

FINAL
WATERSHED PLAN
and
ENVIRONMENTAL IMPACT STATEMENT

ELM CREEK (I250) WATERSHED

RUNNELS AND TAYLOR COUNTIES, TEXAS



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TEMPLE, TEXAS

JULY 1981

ADDENDUM

4-83
03

Elm Creek (1250) Watershed, Texas

This addendum displays benefits, costs, and benefit-cost-ratio based on a ~~7 1/2~~ ^{7 1/8} percent rate, current normalized prices (~~June 1980~~ ^{Sept 1982}), and the ~~1980~~ ¹⁹⁸² price base.

Average annual project benefits, costs, and benefit-cost-ratio

are as follows:

		1982 Prices 7 1/8 Interest Rate
1. Project benefits are	\$568,840	715,630
2. Project costs are	\$467,630	551,060
3. The project benefit-cost ratio is	1.2:1.0	1.3:1.0

November 1981



EXECUTIVE SUMMARY

ELM CREEK (1250) WATERSHED
Runnels and Taylor Counties, Texas

WATERSHED PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

Planned under the Authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001-1008) and in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 USC 4321 et seq).

Prepared By: City of Ballinger
City of Winters
Elm Creek Water Control District
Middle Clear Fork Soil and Water Conservation District
Runnels Soil and Water Conservation District
Runnels County Commissioners Court
Runnels County Water Authority
Taylor County Commissioners Court
U.S. Department of Agriculture, Soil Conservation Service

The recommended alternative is a plan to reduce average annual flood damages, eliminate the apparent risk of loss of life from floodwater in every residence, improve the quality of life, and result in other favorable social effects.

Project Costs:

Item	PL-566 Funds (dollars)	Other Funds (dollars)	Total (dollars)
Land Treatment	143,000	80,000	223,000
Structural Measures	4,734,090	619,440	5,353,530

Average Annual Cost of Structural Measures: 440,070

Estimated Annual Cost of Operation and Maintenance: 5,070

Total Annual Cost: 445,140

Benefit Cost Ratio: With Intensification - 1.3:1.0
Without Intensification - 1.0:1.0

PROPERTIES BENEFITED BY STRUCTURAL MEASURES

Item	No. Benefited	Acres Benefited
Farming Units	150	12,284
Urban Residences	113	102

Land Use:	Watershed		Flood Plain	
	(acres)	(percent)	(acres)	(percent)
Cropland	108,450	46	7,984	51
Pastureland	4,490	2	3,339	22
Rangeland	112,434	47	4,055	26
Other	12,879	5	102	1
Total	238,253	100	15,480	100

Land Ownership in Watershed: Private - 99%; State/Local - 1%; Federal - 0%

Farm and Ranch Units in Watershed: 650 Average Size: 400 acres

Net Increase in Prime Farmland Soils: 1,050 acres

Wetlands: None

Endangered Species: No listed species present

Cultural Resources: 24 significant archeological sites affected

Responsible for Operation and Maintenance of Project Measures: Elm Creek
Water Control District and the City of Ballinger, Texas

AGREEMENT

Between the
Following Local Organizations:

City of Ballinger
City of Winters
Elm Creek Water Control District
Middle Clear Fork Soil and Water Conservation District
Runnels Soil and Water Conservation District
Runnels County Commissioners Court
Runnels County Water Authority
Taylor County Commissioners Court
all of the
State of Texas
(hereinafter referred to as the sponsors)

and the
Soil Conservation Service
United States Department of Agriculture
(hereinafter referred to as the SCS)

Whereas, application has heretofore been made to the Secretary of Agriculture by the sponsors for assistance in preparing a plan for works of improvement for the Elm Creek (1250) Watershed, State of Texas, under authority of the Watershed Protection and Flood Prevention Act (16 USC 1001-1008); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the SCS; and

Whereas, there has been developed through the cooperative efforts of the sponsors and the SCS this plan for works of improvement for the Elm Creek (1250) Watershed, State of Texas:

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through the SCS, and the sponsors hereby agree on this plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this watershed plan, including the following:

1. The sponsors will acquire, with other than PL 566 funds, such land rights as will be needed in connection with the works of improvement. The Elm Creek Water Control District will have primary responsibility for the land rights for the floodwater retarding structures. (Estimated cost \$515,750.) The City of Ballinger will have primary responsibility for the land rights for the dike system. (Estimated cost \$17,700.)

2. The sponsors assure that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

(Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the sponsors and SCS as follows:

	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Relocation Payment Costs</u> (dollars)
Relocation Payments	12.54	87.47	<u>1/ 0</u>

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages shown.

3. The sponsors will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

4. The percentages of construction costs to be paid by the sponsors and by SCS are as follows:

	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Construction Cost</u> (dollars)
7 Floodwater Retarding Structures	0	100	3,792,980
2 Floodwater Dikes	0	100	69,660

5. The percentages of the engineering costs to be borne by the sponsors and the SCS are as follows:

	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Engineering Cost</u> (dollars)
7 Floodwater Retarding Structures	0	100	301,370
2 Floodwater Dikes	0	100	6,960

6. The SCS will award and administer the contracts covering construction of all structural works of improvement.

7. The sponsors and the SCS will each bear the costs of project administration which it incurs, estimated to be \$4,500 and \$528,030, respectively.

8. The sponsors will obtain agreements from owners and operators of not less than 50 percent of the land above each reservoir and floodwater retarding structure that they will carry out conservation farm or ranch plans on their land. A minimum of 50 percent of the land upstream from each floodwater retarding structure will be adequately protected from erosion prior to construction of the dam.

9. The sponsors will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the watershed plan.

10. The sponsors will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.

11. The sponsors will be responsible for the operation, maintenance, and replacement of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.

12. The costs shown in this plan represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

13. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the SCS in carrying out the watershed plan is contingent upon the fulfillment of applicable laws and regulations, and the availability of appropriations for this purpose.

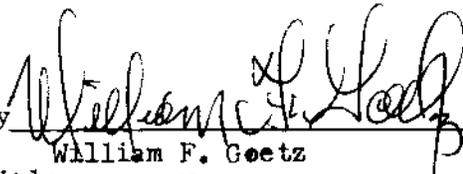
14. A separate agreement will be entered into between the SCS and the sponsors before either party initiates work involving funds of the other party. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

15. This plan may be amended, revised, or terminated only by mutual agreement of the parties hereto except that SCS may terminate financial and other assistance in whole, or in part, at any time it determines that the sponsors have failed to comply with the conditions of this agreement. In this case, SCS shall promptly notify the sponsors in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the sponsors or recoveries by SCS under projects terminated shall be in accord with the legal rights and liabilities of the parties.

16. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

17. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR 15.1-15.12), which provide that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.

City of Ballinger, Texas
Local Organization

By 
Title William F. Goetz
Mayor

City Hall, Ballinger, Texas 76821
Address Zip Code

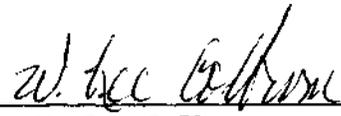
Date February 4, 1982

The signing of this agreement was authorized by a resolution of the governing body of the City of Ballinger, Texas adopted at a meeting held on January 19, 1982


~~SECRETARY~~, Local Organization
Charles F. Blackburn, City Administrator
Date February 4, 1982

City Hall, Ballinger, Texas 76821
Address Zip Code

City of Winters, Texas
Local Organization

By 
Title W. Lee Colburn
Mayor

310 S. Main, Winters, Texas 79567
Address Zip Code

Date 2/2/82

The signing of this agreement was authorized by a resolution of the governing body of the City of Winters, Texas adopted at a meeting held on January 18, 1982


~~SECRETARY~~, Local Organization
Glenn B. Brown, City Administrator
Date 2-8-82

310 S. Main, Winters, Texas 79567
Address Zip Code

Elm Creek Water Control District
Local Organization

c/o W.C. "Bud" Davis
Rt. 2, Box 32A, Winters, Texas 79567
Address Zip Code

By W. Lee Colburn
W. Lee Colburn
Title Chairman

Date 2/2/82

The signing of this agreement was authorized by a resolution of the governing body of the Elm Creek Water Control District

adopted at a meeting held on February 2, 1982

W.C. Davis
Secretary, Local Organization
W.C. Davis
Date February 2, 1982

Rt. 2, Box 32A, Winters, Texas 79567
Address Zip Code

Middle Clear Fork Soil and Water Conservation District
Local Organization

c/o Joe Montgomery
Rt. 1, Box 436
Abilene, Texas 79601
Address Zip Code

By Lloyd Gilmore
Lloyd Gilmore
Title Vice-Chair
Vice-chairman

Date 2-2-82

The signing of this agreement was authorized by a resolution of the governing body of the Middle Clear Fork Soil and Water Conservation District

adopted at a meeting held on January 7, 1982

R.E. Clemmer
Secretary, Local Organization
R.E. Clemmer

Date 2-2-82

Rt. 3, Box 117, Merkel, Texas 79536
Address Zip Code

Runnels Soil and Water
Conservation District
Local Organization

By Douglas Cole
Douglas Cole
Title Chairman

P.O. Box 387, Ballinger, Texas 76821
~~P.O. Box 387, Ballinger, Texas 76821~~
Address Zip Code

Date February 2, 1982

The signing of this agreement was authorized by a resolution of the governing
body of the Runnels Soil and Water Conservation District

adopted at a meeting held on January 8, 1982

Otto Gottschalk
Secretary, Local Organization
Otto Gottschalk
Date February 2, 1982

P.O. Box 387, Ballinger, Texas 76821
~~P.O. Box 387, Ballinger, Texas 76821~~
Address Zip Code

Runnels County Commissioners Court
Local Organization

County Court House
Ballinger, Texas 76821
Address Zip Code

By Bill B. Strutz
Bill B. Strutz
Title Runnels County Judge
Date 2-2-82

The signing of this agreement was authorized by a resolution of the governing
body of the Runnels County Commissioners Court

adopted at a meeting held on January 12, 1982

Frankie Berryman, County Clerk
County Court House
Ballinger, Texas 76821
By Linda Bruchmiller, Deputy
~~XXXXXX~~, Local Organization Address Zip Code
Linda Bruchmiller
Date 2-2-82

Runnels County Water Authority
Local Organization

c/o Arnold Frerich
Rt. 1, Box 93, Rowena, TX 76875
Address Zip Code

By Arnold Frerich
Title Arnold Frerich
Chairman
Date February 9, 1982

The signing of this agreement was authorized by a resolution of the governing body of the Runnels County Water Authority

adopted at a meeting held on January 21, 1982

James Mueller
Secretary, Local Organization
James Mueller
Date February 2, 1982

c/o Mueller Supply Co.
Highway 67 S., Ballinger, TX 76821
Address Zip Code

Taylor County Commissioners Court
Local Organization
County Court House
300 Oak, Abilene, Texas 79601
Address Zip Code

By James R. McMillion
Title James R. McMillion
Taylor County Judge
Date February 2, 1982

The signing of this agreement was authorized by a resolution of the governing body of the Taylor County Commissioners Court

adopted at a meeting held on January 11, 1982

Janice Lyons, County Clerk
Secretary, Local Organization
Janice Lyons
Date Feb. 3, 1982

