that there were about 2,543 squirrels in the county. 14/

Changes in land use represents the basic problem affecting wildlife and habitats in this watershed. The trend of cropland and rangeland being planted to improved pastures (such as common bermudagrass and coastal bermudagrass) and then managed for a high level of production has reduce the quality of habitat for many kinds of wildlife. Also, in recent year wildlife habitat losses resulting from human disturbances such as home subdivision and ranchettes developments, has had an adverse impact on wildlife resources within this watershed. The clearing of wooded areas for pasture or cropland has reduced the habitat for squirrel and other mammals and birds associated with these wooded areas.

Little Elm Creek is an intermittent stream and there are no significant fishery habitat present. Pond fisheries in this watershed are represent

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14/ Population data were obtained through personal contact with Clyde Holt, Jr., Biologist, Texas Parks and Wildlife Department, Decatur, Texas, December 1974.

by about 60 farm ponds scattered throughout the area. Most of these are stocked with sunfish, largemouth bass and channel catfish. About 25 percent of these ponds are managed for sports fish production. There are no lakes in the area covered by this assessment.

Little Elm Creek dries up nearly every year. During high rainfall periods, potholes along some reaches of the creek may contain fish such as sunfish, catfish, and various species of rough fish. These fish are washed in from farm ponds in the watershed. Farm ponds in the watershed are generally stocked with sunfish, largemouth bass, and channel catfish Some ponds also contain various species of rough fish. The basic proble with pond fisheries is the lack of fisheries habitat management. Most ponds are stocked with fish but no management applied. No data are available on populations of fish in these ponds.

Hunting, fishing, and other recreational uses of the fish and wildlife resources in this watershed can be classed as private and not open to the general public. Fishing and recreational hunting is generally limit to the land user and his guests. Very little, if any, lease hunting or fishing is available in the watershed.

Air Quality

The air is of good quality and there are no known problems in the area.

Historical and Archeological Resources

There are no historic sites listed in the National Register of Historic Places for this area. Mr. John McGraw, member of Collin's County local historical society, was contacted in regard to historical sites and he confirmed that there were none in the watershed.

An archeological survey was made on all the four structural measures covered by this assessment. Mr. C. Reid Ferring of the Archeology Research Program, Southern Methodist University, conducted the survey in December 1974. The survey revealed that there are no archeological sites in the area to be affected by structure Nos. 13, 14, 15, and 16.

Social and Human Resources

The 1960 census showed Collin County to have a population of 41,247. The 1970 census showed a population of 66,920, which is an increase of 62.2 percent. The population increased to 80,000 in 1973. Based on thi increase, the projected population by 1980 will be about 110,418 for the county. In the latest census, Collin County was the second fastest grow county in the state, population percentage-wise.

Land in the McKinney Field Office still being farmed or ranched is selli for an average of $3,200 per acre. The reason for this investment of money by urban dwellers in land is for short-term speculation and rural small tract ranchettes. The country side near McKinney is evidencing this type of developments. 15/

15/ Workload Analysis, McKinney Field Office, SCS, September 1974.

Based upon the 1971 records, there was 3.5 percent unemployment for the county. The rate of old age assistance per thousand was 24.1. The 1970 Negro population for the county was 7.2 percent. The school enrollment showed pupils with Spanish surname at 7.1 percent. The rural population in 1970 was 41.7 percent for Collin County. 16/

There are currently about 65 percent absentee ownership of agricultural land in the county. For the most part, a high percentage of the familie in which one or more members hold a regular job in the metropolitan complex of Dallas-Fort Worth reside on the land and produce small acreag of crops as a sideline or hobby.

Summary of Major Environmental Problems

Floodwater damage is still a major problem on the Little Elm Creek tribu While flood damage reduction has been reduced with the partial installat of planned system of floodwater structures, the total objectives of floo water damage reduction will not be attained for this hydrologic unit unt all floodwater dams are installed. With all the planned dams installed, flood plain on Little Elm hydrologic unit will provide a flood-free protection to about 4,950 acres up to and including the two-year frequency; 3,250 acres will be protected to the five-year frequency; and 1,075 acre for the 15-year frequency.