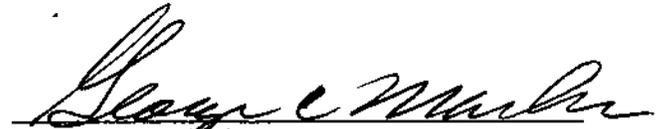
County Court House
300 Oak, Abilene, Texas 79601
Address Zip Code

Appropriate and careful consideration has been given to the environmental impact statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service

United States Department of Agriculture

Approved by:



George C. Marks
State Conservationist

FEB 26 1982

Date

WATERSHED PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

ELM CREEK (1250) WATERSHED

Runnels and Taylor Counties, Texas

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.	1
AFFECTED ENVIRONMENT.	1
WATERSHED PROBLEMS.	5
Land and Water Management Problems.	5
Erosion Problems.	6
Sediment Problems	7
Floodwater Problems	7
Fish and Wildlife Problems.	9
Ground Water Quality.	17
PROJECT GOALS	17
National Economic Development	17
Environmental Quality	18
PROJECT FORMULATION	18
ALTERNATIVES.	24
PLANNED PROJECT	28
Land Treatment.	28
Structural Measures	28
INSTALLATION COSTS - MONETARY	35
INSTALLATION AND FINANCING.	36
Schedule of Obligations	37
Modification of Existing Improvements	39
OPERATION, MAINTENANCE, AND REPLACEMENT	40
ENVIRONMENTAL CONSEQUENCES.	41
Floodwater.	42
Erosion	44
Sedimentation	45
Land Use and Prime Farmland Soils	45
Streams and Lakes	47
Wildlife Habitat.	48
Fish.	51
Surface Water Quality	51
Transportation.	52
Economy, Employment, and the Minority Population.	53
Air Quality	53
Cultural Resources of National Significance	53
Visual Resources.	54
CONSULTATION.	54
Summary of Actions to Mitigate Adverse Impacts.	57
DISCUSSION AND DISPOSITION OF EACH COMMENT ON DRAFT ENVIRONMENTAL IMPACT STATEMENT AND PLAN	58
LIST OF PREPARERS AND QUALIFICATIONS.	69

TABLE OF CONTENTS - Cont'd

TABLES:

- Table 1 - Estimated Installation Cost
- Table 2 - Estimated Cost Distribution - Structural Measures
- Table 3 - Structural Data - Dams With Planned Storage Capacity
- Table 3A - Structural Data - Dike System
- Table 4 - Annual Cost - Structural Measures
- Table 5 - Estimated Average Annual Flood Damage Reduction Benefits
- Table 6 - Comparison of Benefits and Costs - Structural Measures

APPENDICES:

- Appendix A - Display Accounts for Recommended Alternative
- Appendix B - Potential Floodwater Retarding Structure Sites Studied
- Appendix C - Letters of Comment
- Appendix D - Problem Location Map
- Appendix E - Urban Flood Plain Map
- Appendix F - Project Map

WATERSHED PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

ELM CREEK (1250) WATERSHED

Runnels and Taylor Counties, Texas

Abstract:

This document describes a plan for upland wildlife habitat management, and a system of floodwater dikes and floodwater retarding structures. Various combinations of these and other measures plus the no-action alternative were studied in detail to determine which combination would maximize project objectives. Economic benefits of the recommended alternative will exceed the cost of the project. Sponsors will pay 12.54 percent of the \$5,576,530 installation costs. Environmental impacts will include reduced erosion, reduced sedimentation, reduced flooding, increased acreage of prime farmland soils, a decreased amount of wildlife habitat, improved quality of the remaining habitat, and increased acreage of open water. In addition, the project will provide protection from the 100-year flood event to all residences and businesses in Ballinger that are in the Elm Creek flood plain. This document is intended to fulfill requirements of the National Environmental Policy Act and to be considered for authorization of Public Law 566 funding.

Prepared under the Authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001-1008) and in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 USC 4321 et seq).

Prepared by: City of Ballinger
City of Winters
Elm Creek Water Control District
Middle Clear Fork Soil and Water Conservation District
Runnels Soil and Water Conservation District
Runnels County Commissioners Court
Runnels County Water Authority
Taylor County Commissioners Court
U.S. Department of Agriculture, Soil Conservation Service

For more information, contact: George C. Marks, State Conservationist, Soil Conservation Service, P. O. Box 648, Temple, Texas 76501; telephone No. (817) 774-1214.

SUMMARY

This plan proposes: (1) Acceleration of technical assistance to land users in the improvement of upland wildlife habitat; (2) a system of seven floodwater retarding structures designed to reduce floodwater damage; and (3) a system of floodwater dikes designed to further reduce floodwater damage in the urban flood plain. The project is planned for installation during a 5-year period.

Elm Creek watershed consists of 238,253 acres in Runnels and Taylor Counties, Texas. Elm Creek rises in southern Taylor County and flows generally south to its confluence with the Colorado River near the city of Ballinger in Runnels County.

The 100-year flood event damages 15,480 acres and will inundate 113 residences, causing an apparent risk of loss of life. The average annual monetary loss caused by flood damage is estimated to be \$640,610. Intensive use of the natural resources has caused a deterioration of the quantity and quality of the indigenous fish and wildlife habitat.

The following candidate alternatives were studied in detail by the SCS and the project sponsors before an alternative was selected:

Alternative No. 1 - No project.

- 2 - Accelerated technical assistance in the management of upland wildlife habitat.
- 3 - A system of seven floodwater retarding structures plus floodwater dikes.
- 4 - A system of seven floodwater retarding structures plus a program of flood-proofing or acquisition of selected urban properties.
- 5 - A system of seven floodwater retarding structures, accelerated technical assistance in the management of upland wildlife habitat, and a system of floodwater dikes.

Alternative 1, no project action served as a basis for project formulation and also to measure the impacts of other alternatives. Alternative 2 emphasizes the environmental quality objectives. Alternative 3 emphasizes contributions to the national economic development objectives. Alternative 4 employs non-structural measures in lieu of structural measures to eliminate the apparent threat to life from the 100-year flood event in the watershed. Alternative 5 is the recommended alternative. It is a combination of the environmental quality alternative (No. 2) plus the national economic development alternative (No. 3). Other alternatives, consisting of various numbers and arrangements of floodwater retarding structures, were studied and eliminated because of less favorable economic considerations with no overriding environmental effects. An additional alternative which included a storage reservoir for municipal water was studied but was not included in the plan because the sponsors opted to install the needed water supply as a separate project.

Economic, environmental, and social impacts of the five alternatives are shown in the "Summary Comparison of Alternatives."

The project will require the use of 1,141 acres for the structural measures (dikes, spillways, dams, and the resulting sediment pools). It will affect 24 significant archeological sites. Mitigation measures are planned to reduce the adverse impacts. The project will also cause a net increase of 1,050 acres of prime farmland soils because of removal of the flood hazard on benefited flood plain lands.

USDA SOIL CONSERVATION SERVICE
PLAN AND ENVIRONMENTAL IMPACT STATEMENT^{1/}
for
Elm Creek (1250) Watershed
Runnels and Taylor Counties, Texas

INTRODUCTION

The watershed plan and environmental impact statement for this project have been combined into a single brief document. The document will provide the basis for authorizing federal assistance for implementation, as well as identify all known environmental impacts.

The sponsoring local organizations which developed the plan are as follows:

City of Ballinger, Texas
City of Winters, Texas
Elm Creek Water Control District
Middle Clear Fork Soil and Water Conservation District
Runnels Soil and Water Conservation District
Runnels County Commissioners Court
Runnels County Water Authority
Taylor County Commissioners Court

The Soil Conservation Service of the U.S. Department of Agriculture provided assistance to the sponsors in the development of the plan. Numerous other federal, state, and local agencies provided input into the planning process. Responsibility for compliance with Section 102(2)(C) of Public Law 91-190 rests with the Soil Conservation Service.

All data used in evaluating and establishing future conditions in the watershed were based on recent history and rainfall and streamflow gauge records. Flood-free agricultural production estimates were based on local records of farm and ranch units under an average level of management. A benefit-cost ratio of 1 to 1 was computed without consideration of any projections. Therefore, the uncertainty aspects of projections for project justification are insignificant.

AFFECTED ENVIRONMENT^{2/}

The watershed consists of 238,253 acres, or 372.27 square miles, in Runnels, Taylor, and Coleman Counties in West Central Texas. The small portion in Coleman County is not directly affected by project action (Appendix F).

^{1/} All information and data, except as otherwise noted by references to source, were collected during watershed planning investigations by the Soil Conservation Service.

^{2/} Detailed resource data pertinent to understanding key economic, environmental, and social factors are presented under the "Environmental Consequences" section.

Elm Creek, the principal watershed drainage, rises in the Cretaceous hills along the northern and eastern boundaries of the watershed and flows generally south to its confluence with the Colorado River near the city of Ballinger.

The watershed is in the Edwards Plateau and the Rolling Plains Land Resource Areas. Three distinctive landscape types comprise the watershed: (1) Undulating to steep limestone hills make up about 15 percent of the watershed; (2) nearly level to gently undulating outwash plains make up about 78 percent of the watershed; and (3) the nearly level flood plain makes up about 7 percent of the watershed. For a detailed description of the soils, see Soil Survey Runnels County, Texas, United States Department of Agriculture, Soil Conservation Service, March 1970; Soil Survey Taylor County, Texas, United States Department of Agriculture, Soil Conservation Service, December 1976, and the Environmental Assessment Summary Report, Elm Creek Watershed, Soil Conservation Service, September 1976.

Climatic conditions are semi-arid. About two-thirds of the annual precipitation, which averages 22 inches, falls during the period from April through September. The average growing season extends from March 30 to November 13, a period of 228 days (Texas Almanac, 1977). The average annual gross lake evaporation is 82 inches. About two-thirds of the annual lake evaporation occurs during the period of May through October (Texas Water Development Board, Report 192).

Surface water resources for livestock and domestic uses are from farm ponds, intermittent streams, and reservoirs such as Lake Winters, Old Lake Winters, Lake Graham, and Elm Creek Lake. These resources, as presently developed, do not provide a dependable water supply for municipal, domestic, and livestock uses. Water flows or remains in potholes in the lower part of Elm Creek and in Bluff Creek, except during droughty seasons. The watershed is drained by about 53 miles of intermittent streams and 580 miles of ephemeral streams.

The 1978 Stream Evaluation Map, State of Texas, published by the U.S. Fish and Wildlife Service, Office of Biological Services, Denver, Colorado, rates the lower portions of Elm Creek and Bluff Creek as "Value Class IV - Limited Value Fishery Resource." This rating is applied to aquatic habitat that is not used or is sporadically or unpredictably used by species of high interest.

Other streams in the watershed are ephemeral and do not provide a significant aquatic habitat. Because of siltation, most of the existing water impoundments do not provide quality fishery resources.

Many species of wildlife have been adversely affected by the conversion of rangeland to cropland and other land management practices during the early part of this century. In some areas, overgrazing by livestock has reduced valuable forage plants and increased competition for remaining plants between livestock and wildlife. Because wildlife species are generally less adaptable to stress conditions and changes in diet than are domestic livestock, reduced wildlife populations have occurred.