16/ Selected Historical, Social and Demographic Information by Texas Cou USDA, SCS, Temple, Texas, April 1974.

Poor plant composition associated with low productivity is also a proble About 3,100 acres (58 percent) of the land that was once in cultivation has been retired and permitted to reestablish itself by natural plant succession or planted to grasses such as bermudagrass or coastal bermuda grass. Most of this acreage produces sufficient cover annually to prote the soil surface from significant erosion. About 275 additional acres need to be established to higher producing plant varieties. An addition 950 acres of pastureland above the four proposed dams need to be managed to improve the 75 percent grass composition but retain as much of the 20 percent woody species composition as possible over the long term for wilflife habitat.

Critical erosion damage needs to be controlled on about 80 acres. These areas are scattered over the upland portion of the watershed about the proposed dam sites and need special treatment.

Additional vegetative waterways need to be built to safely convey excess surface water to safe points of release. These waterways will require about 8 acres of land.

Low populations of dove and quail exist within the watershed area. This is true for other forms of wildlife which means that the quality of habitat for many wildlife species should be emphasized.

The basic problem with pond fisheries is the lack of fisheries habitat management. There are about 60 pond fisheries within this study area with about 15 being managed for sport fish production.

Sediment deposition on flood plain lands downstream has damaging impacts on production capability of the lands, farm ponds, and reducing the capacity of the stream channels by channel filling. It is estimated that at least 500 acres of flood plain are being damaged by deposition of sediments.

Urbanization or small ranchettes are encroaching into the agricultural sector. The result is a deterioration of wildlife habitat by clearing woody vegetation for housing and improved pasture plantings on small individual acres.

Absentee ownership (65 percent) of agricultural properties makes it difficult to plan, apply, and manage agricultural units and protect the land resource base.

Converting native grassland and woody areas in the flood plain will improve pastures of common bermudagrass or coastal bermudagrass for high levels of production. This type of action will decrease the habitat quality for most species of upland and bottomland birds and mammals that are associated with these areas. This action will have long-term impacts on wildlife habitat.

ENVIRONMENTAL IMPACTS

The installation of the structural measures and application of the land treatment measures being assessed will have the following impacts:

Erosion and Sedimentation

The land treatment measures installed in connection with the structures will help protect the environment by reducing erosion. Less sediments will reach existing lakes and improve water quality.

The potential for erosion during construction process will be increased slightly due to the removal of vegetation and soil disturbance on the site. The actual erosion at the construction site will depend upon rain during construction and prior to vegetation. It is not expected that more than two of the structures will be constructed simultaneously.

The sediment pools will trap sediment and reduce downstream flood plains from being scoured and additional sedimentation. This reduction in erosion and sedimentation will prolong life to the Garza-Little Elm Reservoir, stream channels, as well as small ponds.

Water Table

The installation of these structures should have little effect on the wa table. They could possibly raise the water table temporarily immediatel below sites as a result of seepage losses, but this would be minor if it occurs. The impoundments of water in the sediment pools could raise the

water table immediately around the pools, but the impact will not be out the site areas. The increase in elevation of the water table would chan the plant community slightly. This change should be relatively insignificant and is impossible to quantify without extensive studies.

Land Use

The installation of these structural measures will cause some changes in the present land use as indicated in the following table:

Land Use	Present	After Project Installat
Pastureland - open	376	248
Pastureland - wooded	10	2
Water Area	0	136

Based upon land use trends that are occurring within the watershed, it is reasonable to expect that the following changes may occur by the end of the project installation period:

Land Use	Present	Future
Cropland	1,750	1,010
Pastureland	3,047	3,651
Rangeland	350	350
Wildlife land	106	106
Water area	15	151
Miscellaneous	40	40

There is a total of about 80 acres of wooded area now in the drainage areas above the four structure sites which support wildlife in some form

Water Resources

The installation of these four structures will cause a change in the flo regime immediately downstream of the sites and in Little Elm Creek.