The 1930 census of Runnels County shows a population of 21,821 and this population decreased steadily to 12,108 in 1970. The population of Taylor County, which was 41,023 in 1930, increased steadily until 1960 when the population was 101,078. The 1970 population was 97,853 (Texas Almanac, 1977). The largest portion of the Taylor County population is concentrated in the city of Abilene and is not directly affected by the Elm Creek watershed. The watershed population, with the exception of Ballinger and Winters, is rural.

There are 168 minorities (Spanish American and Black) who live in the area that will be flooded by the 100-year flood event. Many of these people have suffered loss of property and have experienced a threat to life from floodwaters.

The economy of the watershed is based mainly on agriculture and petroleum products. There are about 650 farms or ranches in the watershed. The average size unit is about 400 acres.

Lands in the watershed are mainly in private ownership. Approximately 385 landowners in the watershed are receiving assistance from the Middle Clear Fork Soil and Water Conservation District and the Runnels Soil and Water Conservation District in applying needed soil and water conservation measures. Active farm plans cover about 65 percent of the watershed area.

There are an estimated 92,790 acres of prime farmland soils in the watershed. About 63 percent of the prime farmland soils is used for cultivated crops and 37 percent is used for rangeland. Other lands in the watershed have inherent limitations such as soil depth, slope, stoniness, or frequent flooding. Except for the hazard of frequent flooding, it is considered impractical to remove these limitations.

The land use of the watershed is shown in the following table:

<u>Land Use</u>	<u>Present</u> (Acres)	<u>Estimated</u> <u>Future (20 Years)</u> <u>Without Project</u> (Acres)
Cropland	108,450	101,210
Pastureland	4,490	9,290
Rangeland	112,434	112,953
Other ^{1/}	<u>12,879</u>	<u>14,800</u>
Total	238,253	238,253

^{1/} Other land includes urban, water, and built-up areas, farmsteads, cemeteries, roads, and miscellaneous areas.

The following list shows the acreage of each of the major crops produced in the watershed:

Small grain	53,000 acres
Forage sorghum	23,000 acres
Grain sorghum	18,500 acres
Cotton	2,000 acres
Idle cropland	11,950 acres

The areas of idle cropland were not in cultivation when the land use assessment was made but are normally used for cropland. Likewise, some areas cropped during the current season will be idle during the following season. A few of the areas are temporarily idle because of the flooding problem, but most are idle because of financial or labor problems.

Coastal bermudagrass and kleingrass are the main grasses used in the intensively managed pastureland. Coastal bermudagrass is used on about 95 percent of the pastureland in the watershed.

Natural plant communities, when in climax condition, have a savannah or prairie vegetative aspect. The predominant native grasses in the watershed are little bluestem, sideoats grama, buffalograss, curlymesquite, and tobosa grass. Grass species that are prevalent when in climax or excellent condition are big bluestem, indiagrass, switchgrass, and blue grama. Live oak trees grow in scattered motts, but seldom represent more than 5 to 10 percent of the plant community. Other woody plants such as mesquite, lotebush, tasajillo, agarito, catclaw acacia, post oak, shin oak, and redberry juniper occur in the watershed.

Of the 15,480 acres in the 100-year flood plain, areas totalling about 1,000 acres have vegetation comprised mainly of woody species such as live oak, elm, sugar hackberry, bumelia, and a few pecan trees. Much of the area that had similar vegetation under climax condition was cleared and cultivated by early-day settlers. These 1,000 acres with woody vegetation occur in narrow, broken bands along the major streams. These areas are considered streamside woody habitat that is of special value to wildlife. It is presently used as rangeland.

Many species of forbs and legumes add color to the watershed and variety to the diet of animals. These forbs and legumes include engelmannndaisy, maximilian sunflower, penstemon sp., halfshrub sundrop, bundleflower, sensitivebrier, prairieclover, paintbrush, bluebonnet, gaura, and verbena sp.

The watershed is underlain by sedimentary rocks of Permian, Cretaceous, and Quaternary ages. The Permian rocks, which include the Lueders Formation and formations of the Clear Fork Group, occur under most of the watershed. These rocks are dominantly soft shale interbedded with thin units of hard limestone and dolomitic limestone. The Cretaceous rocks occur as outliers on the Permian beds forming the prominent mesas in the upper part of the watershed. These rocks include steep, slope-forming, moderately hard limestone capped by hard limestone and basal soft sandstone. The Quaternary rocks occur as broad sheets of outwash deposits covering large areas of the Permian beds and as alluvium in bands up to one-half mile wide along Elm Creek and the major tributaries.

Petroleum and natural gas are the main mineral products of the watershed. Average annual production of these minerals in Runnels County is \$6.5 million. In Taylor County, the average annual production of oil, gas, stone, clay, sand, and gravel is \$13.6 million (Texas Almanac, 1977).

Outdoor recreational opportunities in the watershed are limited mainly to hunting. Marginal fishing and waterfowl hunting are provided at Lake Winters and Elm Creek Lake. Camping, picnicking, and other field sports activities are limited to the Ballinger city park, Lake Winters park, and privately owned lands. Most residents of the watershed depend on facilities at nearby lakes for water-based recreation. Lakes within 25 miles of the watershed that have public recreational facilities include Hords Creek Reservoir, Lake Coleman, and Clyde Lake. Lakes within 50 miles of the watershed are Lake Nasworthy, Twin Buttes Reservoir, Lake Brownwood, and E. V. Spence Reservoir.

Archeological studies were made at the proposed structure sites by the Archeology Research Program, Department of Anthropology, Southern Methodist University, under contract with the Soil Conservation Service. The studies, which were published in a report entitled Archeology Research Program Research Report 106, described 33 sites that can contribute to the understanding of local history and prehistory. The report stated "The cultural resources which will be affected by this proposed project may contribute to furthering the local interest in the past, despite the fact that the resources are not likely to attract large numbers of tourists or warrant the development of a major archaeological park." The report recommended that 9 of the 10 areas surveyed be nominated "as a district" to the National Register of Historic Places.

Visual resources of the area are composed of the basic landscape elements: landform, vegetation, and structures. Dominant landforms are nearly level undulating to steep hills in the upper parts of the watershed. Dominant land use is cropland and rangeland. About one-half of the cropland is vegetated with small grains which provide a green color contrast during the winter months. Summer growing crops of grain sorghum give a rich brown hue to the landscape during the late summer. Grasses on the rangeland are dominantly straw colored with brush and shrubs being dark gray-green. Woody vegetation is mainly low-growing brushy mesquite or shinnery oak. Scenic values in the watershed are generally low to average.

WATERSHED PROBLEMS

Land and Water Management Problems

Technical assistance in applying soil conservation measures is being provided by the Soil Conservation Service through the Middle Clear Fork and the Runnels Soil and Water Conservation Districts. This on-going program of assistance, with excellent cooperation of local land-users, is adequate to maintain an acceptable level of protection from upland erosion. However, problems with flood plain scour, streambank erosion, and sedimentation are beyond the scope of the on-going conservation programs.

Erosion Problems

About 85 percent of the watershed is adequately protected against erosion by vegetative cover and/or other conservation measures. The on-going program of technical assistance provided by the soil and water conservation districts and the present staff of professional conservationists of the Soil Conservation Service is expected to maintain this level of protection. About 15 percent of the watershed is mismanaged, causing a high rate of soil loss. As the eroded areas are treated, other areas are mismanaged and start eroding at a high rate. The 85 percent level of adequately protected land is considered to be an acceptable level of protection.

Sheet and rill erosion on the upland portion of the watershed accounts for 88 percent of the erosion in the watershed. Flood plain scour and stream bank erosion account for the remaining 12 percent.

The tolerable rate of erosion in the watershed is the maximum rate of erosion that will permit a high level of production to be sustained indefinitely and depends primarily on the depth of the soil. Thus, shallow soils have an allowable rate of soil loss of 1 to 3 tons per acre annually and deep soils have an allowable rate of 5 tons per acre annually. The most serious erosion problem occurs on cropland. The following table summarizes the erosion rates on the cropland portion of the watershed:

EROSION PROBLEM ON CROPLAND

Soils With Tolerable Rate :	Acres With Soil Loss Rate of ^{1/} -				
of Annual Soil Loss of -	1 to 3	3 to 5	5 to 8	8 to 11	11 to 14
1 Ton	12,400	1,200	200	-	-
2 Tons	-	300	-	-	-
3 Tons	-	850	-	-	-
5 Tons	-	-	3,350	450	500

^{1/} Tons Per Year

About 12,000 acres of pastureland and rangeland are eroding at rates slightly higher than tolerable. These acres are not adequately protected but do not pose a serious problem. About 300 acres are eroding at a critical rate. These are mainly 1- to 5-acre areas scattered throughout the watershed. They are being treated with conservation measures through the on-going program.

Flood plain scour is damaging an average of 4,750 acres annually. Scouring ultimately results in abandonment of the land from agricultural use. Damage in terms of reduced productivity of the flood plain soils ranges from 5 to 50 percent.

Concentrations of runoff water flowing into well-defined stream channels and high velocity flows in the channels are causing erosion of the stream-banks mainly in the lower parts of the watershed. The estimated average annual monetary damage of streambank erosion and flood plain scour is \$99,050.

Sediment Problems

An estimated 518,800 tons of soil are displaced by erosion in the watershed each year. About 80 percent of this displaced soil is deposited within the watershed: at the bases of slopes, at the mouths of gullies, on alluvial plains, or in stream reservoirs. The remaining 20 percent is carried out of the watershed in sediment-laden water.

Large volumes of sediment have been deposited on the flood plain and in the stream channels and lakes. Sediment accumulations have damaged the productivity of 2,445 acres. The average annual damage is \$40,130.

Lake Winters has lost about 25 percent of its storage capacity to sedimentation, as indicated by a 1970 Soil Conservation Service reservoir sedimentation survey. However, the sedimentation rate for Lake Winters appears to be on a level with that for other planned sites within the watershed. Therefore, the reduced storage capacity is probably a reflection of insufficient allocation of storage for sediment in the original structure and does not indicate a high sediment source.

The estimated average amount of sediment carried out of the watershed is 102,700 tons annually. This volume results in an estimated average concentration of 2,635 milligrams per liter in the estimated 28,700 acre-feet of average annual runoff at the mouth of the watershed.

Floodwater Problems

Damages to crops and pastures on flood plain lands are extensive throughout the watershed. Crops are often destroyed by floodwater, but a significant portion of the damage is related to delayed planting and harvesting, with resultant increases in the cost of producing the crop and decreases in crop yields and quality of the product. These damages have forced operators to manage flood plain land well below the actual potential of the soils, resulting in reduced yields and incomes.

Floodwater damage occurs on 15,480 acres of flood plain land along Elm Creek and its tributaries. This is the flood plain that would be inundated from a 100-year frequency event. A table showing the acres flooded and the monetary damage caused by various size storm events is in the "Environmental Consequences" section of this report. At the present time, land use in the flood plain is about 51 percent cropland, 22 percent pastureland, 26 percent rangeland, and 1 percent other land such as urban

land, water, built-up areas, and other miscellaneous areas. Flooding results from high-intensity, short-duration thunderstorms that usually occur during the spring and summer; however, flooding may occur during any season. The degree of damage varies, depending on the season of the year that flooding occurs.

High-intensity rains cause rapid runoff from the strongly sloping and slowly permeable soils. This rapid runoff causes flash flooding of downstream bottomlands and severe damages to crops, pastures, fences, farm improvements, livestock, public roads, bridges, and the urban area of Ballinger.

Flooding may occur at any time and usually results in severe damage, greatly reducing the effectiveness of management practices and associated monetary inputs. The estimated average annual direct monetary damage by floodwater to crops and pastures is \$173,050. Estimated other agricultural damage is \$72,440. This includes floodwater damages to other farm improvements and loss of livestock.

Floodwater damage to roads and bridges in the watershed is major. The following table shows the length of roads and number of bridges that are subject to damage from the 100-year flood event. The table also shows the present value of these roads and bridges:

VALUE AND EXTENT OF ROADS AND BRIDGES SUBJECT
TO FLOODWATER DAMAGE
(100-Year Flood Event)

Item	: Extent or Number :	Present Value
<u>Rural Roads</u>		
Gravel	11,300 feet	
Asphalt	900 feet	\$ 144,500
<u>City Streets</u>		
Gravel	22,000 feet	\$ 220,000
<u>Bridges</u>		
Wooden	12	
Steel	6	
Concrete	4	
Low water crossings	4	\$3,000,000
Total value of transportation system subject to floodwater damage		\$3,364,500

Repair of floodwater damage to these roads and bridges consists of: (1) Removing debris such as boulders, logs, and sediment; (2) reshaping road grade, shoulders, and borrow ditches; (3) replacing base materials; (4) re-vegetating road drainage ditches and embankments; (5) repairing structural damage to bridges; and (6) repairing bridge abutment damages. Other expenses incurred because of this type of road and bridge damage include the cost of labor, equipment, and materials. To repair damages to the transportation

system in these areas affected by floodwater damage requires an average annual expenditure of \$241,820. This figure is based on the average cost of restoring the improvements damaged by floodwater to their before-damage condition.

There are 113 residences which are subject to floodwater damage from the 100-year flood event. (See Appendix E - Urban Flood Plain Map.) Investigations indicate that the maximum depth of flooding inside any residence will be 4.1 feet from a 100-year flood event. This depth of floodwater is considered to be an apparent risk of loss of life. The estimated average annual direct monetary damage of urban properties is \$14,120.

The following table is a summary of floodwater depths in occupied residences from a 100-year flood event under present conditions:

SUMMARY OF FLOODWATER DEPTHS
RESIDENCES
(100-Year Flood Event)

Floodwater Depth In Structure	Number of Structures
0 to 1 foot	30
1 to 3 feet	62
3 to 4 feet	19
4 to 4.1 feet	2
Total	113

Frequent flooding also causes agricultural flood plain lands to be utilized below their potential. Farm and ranch operators are not able to establish improved management practices to any significant extent on 6,181 acres of the flood plain inundated by the 25 percent chance storm event.

Fish and Wildlife Problems

There are several factors which limit species diversity and populations of fish and wildlife in the Elm Creek watershed. The shortage of permanent water limits wildlife drinking water as well as fisheries habitat and waterfowl resting areas.

Brush control measures applied in past years without regard to wildlife needs have reduced the quality of wildlife habitat in some areas. Conversely, in other areas, selective brush clearing is needed to open dense canopies of mesquite and lotebush for animal travel.

In some areas, overgrazing by livestock has reduced valuable forage plants and increased competition for remaining plants between livestock and wildlife. Since wildlife species are generally less adaptable to stress conditions and changes in diet than are domestic livestock, reduced wildlife populations have occurred.



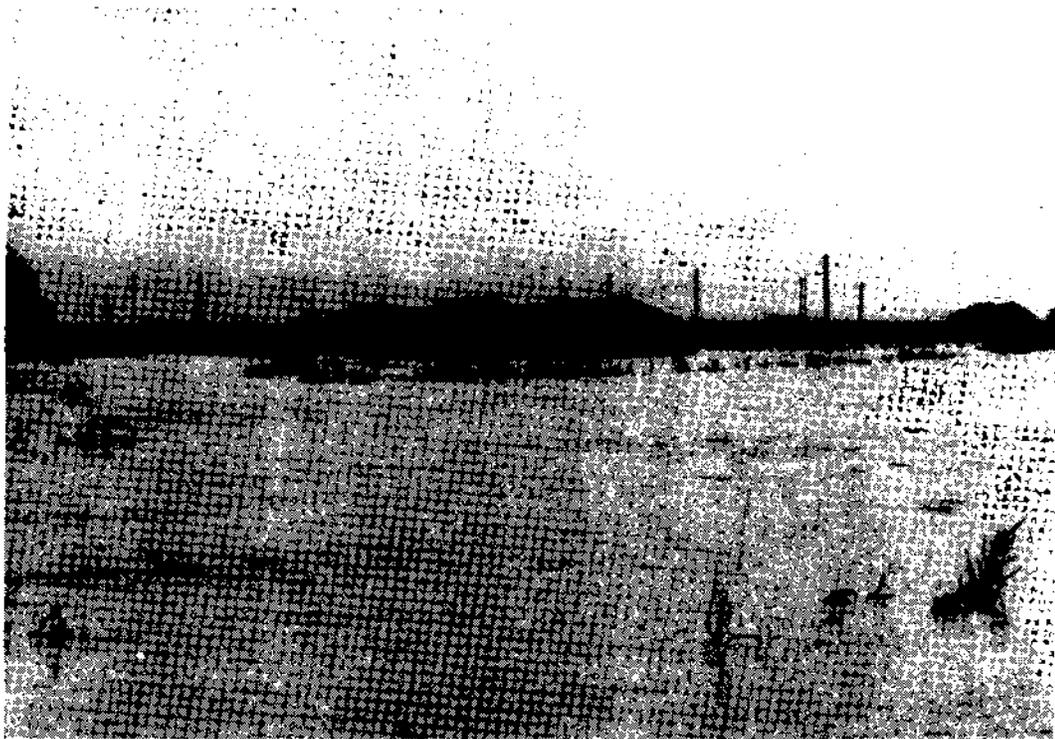
Floodwater damage occurs on 15,480 acres of floodplain land along Elm Creek and its tributaries. Damages to crops and pastures are extensive. Crops are often destroyed by floodwater, but a significant portion of the damages is related to delayed planting and harvesting, with resultant increases in the cost of producing the crop and decreases in crop yield and quality of the product.



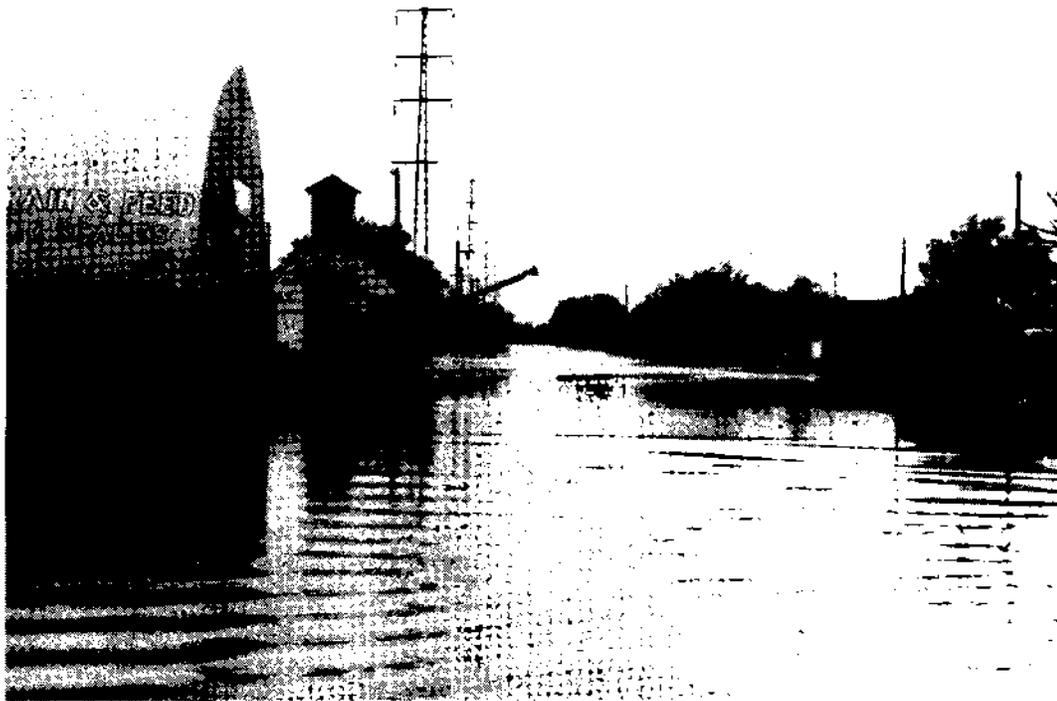


Erosion of streambanks caused by swift-flowing floodwater is a serious problem in the watershed.

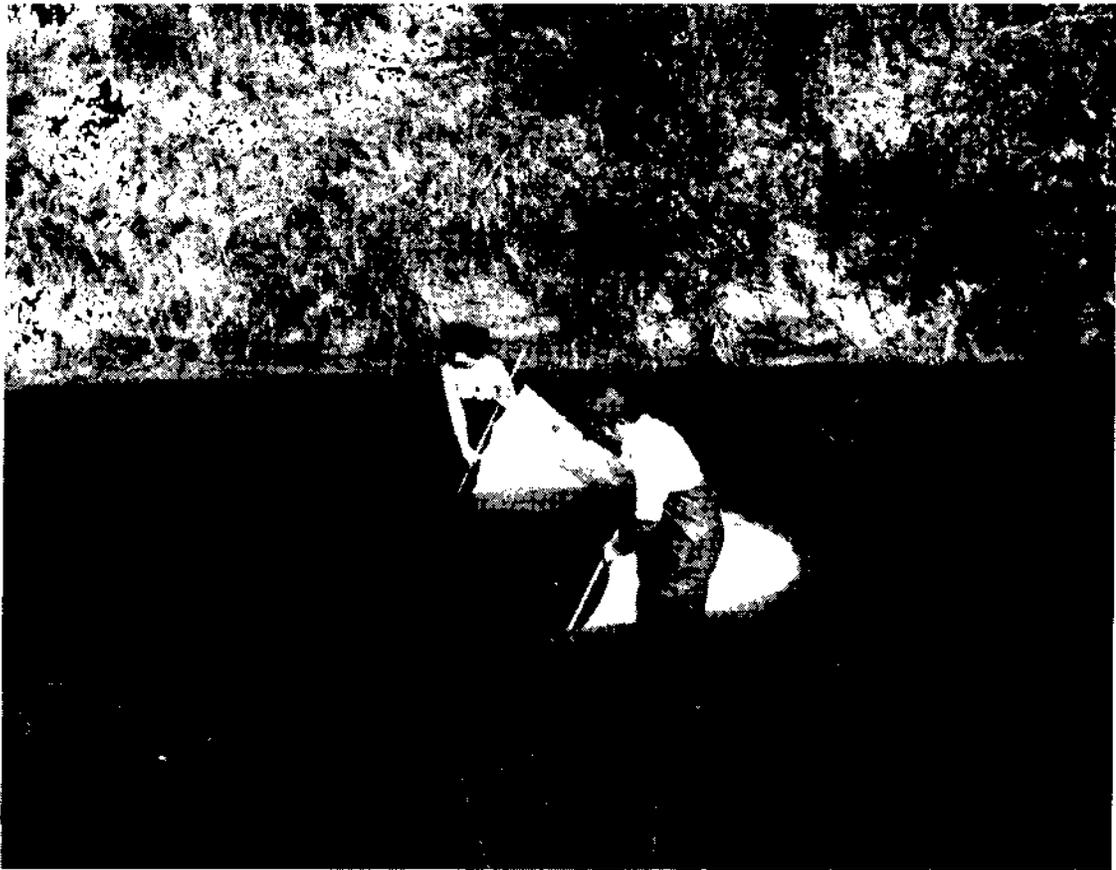




The U.S. Government housing project in Ballinger has been damaged by flooding of Elm Creek. These residences will be inundated 1.2 feet deep as a result of the 100-year rainstorm. A storm of this magnitude will cause floodwater depths of up to 4 feet in other residences in the watershed. More than 100 buildings or residences in the watershed are subject to flood damage.