The depth, velocity and duration of out-of-channel flows will be reduced The duration of low flows (within channel) will be increased. This change in flow regime will reduce flooding and associated flood damages. A detailed study of the effects that these four floodwater retarding structures of changing the flow regime has not been made. However, the work plan (pages 13-14 and 24-25) describes the impact that all the structures will have on Little Elm Creek as a result of changing the flow regime. The installation of these four floodwater retarding structures will contribute to these impacts.

The installation of these structures should have a slight effect on water quality. The sediment concentrations in the floodwater will be reduced as it passes through the structures. The structures are designe to store 2,199 acre-feet of sediment during a 100-year period. The sedi ment pools will initially provide four separate water impoundments that can be used for livestock water, domestic uses, or other uses as long as applicable water rights are acquired.

Approximately 600 feet of natural intermittent streams will be destroyed by the dams and about 13,400 feet of natural intermittent stream will be inundated by water and sediment in the sediment pools.

The installation of the structures should have very little effect on the water table. There is a possibility of raising the water table immediat below the sites as a result of seepage losses, but this should be very minor if it occurs.

Air Quality

The only impact that the installation of the structures will have on air quality is during construction and any operation and maintenance activit: There will be a slight increase in pollutants such as dust and chemicals from equipment exhausts during these phases. Also, there will be an increase in noise levels as a result of these activities. The construction sites are in a rural area. Construction noise or air pollution during construction or maintenance activities will not be of such a level to be more than a nuisance.

Vegetative Composition

The installation of the watershed structures will result in the removal of the existing vegetation from about 179 acres. About 8 acres of woody vegetation adjacent to the stream courses will be removed with project installation. These species are primarily hackberry, oak, elm, bois d'ar honeylocust, and willow.

Threatened or Endangered Plants

There were no threatened or endangered species of plants observed.

Fish and Wildlife Resources

Installation of the four floodwater retarding structures will directly affect 179 acres of terrestrial wildlife habitat.. This action will destr about 136 acres of terrestrial habitat and will represent long-term impac This 136 acres is composed of 8 acres of wooded habitat and 128 acres of open grassland habitat. Vegetation on the remaining 43 acres will be modified. This 43 acres represents the total acres in dams and emergency spillways. When construction is completed, these areas will be revegetat using multipurpose vegetation where feasible. The temporary removal of

vegetation from this 43 acres will represent a short-term impact on the habitat.

An additional 207 acres of terrestrial wildlife habitat in the detention pools of the four floodwater retarding structures will be subject to periodic inundation. This terrestrial habitat is composed of approximat 204 acres of open grasslands and two acres of wooded habitat. This will have an adverse effect on ground-nesting birds and burrowing mammal that associated with these acreages, and will have long-term impacts.

With the added level of flood protection, it is expected that land users will convert native grasslands and wooded areas in the flood plain to improved pastures of common bermudagrass or coastal bermudagrass and apply practices to obtain high levels of production. This will decrease the habitat quality for most species of upland and bottomland birds and mammals that are now associated with these areas. This action will have long-term impacts on wildlife habitat.

Conversion of cropland and rangeland to bermudagrass pastures and manage for high levels of production will reduce erosion and increase forage fc livestock. However, this conversion will decrease the food supply for dove, quail and other forms of wildlife associated with the cropland and rangeland areas. This will have long-term impacts on wildlife habitat.

Installation of the project will reduce downstream flooding. This will have long-term impacts and will improve the habitat for ground-nesting birds and burrowing mammals.

Edge habitat, associated with water areas, will be created adjacent to the sediment pools.

Land treatment measures, when applied, are expected to have the following impacts on wildlife habitat:

Crop residue management and conservation cropping systems will provide a greater abundance of food and cover for quail, dove, cottontail rabbit and various song birds and other mammals associated with cropland fields The application of these practices will also reduce sediment flow into lakes, ponds, and streams.

Proper grazing use, deferred grazing and planned grazing systems will afford more food and cover for wildlife associated with grassland areas. The application of these practices will also reduce sediment flow into lakes, ponds and streams.

Wildlife upland habitat management will improve habitat for desired kinds of wildlife. Pasture management on bermudagrass pastures, when applied with consideration for wildlife habitat, can maintain food supplies for upland and bottomland birds and mammals.

Human disturbances during the construction period will have adverse effects on wildlife in proximity to the construction site. This will represent a short-term impact.

This watershed is located in the Central Waterfowl Flyway. During migratory periods various species of waterfowl migrate through the area.

Installation of the project will add an additional 136 acres of Type V wetland. This will increase the resting area for migratory waterfowl. This region of Texas is also within the migration routes of 3 endangered species of birds. These are the southern bald eagle, the whooping crane and the American peregrine falcon. Installation of the project is not expected to have any impacts on these species.

Construction of the dams, emergency spillways and sediment pools of the four floodwater retarding structures will require the removal of approxi mately 8 acres of wooded habitat. This will reduce the already scarce habitat for squirrel. This loss is expected to cause a small reduction in the number of squirrels in the watershed.

The trend for conversion of cropland and rangeland to bermudagrass pastu will reduce the quality of habitat for upland birds such as dove, quail, and many species of song birds. This will bring about a reduction in the number of upland birds these areas can support.

Little Elm Creek has no stable fishery habitat. Installation of the project is not expected to create any stream fishery habitat.

Installation of this project is not expected to have adverse impacts on existing farm ponds. Installation of the project is expected to reduce sediment flow into farm ponds. This will prolong the life of the pond and improve pond fisheries habitat.

The sediment pools of the four floodwater retarding structures will create abour 136 acres of fishery habitat. This will afford opportuniti to concerned landowners to stock these bodies of water with desired species of fish and apply fish pond management. Installation of the project is not expected to have adverse impacts on the existing farm ponds in the watershed.

Rare or Endangered Species of Animals

This region of Texas is within the migration route of three endangered species of birds. These are the southern bald eagle, the whooping crane and the American peregrine falcon.

There are no known rare or endangered mammals occurring in this watershe

Wetlands

The sediment pools of the four floodwater retarding structures will crea approximately 136 acres of Type V wetland habitat. These water areas wi afford resting areas for migratory waterfowl.

Mineral Resources

There are no known economic mineral resources present in the subwatershe The highly expansive clays make them unsuited for brick clay. There are no known sources of sand or gravel in the area. The soils are too claye for use as topsoil.

Historical and Archeological Resources

There are no known historical sites that will be affected by the install tion of these structural measures.

No archeological resources were found by the qualified team of archeologists from Southern Methodist University during their field survey and i was recommended that no additional survey work was necessary at the four site locations.

Economic

These measures will contribute to achievement of the economic benefits expected to occur with the completion of installation of all planned structural measures within the hydrologic unit. The average ann benefits expected to result from the installation of this watershed proj for the Little Elm Creek Hydrologic Unit is $33,932. The installation c measures covered by this assessment will contribute to these benefits. The reduction on flooding and flood damage will place additional money into the local economy. The construction phase and operation and mainte phase will create new jobs. This is an opportunity to develop income producing recreation and/or fish and wildlife development at the floodwa retarding structure sites.

There will be a loss of agricultural production from land inundated by the sediment pools and during construction from the land in dams and emergency spillways. There will be some interruption of agricultural us of the land in the detention pools. This loss in agricultural productio will be insignificant insofar as the overall agricultural production of area is concerned.

Social

The impact of the installation of these measures on society will be slight. None of the landowners involved should have to make any changes in their operations. There is a possibility of people from urban areas purchasing portions of land at the structures for weekend recreation.