Floodwater damage to roads in the watershed is major. About 22,000 feet of city streets, 12,200 feet of rural roads and 26 bridges are subject to floodwater damage from the 100-year flood event.



Biologists studied Elm Creek and other streams in the watershed to evaluate the present fishery resource and to help predict the effects of the project on the biological resources.



Biologists with the Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, and Soil Conservation Service cooperated in the study of the fish and wildlife habitat in the watershed and made recommendations for the improvement of the environmental quality.

Consideration of the wildlife resources has not been included in the management plan of many landusers. This has contributed materially to the above described deterioration of wildlife habitat. The lack of wildlife habitat consideration in management also restricts recovery of this resource.

Ground Water Quality

Excessive nitrate in the ground water resources has caused cattle deaths in the watershed. A serious occurrence of cattle deaths in the late 1960's precipitated studies by numerous local, state, and federal agencies. The studies concluded that the high nitrate concentration was "natural nitrate... whose occurrence cannot be attributed to activities of man and that the most probable source of this natural nitrate is degradation of vegetation" (Texas Water Development Board).

In addition to the nitrate problem, approximately 770 acres in the watershed are severely affected by salty seep water. Studies made by state agencies found that the surface disposal of brine in oil production activities was effectively stopped by the Runnels County No-Pit Order dated June 27, 1966. The Texas Railroad Commission concluded that residual salt from past pit disposal practices may still be a source of some contamination. Treatment of the salty seep water is beyond the scope of a Public Law 566 project.

The Choza Formation of the Clear Fork Group, Permian Age, and Recent alluvium yields fresh to moderately saline water in small to moderate quantities to wells in the watershed.

Municipal and Industrial Water

The cities of Ballinger and Winters, like most small communities in this region of the state, have marginal or inadequate water supply sources to meet their needs. Both cities need additional supplies to meet their projected demands.

PROJECT GOALS

The following goals were identified by the sponsoring local organizations in consultation with interested agencies, groups, and individuals:

National Economic Development

1. Increase agricultural production by:
 - (a) reducing floodwater damages on agricultural land; and
 - (b) reducing sediment deposition in watershed streams, lakes, and flood plains.
2. Improve fishery resources and wildlife habitat in order to increase value of hunting and fishing leases.

3. Decrease monetary loss resulting from floodwater damage to urban properties and roads and bridges.
4. Eliminate the floodwater-related threat to life.

Environmental Quality

1. Maintain or improve the physical-biological balance of nature by:
 - (a) preventing unnecessary reduction of streambank hardwoods;
 - (b) avoiding damage to cultural resources of national significance;
 - (c) reducing erosion rates on flood plain land; and
 - (d) improving surface water quality by reducing the sediment load in streams and lakes.
2. Create areas of open water which will provide:
 - (a) a fishery resource in the watershed and
 - (b) a resting and feeding area for waterfowl.
3. Add to the diversity of habitat for various species of wildlife now residing in the watershed or species that can be enticed to come into the watershed.
4. Enhance areas of natural beauty by creating diversity of visual resources and adding unique areas of open water.

PROJECT FORMULATION

The local people have been aware of the existing flood hazards for many years. In the early 1960's, formally organized groups began to show interest. Local individuals and groups gathered data on flood damage and other problems.

In 1967, formal application was made to the Secretary of Agriculture for assistance in planning and carrying out works of improvement under Public Law 566, the Watershed Protection and Flood Prevention Act (PL 566). The supporting local organizations were the two soil and water conservation districts, the two commissioners courts, the cities of Winters and Ballinger, and the Runnels County Water Authority. All civic clubs in the watershed endorsed the project. A steering committee was appointed to create a water control district by an act of the state legislature. The Elm Creek Water Control and Improvement District became the lead sponsor in carrying out local obligations under PL 566. In response to the application for assistance from the sponsoring local organizations, the Soil Conservation Service made a field examination in May 1973 to determine the feasibility of project action.

This examination indicated that plan elements authorized by PL 566 to reduce flood damage and protect the resources could be installed with a favorable benefit-cost ratio. These elements included land treatment, floodwater retarding structures, multiple-purpose structures, and channel work.

A preliminary investigation was made in May 1973. The physical data, economic data, fish and wildlife resources, recreational resources, archaeological and historical values, unique scenic areas, and the status of soil, water, and plant management were evaluated.

Representatives of the Bureau of Sport Fisheries and Wildlife (now the Fish and Wildlife Service) of the Department of the Interior, the Texas Parks and Wildlife Department, and the Soil Conservation Service participated in the preliminary investigation. Based on their findings, it did not appear that the project would have severe adverse impacts on the fish and wildlife resources as long as proper consideration was given to the resources during project formulation.

The preliminary investigation verified the probable economic feasibility and environmental acceptability. Authorization for planning assistance was given in June 1973 and planning began in August 1973.

An environmental assessment was made by an interdisciplinary team in July 1975. The team consisted of soil conservationists, biologists, soil scientists, a geologist, an economist, and an engineer from the Soil Conservation Service and representatives of the Fish and Wildlife Service and the Texas Parks and Wildlife Department.

Meetings with the sponsors and the public were held during the planning process to coordinate, evaluate, exchange information, and reach agreements on a system of measures that would serve the needs of the people and protect and improve the watershed resources. At least 8 public meetings and 22 meetings with sponsors since 1973 have allowed the public to participate in selecting project goals and elements of the proposed project. Newspaper articles and radio and television programs have generated public awareness.

The following environmental quality objectives were provided by the Fish and Wildlife Service planning aid input:

Environmental Quality Objective 1: Protect wildlife habitat of the watershed which has been or is expected to be severely reduced in the future or which has special value to wildlife resources of the watershed.

Environmental Quality Objective 2: The primary objective for terrestrial wildlife habitats (streamside woodlands, brushlands, grasslands, and croplands) is to improve the value of all habitat types in the watershed.

Environmental Quality Objective 3: The primary objective for aquatic habitat (streams, ponds, and lakes) is to improve the value of all habitat types in the watershed. This objective can be accomplished if the land-owners will include aquatic habitat management in their farm and ranch management plans.

Along with these objectives, the Fish and Wildlife Service also provided specific components of each of the objectives.

These objectives and their components coincide with the SCS standards and specification for assisting landusers in carrying out upland wildlife habitat management on their lands.

A fourth objective recommended by the Fish and Wildlife Service for utilizing the wildlife resources involved providing public access to private lands. This objective is not included as part of this project.

Recommendations to reduce impact of project construction on fish and wildlife resources also were solicited from the Fish and Wildlife Service and the Texas Parks and Wildlife Department. These recommendations and their disposition are discussed under "Consultation." Project formulation was continued by listing those measures installable under PL 566 which would achieve or could be expected to satisfy one or more of the project goals. An analysis was made of the impact of identified measures on each of the goals. Each measure was first evaluated in relation to its impact on each goal under the National Economic Development objective. Then each measure was evaluated relative to its impact on each goal under the Environmental Quality objective. The following tables summarize the results of this analysis:

PLANNING CONSIDERATIONS 1/

OBJECTIVE	MEASURES STUDIED										
	Effect	Land Treatment	Acquiring	Relocating	Nonstructural	Structural	Technical Assist	Flood-proofing	Urban Properties	Dikes	Retarding Structures
Maintain or Improve the Physical-Biological Balance of Nature By:											
Prevent Unnecessary Reduction of Streambank Hardwoods	0	1	0	0	0	0	0	0	0	0	-
Avoiding Damage to Cultural Resources of National Significance	0	0	0	0	0	0	0	0	0	0	+
Reducing Erosion Rates on Flood Plain Land	+	0	0	0	0	0	0	0	0	0	+
Improving Surface Water Quality by Reducing Sediment Load	+	0	0	0	0	0	0	0	0	0	+
Create Areas of Open Water Which Will Provide:											
A Fishery Resource	0	0	0	0	0	0	0	0	0	0	+
A Resting and Feeding Area for Waterfowl	0	0	0	0	0	0	0	0	0	0	+
Add Diversity of Wildlife Habitat	+	+	0	0	0	0	0	0	0	0	+
Enhance Areas of Natural Beauty	0	+	0	0	0	0	0	0	0	0	+

1/ Degree of Effect: + Beneficial
 0 None or Insignificant
 - Adverse

PLANNING CONSIDERATIONS I/

OBJECTIVE	MEASURES STUDIED					
	Effect : Land Treatment :	Relocating :	Acquiring :	Flood proofing or :	Structural :	Structural :
NATIONAL ECONOMIC DEVELOPMENT						
Increase Agricultural Production By:						
Reducing Flooding	+	0	0	0	0	+
Reducing Sedimentation	+	0	0	0	0	+
Increase Opportunity for Income From Fish and Wildlife Resources By:						
Creating or Improving Fish and Wildlife Habitat	+	+	0	0	0	+/-
Protect Lives, Homes, and Other Non-Agricultural Structures By:						
Reducing Floodwater Damage to Roads and Bridges	+	0	0	0	0	+
Eliminating the Floodwater-Related Threat to Life	0	0	+	+	+	+

I/ Degree of Effect: + Beneficial
 0 None or insignificant
 - Adverse

Inspection of the tables reveals that each of the elements will satisfy one or more of the project objectives.

Various systems of floodwater retarding structures and floodwater dikes were analyzed to determine how flood prevention needs could be best met. A study of geology, topography, hydrology, and the environment revealed 15 locations which appeared to be suitable for a conventional floodwater retarding structure (appendix B). Five of these sites were eliminated from consideration without detailed study for obvious cost-benefit deficiencies. One of the remaining 10 sites was considered for a multiple-purpose structure and is discussed in more detail below. Structure sites 1 and 2 and 4 and 5 are in series. Larger structures, 2A and 5A, at the lower site location in each series were investigated as alternate systems. The increased cost and land rights involvement and the loss of intervening benefits proved 2A and 5A to be less cost effective than 1 and 2 and 4 and 5.