Other

The installation of the structural measures will not result in any relocation or displacement of persons, businesses, or farming operations

FAVORABLE ENVIRONMENTAL IMPACTS

The favorable environmental impacts are as follows:

1. Floodwater damage will be reduced.
2. Erosion and sedimentation will be reduced.
3. Volume of silt being delivered downstream to Garza-Little Elm Reservoir will be reduced.
4. Installation of the project will reduce downstream flooding. This will improve the habitat for ground-nesting birds and burrowing mamm
5. Edge habitat, associated with water areas, will be created adjacent to the sediment pools. This will be beneficial to some forms of wildlife.
6. Land treatment measures such as conservation cropping systems, crop residue management, proper grazing use, deferred grazing, planned grazing systems, wildlife upland habitat management, and fish pond management will improve the overall habitat for fish and wildlife r

7. The use of multipurpose vegetation on dams and emergency spillways of the four floodwater retarding structures will create approximately 43 acres of open grassland wildlife habitat.
8. The sediment pools of the four floodwater retarding structures will create approximately 136 acres of fisheries habitat.
9. The sediment pools will create approximately 136 acres of Type V wetland habitat. These water areas will afford resting areas for migratory waterfowl.
10. Installation of the project will reduce sediment flow into farm ponds. This will improve the fishery habitat in these ponds.

ADVERSE ENVIRONMENTAL IMPACTS

The installation of the project is expected to have the following adverse impacts:

1. There will be a reduction of terrestrial wildlife habitat. Sediment pools of the four floodwater retarding structures will destroy 136 acres of terrestrial habitat. This includes 8 acres of wooded habitat and 128 acres of open grassland habitat.
2. Vegetation on 43 acres of open grassland habitat will be destroyed during installation of the structures. This action will represent a short-term impact.
3. In the detention pools of the floodwater retarding structures, 206 acres of terrestrial habitat will be subject to periodic inundation. This will have an adverse effect on ground-nesting birds and burrowing mammals.

4. The destruction of about eight acres of woody habitat in the areas needed for dams, emergency spillways, and sediment pools will reduce scarce habitat for squirrel and cause a small reduction in the number of squirrels.

5. Human disturbances during the construction period will have adverse effects on wildlife in proximity to the construction site. This will be short-term.

ALTERNATIVES

Alternatives that were considered during planning included the effects of land treatment measures above and land treatment measures with differ combinations of floodwater retarding structures.

There is no record of any other alternatives that were considered during planning.

One additional alternative that could have been considered during planni was to forego the project. Foregoing the project would have allowed the natural process of erosion, sedimentation, and flooding to continue. Th would have permitted soil, water, and related resources to gradually deteriorate.

Alternatives to the plan available at the present are:

1. Install only the remaining land treatment measures.
2. Forego installing the remaining measures.

Alternative No. 1 - To install only the remaining land treatment measures would not have any appreciable effects on floodwater damage reduction. At the most, only about 3 percent reduction could be expected. This alternative would achieve some reduction in erosion and sediment damages.

Alternative No. 2 - To forego installation of the remaining measures would allow erosion, sediment, and flood damages to occur at their present rate. Over the long term, the cumulative effects would not be favorable to agricultural purposes. The adverse impacts of installing these measures would be avoided.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT ON THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The installation of the proposed action on the watershed will help maintain and enhance the long-term quality and productivity of the human environment in the area.

The provisions for flood prevention, control of erosion and sediment deposition will allow citizens of the area to use the soil, water, and related resources wisely for the short-term and the long-term. Many of the factors which cause degrading of the environment will have been eliminated or at least reduced to acceptable limits.

The installation of the project will require about 386 acres of land for the project purposes. However, this is a small percent of the land in the local area. Opportunities for fishery habitat will be created where none exist and the overall impact on the wildlife habitat will be gain. There is a potential to attract the installation of residential

development around the structures.

The quality of the human environment will be improved over the quality of the environment that exists without the installation of the project.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The project will commit about 386 acres of agricultural land to construc tion and functioning of the structural measures. The sediment pools wil require 136 acres which will be retired from agricultural production. T dams and spillways will require about 43 acres which will be restricted to grass production. The floodwater retarding pools will require 207 acres which will be subject to temporary inundation occasionally which will restrict its use to agriculture or some other use which will allow temporary inundation.

The installation of these structural measures will require the commit- ment of labor, material, energy, and capital expenditures for constructi and the operation, maintenance, and replacement of short-lived portions of the project.

CONSULTATION

The work plan was developed in consultation and cooperation with interested agencies and individuals. Meetings were held with the local people during work plan development.

As a part of this assessment, Mr. John McGraw, Collin County Historical Committeeman, was contacted concerning historical sites in the watershed Also, a review was made of the National Register on Historic Places.

Archeologists of the Archeology Research Program of Southern Methodist University conducted an archeological survey of the structural measure sites through funding by the USDA, Soil Conservation Service.

CONCLUSION

Based on an assessment of the environmental issues listed in Section 650.8b,1 and Section 650.8b,2 of the U. S. Department of Agriculture, Soil Conservation Service, Preparation of Environmental Impact Statement Guidelines, as published in the Federal Register on June 3, 1974, it is the judgment of the team preparing the environmental assessment that the installation of the works of improvement covered in this assessment in t Little Elm and Laterals watershed project will not cause significant adverse impacts to the human environment or result in undue controversy over environmental issues. We therefore recommend that a Negative Decla tion be prepared and properly processed and filed.

Joe B. Camp

Joe B. Camp, Team Captain
for Assessment Team of:

Joe B. Camp, RC&D Specialist, Temple
Bill Miller, Agronomist, Temple
Morrison W. Liston, District Conservationist, McKinney
Alan R. Ford, Soil Scientist, Denton
James Henson, Biologist, Temple
Arnold D. King, Agronomist, Gainesville

STRUCTURE DATA
Floodwater Retarding Structures
Little Elm and Laterals Watershed, Texas
(Trinity River Watershed)

Item	Unit	13	14	15	16
Drainage Area 1/	sq.mi.	3.38	1.74	2.50	0.68
Storage Capacity					
Sediment Pool	ac.ft.	200	171	200	116
Sediment Reserve Below Riser	ac.ft.	4	-	9	-
Sediment Reserve Above Riser	ac.ft.	16	14	16	9
Floodwater Detention	ac.ft.	710	482	767	185
Total	ac.ft.	930	667	992	310
Surface Area					
Sediment Pool 2/	acre	42	43	39	22
Floodwater Detention Pool	acre	101	103	104	44
Maximum Height of Dam	feet	29	23	30	24
Volume of Fill	cu.yds.	68,967	50,498	86,754	37,444
Emergency Spillway					
Type	-	Veg.	Veg.	Veg.	Veg.
Frequency of Use	years	28	100	100	100
Design Storm Rainfall					
Duration	hours	6	6	6	6
Total	inches	12.92	13.25	13.06	13.63
Bottom Width	feet	170	320	120	40
Design Depth	feet	4.0	4.0	3.0	3.0
Design Capacity	c.f.s.	3,735	7,147	1,678	510
Total Freeboard 3/	feet	5.0	5.0	4.0	4.0
Total Capacity	c.f.s.	5,440	10,240	2,664	888
Principal Spillway					
Capacity	c.f.s.	17	25	13	8
Capacity Equivalencs					
Sediment Volume	inches	1.22	2.00	1.69	3.47
Detention Volume	inches	3.94	5.20	5.75	5.14
Spillway Storage	inches	2.76	5.20	2.68	4.01
Class of Structure	-	A	A	A	A