Economic studies, using incremental analyses, were conducted. The analyses began with a system consisting of floodwater retarding structures Nos. 1, 3, and 4. Structures 2 and 5 were added as the second increment. Next, structures Nos. 6 and 7 were added incrementally. Then structure No. 9 was added as a last increment. This was the first increment that did not increase the net benefits. Structure No. 9 was dropped and structure No. 10 added as a last increment. This increment also failed to increase net benefits.

The system of seven floodwater retarding structures left remaining floodwater depths of up to 2 feet in 15 residences from the 100-year flood event. Two feet of floodwater inside a residence is considered to indicate an apparent risk of loss of life. A system of nine floodwater retarding structures was analyzed to determine its effects on the apparent risk of loss of life. This apparent risk was eliminated, with an accompanying reduction in net benefits. A primarily nonstructural alternative consisting of seven floodwater retarding structures plus flood-proofing or acquisition of selected flood plain properties was studied to determine if the project goals, including the elimination of the apparent risk of loss of life, could be accomplished. The primarily nonstructural alternative would eliminate the apparent risk of loss of life but would reduce net benefits compared to the system of seven floodwater retarding structures. Additional studies revealed that a system of floodwater dikes in combination with the seven floodwater retarding structures could be installed and would protect all occupied residences in the Elm Creek flood plain from the 100-year flood event. The seven-structure system plus a system of floodwater dikes maximized net benefits and eliminated the threat of loss of life.

The Cities of Winters and Ballinger jointly retained the engineering firm of Freese and Nichols to do a preliminary study of possible municipal water storage sites in the watershed. In January of 1975, Freese and Nichols submitted their report to the cities. The report identified four possible sites within the watershed. Two had serious water quality problems. Only one of the structures was within the limits for SCS participation (maximum total storage of 25,000 acre-feet).

The cities pursued the larger, more favorable site independent of the Elm Creek project. In February 1977 it appeared that monies and permits were about in order for the two cities to build a structure for municipal water storage. In June of 1977 it was determined that the

joint effort was not eligible for a grant that represented a substantial part of the proposed project financing. The City of Ballinger began to look outside the watershed for a water source.

The City of Winters retained Henningson Durham & Richardson, Inc. to assist them. A study was made at Site N (the upper location identified by Freese and Nichols approximately one mile downstream from Winters' present lake). The maximum yield available at Site N is 900 acre-feet/year. Winters' anticipated demand was projected by their engineering consultant as 1,100 acre-feet/year. The present Winters Lake provides a firm yield of 425 acre-feet/year. This is a part of the 900 acre-feet maximum yield above. The structure under study would increase the available water by only 475 acre-feet annually.

The engineering firm recommended the investigation of Lake Spence and Coleman City Lake as possible water sources. The City of Winters preferred a structure on Elm Creek. On November 11, 1977, the planning staff met with the City of Winters and their consultants. Of major concern to the city was how timely would SCS financial assistance be if the project were eligible and they chose to participate.

After several months of study, the City of Winters opted to try to install a structure on Elm Creek at Site N without PL-566 assistance. They propose to have this structure under construction before the Elm Creek plan is authorized. The city's consultant is developing the design based on the Elm Creek Watershed Plan being installed, giving due consideration to its impacts on sediment and water yields.

Incremental economic analysis of the possible structure systems for this project revealed that a single purpose floodwater retarding structure at Site N would not be a part of the NED plan, so no economic or technical conflict exists with the City of Winters' plan.

It was mutually agreed by the sponsors and the SCS not to include municipal water as a purpose in this plan. Project elements are described in more detail in the "Planned Project" section of this report.

ALTERNATIVES

Alternative plans considered during formulation include a national economic development plan, an environmental quality plan, and a primarily nonstructural plan.

The national economic development plan is directed toward increasing the value of the Nation's output of goods and services and increasing national economic efficiency. Project contributions are measured in dollars. The environmental quality plan is directed toward maintaining or improving the natural physical-biological system in which all life, including human life, is sustained. Elements evaluated in determining alternative plans were various systems of structural measures, nonstructural measures, and land treatment measures.

The alternatives considered during planning are described below. Economic, environmental, and social impacts believed to be of greatest significance to decision making are presented in the "Summary Comparison of Alternatives" (page 20).

Alternative 1 - This alternative consists of foregoing implementation of the project. This alternative was studied to determine if the favorable impacts of the preferred plan could be achieved at a lesser environmental cost and also to provide a base for determination of impacts of the other alternatives.

Alternative 2 - This alternative is the EQ plan and consists of accelerated technical assistance in the management of upland wildlife habitat. A professional wildlife biologist would provide technical guidance and encouragement to landusers to create or improve the indigenous wildlife habitat. The main purpose would be to add to the diversity and quality of habitat for various species of wildlife now residing in the watershed or species that can be enticed to come into the watershed. While this alternative emphasizes environmental quality it would also add to the economic development of the area by increasing the value of hunting, fishing, and recreational leases.

Alternative 3 - This alternative optimizes contributions to the national economic development objective. It consists of a system of seven floodwater retarding structures and a system of floodwater dikes. Included in this alternative are elements specifically designed to offset losses of terrestrial habitat and important cultural resources resulting from installation of the seven floodwater retarding structures. The floodwater dikes would be designed to protect homes and buildings from the 100-year storm event.

Alternative 4 - This alternative is the primarily nonstructural plan and consists of a system of seven floodwater retarding structures plus a program of flood-proofing or acquiring selected urban properties. Flood-proofing would be installed on residences which have a remaining flood threat of more than one foot in depth from the 1 percent chance flood event with the seven floodwater retarding structures in place. Specific properties may be purchased if acquisition is less costly than flood-proofing. These nonstructural measures would be installed in lieu of two floodwater retarding structures or the system of floodwater dikes and would be designed specifically to eliminate the flood-related threat to life.

Alternative 5 - This alternative is the recommended alternative and consists of a system of seven floodwater retarding structures, accelerated technical assistance in the management of upland wildlife habitat, and a system of floodwater dikes. It is a combination of Alternative 2, which is the environmental quality plan, and Alternative 3, which is the national economic development plan.

After analyzing all of the possible combinations of plan elements, it was determined that only Alternative 5 was both acceptable to the sponsors and implementable under the authority of the SCS. Alternatives 1 and 2 do not satisfy project goals of national economic development. Alternative 3 maximizes national economic development goals but does not satisfy

environmental quality goals. Alternative 4 eliminates the apparent risk of loss of life but would require relocation of some residents from the flood plain. This social and economic impact is unacceptable to the City of Ballinger. Alternative 5 was recommended because it met the sponsors' goals relating to flood prevention and the goals of improving the environmental quality of the watershed.

SUMMARY COMPARISON OF ALTERNATIVES
Elm Creek (1250) Watershed, Texas

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	(No Project)	(Environmental Quality)	(National Economic Development)	(Primarily Non-Structural)	(Recommended)
Goals	No Project	Land Treatment	7 FRS + Dikes	7 FRS + Floodproofing + Acquisition	7 FRS, Floodwater Dikes + Land Treatment
National Economic Development					
Project Installation Cost	0	223,000	5,353,530	5,747,320	5,576,500
Average Annual Cost	0	16,460	445,140	474,200	461,600
Average Annual Benefits	0	Environmental Quality	567,160	558,770	567,160 + Environmental Quality
Net Benefits	0	Environmental Quality	122,620	84,570	105,560 + Environmental Quality
Total Acres Flooded					
1 Percent Chance (Acres)	15,480	15,480	13,472	13,554	13,472
Average Annual (Acres)	5,581	5,581	2,781	2,782	7,781
Sedimentation	No Reduction	No Reduction	34% Reduction	34% Reduction	34% Reduction
Environmental Quality					
Wildlife Resource	No Improvement	Improve Habitat on 80,000 Acres	No Improvement	No Improvement	Improve Habitat on 80,000 Acres
Prime Farmland (Acres)	No Increase	No Increase	+ 1,050	+ 1,050	+ 1,050
Streamside Woody Habitat	No Reduction	No Reduction	Reduction of 67 Acres	Reduction of 67 Acres	Reduction of 67 Acres
Archaeological Sites Affected	0	0	24	24	24
Social Well-Being					
Residences Flooded 1 Percent Chance (Number)	113	113	0	30	0
Remaining Apparent Risk to Loss of Life	Not Eliminated	Not Eliminated	Eliminated	Eliminated	Eliminated

PLANNED PROJECT

The project consists of acceleration of technical assistance in the management of wildlife habitat, installation of seven floodwater retarding structures, and a system of floodwater dikes. The project will be installed during a 5-year period.

Land Treatment

The planned land treatment consists of accelerated technical assistance to watershed landowners and/or operators. Decisions to apply land treatment rest with the landusers involved. Project assistance will be limited to those cases where the desires of the landusers are compatible with identified project goals.

The measure to be emphasized is wildlife upland habitat management, which consists of retaining, creating, or managing areas for food and shelter for wildlife. This measure will be applied by landusers who wish to improve the wildlife resources. A professional wildlife biologist will commit about one-half man-year annually to the watershed during the 5-year project installation period. Specific goals will be to provide on-site technical assistance to landusers.

The on-going program of technical assistance provided by the SCS through the soil conservation and water districts will not be affected by project action. The accelerated program provided by the project will supplement the on-going program with 2.5 man-years to be used in conservation planning and application assistance to landusers.

Landusers will be encouraged to incorporate the following measures in their land treatment program:

1. Leave small areas of grain fields unharvested.
2. Refrain from destroying woody vegetation in fence rows and other odd areas.
3. Protect riparian woody habitats and upland woody motts.
4. Consider wildlife needs in brush management programs by using practices such as strip-clearing.
5. Protect pastures and rangelands from overgrazing.

Standards and specifications for wildlife upland habitat management are in the field office Technical Guides in the local SCS offices assisting the conservation districts. This conservation land treatment practice is defined in the National Handbook of Conservation Practices.