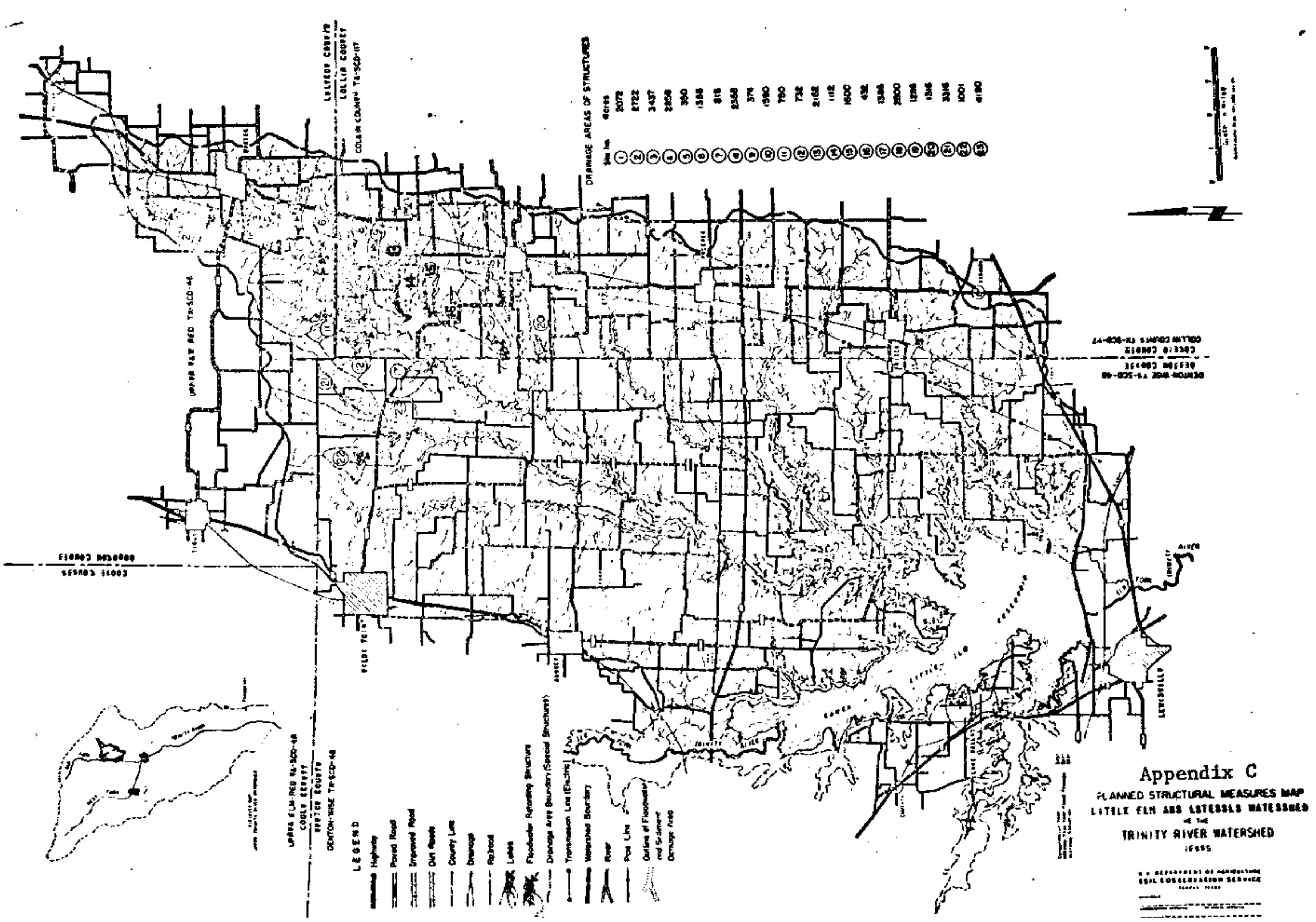
1/ Excluding the area from which runoff is controlled by other structures.
2/ Area at the elevacion of the top of riser.
3/ Difference between emergency spillway crest and elevation of the top of the dam.

List of Common and Scientific Names

Common Name	Scientific Name
big bluestem	Andropogon gerardi
silver bluestem	Andropogon saccharoides
little bluestem	Andropogon scoparius
broomsedge bluestem	Andropogon virginicus
knotroot bristlegrass	Setaria geniculata
buffalograss	Buchloe dactyloides
texas cupgrass	Eriochloa sericea
meadow dropseed	Sporobolus asper hookeri
eastern gamagrass	Tripsacum dactyloides
sideoats grama	Bouteloua curtipendula
texas grama	Bouteloua rigidiseta
yellow indiangrass	Sorghastrum nutans
jointtail carolina	Manisurus cylindrica
plains lovegrass	Eragrostis intermedia
flordia paspalum	Paspalum floridanum
rattail smutgrass	Sporobolus poiretii
switchgrass	Panicum virgatum
purple threeawn	Aristida purpurea
white tridens	Tridens albescens
hairy tridens	Tridens pilosus
tumblegrass	Schedonnardus paniculatus
vine-mesquite	Panicum obtusum
canada wildrye	Elymus canadensis
virginia wildrye	Elymus virginicus
hooded windmillgrass	Chloris cucullata
texas wintergrass	Stipa leucotricha
fall witchgrass	Leptoloma cognatum
bermudagrass	Cynodon dactylon
K.R. bluestem	Andropogon ischaemum
johnsongrass	Sorghum halepense
texas panicum	Panicum texanum
oldfield threeawn	Aristida oligantha
woollybucket bumelia	Bumelia lanuginosa
cedar elm	Ulmus crassifolia
sugar hackberry	Celtis laevigata
hawthorn	Crataegus species
common honeylocust	Gleditsia triacanthos
mesquite	Prosopis juliflora
live oak	Quercus virginiana
bois d'arc	Maclura pomifera
pecan	Carya illinoensis
herculesclub pricklyash	Zanthoxylum clava-herculis
black willow	Salix nigra
coralberry	Symhoricarpos orbiculatus
dewberry	Rubus species
grape	Vitis spp.
greenbrier	Smilax sp.
japanese honeysuckle	Lonicera japonica
peppervine	Ampelopsis arborea

common trumpetcreeper	Campsis radicans
green antelopehorn	Asclepias viridiflora
illinois bundleflower	Desmanthus illinoensis
engelmanndaisy	Engelmannia pinnatifida
narrowleaf gayfeather	Liatris mucronata
tall ironweed	Vernonia altissima
texas ironweed	Vernonia texana
slender lespedeza	Lespedeza virginica
western ragweed	Ambrosia psilostachya
catclaw sensitivebrier	Schrankia uncinata
maximilian sunflower	Helianthus maximiliani
tickclover	Desmodium spp.
black medic	Medicago lupulina
common broomweed	Gutierrezia dracunculoides
cocklebur	Xanthium sp.
common ragweed	Ambrosia artemisifolia
blood ragweed	Ambrosia trifida
snow-on-the-prairie	Euphorbia bicolor

Appendix C



PLANNED STRUCTURAL MEASURES MAP
OF THE
TRINITY RIVER WATERSHED
DRAINAGE AREAS OF STRUCTURES
Site No. Acres
1 2072
2 2722
3 3437
4 2858
5 350
6 1358
7 815
8 2358
9 374
10 1980
11 790
12 732
13 2162
14 1112
15 1600
16 436
17 1344
18 2800
19 1256
20 1316
21 3316
22 1001
23 4180
LEGEND
Highway
Paved Road
Improved Road
Dirt Roads
County Line
Drainage
Railroad
Lakes
Floodwater Retarding Structure
Drainage Area Boundary (Special Structures)
Transmission Line (Electric)
Watershed Boundary
River
Pipe Line
Outline of Floodwater and Sediment Damage Area
UPPER ELM-RED TX-SCD-46
DENTON-WISE TX-SCD-48
COLLIN COUNTY TX-SCD-117