Structural Measures

The planned structural measures consist of seven floodwater retarding structures and a system of floodwater dikes. Each floodwater retarding structure will consist of a dam or embankment with an emergency spillway, a principal spillway, a floodwater retarding pool, and a sediment pool (figure 1). The water in the retarding pool is released through the

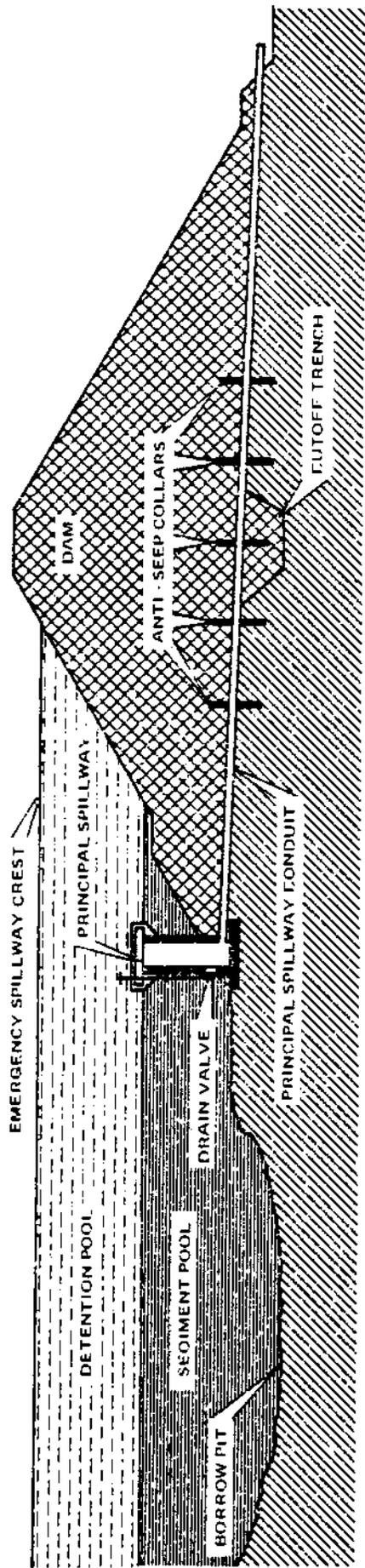


Figure 1

SECTION OF A TYPICAL FLOODWATER RETARDING STRUCTURE

principal spillway during a maximum period of seven days after inflow ceases. 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 at a non-erosive velocity. The sediment pool is the capacity below the principal spillway elevation allocated for the storage of submerged sediment.

The structures will control runoff from 138.14 square miles, or 39 percent of the delineated watershed. (See Appendix F for the locations of the seven structures.)

The total capacity allocated for the anticipated 100-year accumulation of submerged sediment is 4,397 acre-feet. The principal spillway crest will be set at the capacity of the 100-year sediment volume predicted to be deposited as submerged sediment. All principal spillways will be ported at the 200-acre-foot capacity, except floodwater retarding structure No. 2, which will be ported at the 66-acre-foot capacity to minimize the area of valuable streamside hardwoods and wildlife habitat that will be inundated. The principal spillways will be the drop inlet type with cantilever outlets. The inlets will be ungated to operate automatically, and will have provisions to release impounded water in order to perform maintenance and, if it becomes necessary, to avoid encroachment upon prior downstream water rights. The total floodwater retarding capacity of the floodwater retarding structures is 10,405 acre-feet, provided for in the space between the sediment pools and the emergency spillway crests.

The floodwater retarding structures will consist of earthen embankments. Geologic investigations reveal no unusual problems which will affect construction of the dams or spillways. Preliminary investigations indicate that the required amount of suitable borrow material is available below the elevation of the lowest ungated outlet. The borrow material will be excavated from as small an area as practical in order to minimize impacts to the area. The smaller borrow pit will assure smaller and deeper pool areas and will minimize the potential shallow water areas and exposed shorelines. Should additional borrow material be needed, a site selection will be made based on an interdisciplinary assessment of the impacts.

The floodwater retarding structures are classified according to the SCS system. The basic concept of the classification system is the potential hazard to life and property in the event of sudden dam failure. The following classes of dams are used: Class (A) where failure may damage farm buildings, agricultural land, or township and country roads; Class (B) where failure may damage isolated homes, main highways or minor railroads, or cause interruption of use or service of relatively important utilities, and; Class (C) where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, main highways, or railroads. Floodwater retarding structures Nos. 2 and 3 are Class "B" and Nos. 1, 4, 5, 6, and 7 are Class "A." The potential hazard determined was based on present and projected uses of the area downstream. Breach hazard information on these areas is available from the SCS and should be reviewed prior to any development to assure that development does not take place within the breach area. Development within the breach area will change the hazard classification of the structure.

The criteria for structure design are more stringent for the structures having a higher hazard potential. Aspects of this difference in criteria are demonstrated in the structural data (table 3); for example, the hydrologic criteria for establishing the planned top of dam (freeboard hydrograph, rainfall volume) are greater for a Class "B" structure than a Class "A." It should be noted that the volumes tabulated are for a 6-hour duration rainfall; for this duration the 100-year recurrence interval rainfall is approximately 6.15 inches and the maximum probable rainfall is approximately 28 inches. Comparisons of the design rainfall with these rainfalls indicate the risk of structure failure due to the dam being overtopped. Other possible causes of dam failure such as structural failure, stability failure, cracking, or seepage do not lend themselves to this type of risk-based analysis. Site conditions that might contribute to failure have been specifically identified and treated in the structure design by experienced people according to engineering and scientific principles.

The areas needed for construction of the dikes, 19 acres, and the dams and emergency spillways, 319 acres, will be cleared of all vegetation. All disturbed areas that are not subject to permanent inundation will be vegetated according to SCS technical specifications. These specifications include seeding with a mixture of native grasses such as buffalograss, sideoats grama, blue grama, and little bluestem or bluestem mixture. Species selected will be multi-use plants for erosion control, food and cover for wildlife, and improvement of the esthetic value of the landscape. A vegetative screen approximately 300 feet long will be planted and maintained adjacent to floodwater retarding structure No. 5 to mitigate the adverse impacts on the visual resources of one occupied farm house. All dams and emergency spillways will be fenced. Woody plantings may be made on selected areas of the floodwater dikes and other structure sites, if needed, to mitigate the adverse effect on the visual resource of the area.

Vegetation will be cleared for a distance of 400 feet upstream from the principal spillways. Woody vegetation which has value for wildlife habitat will be left undisturbed at every construction site unless it will create a hazard to proper functioning of the floodwater retarding structure or unless it must be removed for construction purposes. Specifically, woody vegetation will be left undisturbed in the upper reaches of the resulting water areas of floodwater retarding structures Nos. 2, 3, 4, 5, 6, and 7 (Appendix F). Site No. 1 is devoid of woody vegetation in the upper reaches of the pool area.

Fences will be constructed around areas of potentially valuable habitat in the sediment pools of floodwater retarding structures Nos. 1, 2, 6, and 7. The following areas will be fenced and managed for maximum environmental quality and optimum use by wildlife:

Structure No. 1 - 3 acres
Structure No. 2 - 7 acres
Structure No. 6 - 8 acres
Structure No. 7 - 10 acres

The fenced areas will be located to protect the shorelines of the sediment pools specifically to improve wildlife habitat and water quality. Livestock will be excluded from all fenced areas, except when grazing will benefit the vegetation. Grazing will be by written permission of the Elm Creek Water Control District.

The system of floodwater dikes is designed to restrict the flow of Elm Creek floodwater from the urban portions of Ballinger and three residences east of Ballinger. The dikes, in combination with the floodwater retarding structures, will provide protection from the 100-year storm event. The dikes will consist of earthen embankments with an average height of 5.5 feet with side slopes of three to one. Outlet pipes will be used for interior drainage of the protected area.

The environment will be protected from soil erosion and water and air pollution during construction by requiring contractors to adhere to strict guidelines set forth in each construction contract. 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 minimum practical limits. Haul roads and 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 and stored safely in protected areas, and disposal at work sites will be by approved methods and procedures. All equipment used in construction will conform to SCS Construction Safety Standards and Interpretations. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable laws, ordinances, and regulations. Disposal of brush and vegetation will be by burying, hauling to approved off-site locations, adequately anchoring in sediment pools, or controlled burning, as applicable. Each contract will set forth specific stipulations to prevent uncontrolled grass or brush fires.

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 the federal, state, and local water pollution control regulations. Conformance to all environmental control requirements will be monitored by a construction inspector who will be on-site during all periods of construction operation. During construction periods, the structure sites will be open and available for monitoring by federal, state, and local regulatory agencies to allow adequate monitoring of water and air pollution.

Efforts will be made to avoid creating conditions which will increase populations of vectors which affect public health conditions. Prevention and control measures will be implemented, if needed, in cooperation with

appropriate federal, state, and local health agencies to suppress proliferation of vectors such as aquatic insects, terrestrial arthropods, rodents, etc., that could occur during installation of the structures.

The sediment pools of the seven floodwater retarding structures are expected to hold water. The problems, expenses, and liability associated with the landowners' opening their property to public use limit the acceptance of this activity. The cost of additional land rights acquisition for recreational use exceeds the financial ability of the sponsors. Therefore, the sponsors do not plan to assure public access to any of the structures and public recreation use will be prohibited at all seven sites. If public access is ever provided at any of the sites, the sponsors will assure that adequate sanitary facilities in compliance with public health laws are installed prior to making the areas available for public use.

Information supplied by the Corps of Engineers indicates that installation of the planned structures is covered by a nationwide permit issued under the authority of Section 404 of the Federal Water Pollution Control Act Amendment of 1972. No other federal or state permit is needed.

A field survey and evaluation of archeological resources in the watershed indicated that a number of significant archeological sites would be disturbed or inundated by project action. The seven planned floodwater retarding structures will disturb or inundate 24 significant archeological sites. The survey and the resulting report were made by the Department of Anthropology, Southern Methodist University (Report 106) under contract with the Soil Conservation Service in 1978. The report recommended mitigation by salvage of the 24 affected archeological sites at an estimated cost of \$116,580. Prior to construction, SCS will follow through under its appropriate regulations (7 CFR 656) and request the National Park Service to implement the mitigation plan. The SCS considers that implementation of this recovery plan constitutes no adverse effect on the cultural properties. The State Historic Preservation Officer and the Advisory Council On Historic Preservation have concurred in the determination of no adverse effect. If additional archeological or historical resources not previously located and evaluated are encountered during construction, work will cease in those areas and the Soil Conservation Service will immediately consult with the State Historic Preservation Officer and the Interagency Archeological Service to determine whether there is evidence to warrant a detailed survey and recovery. If the evidence is substantive, the National Park Service will be requested to perform immediate surveys and recovery. Should the evidence be inconclusive, construction will continue with caution.

Under present conditions, there will be no apparent displacements or relocations of persons, businesses, or farm operations as a result of installation of the project. If relocations or displacements become necessary, they will be carried out under the provisions of Public Law 91-646, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and will be cost-shared as follows: Soil Conservation Service, 87.46 percent; sponsors, 12.54 percent.

INSTALLATION COSTS - MONETARY

Total installation cost of the project (Table 1) is estimated to be \$5,576,530, of which \$4,877,090 will be borne by Public Law 566 funds, \$537,950 will be borne by local sponsors, \$80,000 will be borne by land users for the installation of planned accelerated land treatment measures, and \$81,490 will be borne by the National Park Service for cultural resource salvage.

Public Law 566 costs for technical assistance in the application of land treatment measures are estimated to be \$143,000. The cost of applying land treatment measures will be borne by the users of the land on which the measures are applied. Cost-share assistance for the application of land treatment measures is available through other USDA programs such as the Agricultural Conservation Program and the Great Plains Conservation Program. Long-term loans for the purpose are available through commercial lending institutions and programs of the USDA Farm and Home Administration.

Public Law 566 costs for the structural portion of the project (Table 2) are estimated to be \$4,734,090, which consists of \$3,862,640 for construction, \$308,330 for engineering services, \$35,090 for cultural resource salvage, and \$528,030 for project administration. Local costs for the structural portion of the project are estimated to be \$537,950, which consists of \$533,450 for the value of the land rights and \$4,500 for project administration.

Local costs for project administration include the sponsors' costs related to contract administration, overhead and organization administrative costs, and whatever construction inspection they desire to make at their own expense. The value of land rights was determined in cooperation with representatives of the sponsoring local organizations.

Construction costs include the engineer's estimate and contingencies. The engineer's estimate is based on current unit cost of structural measures in similar areas modified by special conditions inherent to the site location. Ten percent of the engineer's estimate was added as a contingency to provide funds for unpredictable construction costs. No unusual construction problems are anticipated.

Engineering services and project administration costs are based on an analysis of previous work in similar areas. Engineering services costs consist of, but are not limited to, detailed surveys, geologic investigations and laboratory analyses, reports, designs, and cartographic services.

The cost for cultural resource salvage is based on estimates made by the Department of Anthropology, Southern Methodist University, who made the cultural resource survey under contract with the SCS. The Heritage Conservation and Recreation Service (HCRS) will be responsible for funding that portion of the required salvage which exceeds one percent of Public Law 566 construction cost.

Public Law 566 project administration costs consist of construction inspection, contract administration, and maintenance of SCS records and accounts.

The total average annual cost of the project (amortized total installation and project administration costs including interest of 7.375 during the project installation period plus annual operation and maintenance costs) is \$445,140. Project measures are expected to produce average annual benefits of \$567,160. The ratio of total annual project benefits accruing to the structural measures to the average annual cost of the structural measures is 1.3 to 1.0 (table 6). The ratio of average annual benefits without intensification to average annual cost is 1.0 to 1.0.

INSTALLATION AND FINANCING

The project installation period will be five years. The general sequence of installation is shown in the following Schedule of Obligations:

SCHEDULE OF OBLIGATIONS

Elm Creek (1250) Watershed, Texas

Fiscal Year	Measure	Public Law 566 Funds	Other Funds	Total (Dollars)
1st	Land Treatment ^{1/}	28,600	16,000	44,600
	Acquisition of Land Rights	0	257,870	257,870
	Subtotal for Structural Measures			257,870
2nd	Land Treatment ^{1/}	28,600	16,000	44,600
	Acquisition of Land Rights	0	257,870	257,870
	Engineering Services	125,520	0	125,520
	Resource Salvage	35,090	81,490	116,580
	Project Administration	31,590	450	32,040
	Subtotal for Structural Measures			532,010
3rd	Land Treatment ^{1/}	28,600	16,000	44,600
	Engineering Services	98,000	0	98,000
	Project Administration	205,780	1,450	207,230
	Floodwater Retarding Structures 1, 3, 4	1,540,370	0	1,540,370
	Subtotal for Structural Measures			1,845,600
4th	Land Treatment ^{1/}	28,600	16,000	44,600
	Engineering Services	77,850	0	77,850
	Project Administration	171,250	1,000	172,250
	Floodwater Retarding Structures 2, 5	1,306,880	0	1,306,880
	Subtotal for Structural Measures			1,556,980
5th	Land Treatment ^{1/}	28,600	16,000	44,600
	Acquisition of Land Rights (Dikes)	0	17,700	17,700
	Engineering Services	6,960	0	6,960
	Project Administration	119,420	1,600	121,020
	Floodwater Retarding Structures 6, 7	945,730	0	945,730
	Floodwater Dikes	69,660	0	69,660
	Subtotal for Structural Measures			1,161,070
TOTAL		4,877,090	699,440	5,576,530

^{1/} One-fifth of the accelerated land treatment and corresponding technical assistance.

This schedule may be changed from year to year to conform with appropriations, accomplishments, and any mutually agreed-to changes.

The Elm Creek Water Control District will have the following responsibilities pertaining to the project:

1. Provide assistance to landusers and operators in the application of the planned land treatment practices. Encourage landowners and operators to maintain the land treatment practices.
2. Obtain agreements from landusers of not less than 50 percent of the land above each reservoir and floodwater retarding structure that they will carry out conservation farm or ranch plans on their land. A minimum of 50 percent of the land upstream from each floodwater retarding structure will be adequately protected from erosion prior to construction of the dam.
3. Acquire necessary land rights for all floodwater retarding structures consistent with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and USDA Rules and Regulations (Title 7, Part 21). It is planned to obtain all needed land rights during the first two years for the floodwater retarding structures. The district will cooperate with the City of Ballinger in acquiring the needed land rights for that portion of the dike system outside the Ballinger city limits.
4. Acquire or provide assurance that landusers or water users have acquired water rights pursuant to state law as may be needed in the installation and operation of the structural measures.
5. Provide for the change in location or modification of utility lines, roads, structures, etc., and all permits necessary for the installation of the structural measures. Modification will be required at each site as follows:

Modification of Existing Improvements		
Site:		: Estimated
No.:	Improvement	: Modification
		: Cost
		(dollars)
1	2 Oil Wells	850
	1 Powerline (permit only)	50
	Subtotal	900
2	Telephone Cable Above Detention Pool (permit only)	50
	R.E.A. Powerline (permit only)	50
	Subtotal	100
3	No Improvements	0
4	No Improvements	0
5	Powerlines	5,000
	Subtotal	5,000
6	No Improvements	0
7	10 Powerline Poles	2,500
	2 Barns and Abandoned House	1,000
	Subtotal	3,500
	Total	9,500

All costs for modifications as listed are land rights costs and will be borne by the sponsors. Two oil wells at Site No. 1 will be elevated to protect against inundation.

6. Execute operation and maintenance agreements.

The City of Ballinger will have the responsibility to acquire necessary land rights for the dike system consistent with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and USDA Rules and Regulations (Title 7, Part 21). It is planned to obtain all needed land rights for the dikes in the fifth year of the installation period. The Elm Creek Water Control District will cooperate with the City in acquiring needed rights outside the city limits.

The sponsors have the right of eminent domain under applicable state law and have the financial resources to fulfill their responsibilities.

Technical assistance will be provided by the SCS in preparation of plans and specifications, construction inspection preparation of contract payments, estimates, final inspection, execution of certificate of completion, and related tasks necessary to install the planned structural measures.

The sponsors have requested the SCS to issue invitations for bids and award and administer the contracts for installation of the works of improvement.

The significant archeological sites which were identified during the environmental assessment of the watershed will be nominated to the National Register of Historic Places. The estimated cost for salvaging these archeological resources is \$116,580. The National Park Service will be responsible for funding salvage which exceeds one percent of Public Law 566 construction cost of each measure that affects archeological resources.

OPERATION, MAINTENANCE, AND REPLACEMENT

The Elm Creek Water Control District will be responsible for the operation and maintenance of the floodwater retarding structures. Funds for this purpose will be made available from the general operating funds of the district. The estimated average annual cost of operation and maintenance of the floodwater retarding structures is \$4,690. The City of Ballinger will be responsible for operation and maintenance of the floodwater dikes. Funds for this purpose will be available from the general operating funds of the city. The estimated average annual cost of operation and maintenance of the floodwater dikes is \$380.

Upon completion of the floodwater retarding structures and the floodwater dikes by the contractor, subject to the establishment of vegetation, the sponsors will assume responsibility for maintenance of the structures and areas fenced for mitigation of wildlife habitat. They will perform promptly, or have performed promptly, all maintenance as determined to be needed by either the sponsors or the SCS, including that required to prevent soil erosion and water pollution. Fertilization and weed control will be carried out to establish, as well as maintain, a good vegetative cover. The dams, emergency spillways, and selected areas adjacent to the sediment pools will be fenced. Fences will be maintained.

A specific operation and maintenance agreement will be prepared for the structural measures and will be executed prior to signing a project agreement and the issuance of invitations to bid on construction of the structural measures. The operation and maintenance agreement will include specific provisions for retention and disposal of property acquired or improved with Public Law 566 financial assistance. The agreement will set forth specific details on procedure in line with recognized assignments of responsibility and will be in accordance with the Texas Watersheds Operation and Maintenance Handbook.

The sponsors will make inspections of the structures annually during the first three years after construction, and after major storms, or other unusual conditions that might adversely affect the measures. The sponsors are responsible for continuing inspections after the third year. They are

to prepare a report and send a copy to the SCS employee responsible for O&M inspections and followup. In addition, the SCS will establish a systematic inspection procedure. Inspections made by the SCS will (1) review hazard classifications; (2) assess the adequacy of current O&M activities; (3) identify unsafe conditions; (4) specify means of relieving unsafe conditions; (5) notify those who are responsible; and (6) encourage prompt corrective action if necessary. To the maximum extent possible, the SCS inspections will coincide with the inspections made by the sponsors.

The sponsors will also control the handling, use, and application of any herbicides and pesticides that may be needed for operation and maintenance of the structural measures. If the use of chemicals should be required, only approved and authorized reagents and compounds will be used. Their applications will be compatible with current laws regulating their use. In addition to prudent judgment, ordinances and standards concerned with the disposal or storage of unused chemicals, empty containers, contaminated equipment, etc., will be observed and applied.

The SCS will participate in operation and maintenance only to the extent of furnishing technical assistance to aid in inspections and technical guidance and information necessary for the operation and maintenance program.

Provisions will be made for unrestricted access by representatives of the sponsors and the SCS to inspect the structural measures and their appurtenances and areas fenced and designated as wildlife mitigation areas at any time and for the sponsors to perform operation and maintenance. Easements insuring this unrestricted ingress and egress will be furnished by the sponsors.

ENVIRONMENTAL CONSEQUENCES

A broad range of environmental, economic, and social factors was considered during the environmental assessment process. Areas of potential impact were evaluated and an analysis made of the significance of the impact to decisionmaking. Following is a list of major economic, environmental, and social factors that were studied during project planning and the degree of impacts expected from project action:

ANALYSIS OF IMPACTS

<u>Economic, Environmental, and Social Factors</u>	<u>Degree of Impact</u> ^{1/}	<u>Significant to Decisionmaking</u>	<u>Remarks</u>
Floodwater	Major	Yes	
Erosion & sedimentation	Major	Yes	
Land use & flora	Minor	Yes	
Prime agricultural land	Minor	Yes	
Streams and lakes	Minor	No	
Ground water	None	No	
Wildlife habitat	Moderate	Yes	Mitigation necessary
Fish	Minor	Yes	
Surface water quality	Minor	Yes	
Endangered & threatened plants & animals	None	No	None present
Transportation	Major	Yes	
Economy, employment, & the minority population	Major	Yes	
Air quality	Minor	No	
Mineral resources	None	No	
Cultural resources of national significance	Major	Yes	Mitigation necessary
<u>Visual Resources</u>	Minor	No	Mitigation necessary

^{1/} Analysis used to establish scope and intensity of assessment of impacts and the detail with which the environmental impact statement addressed the impacts.

A description of the project impacts is presented below. Appropriate baseline data has been included to establish needed perspective. Areas of impact believed to be of key importance to decisionmaking are summarized for the various alternatives in the "Summary Comparison Table" and in the four account display of the recommended alternative.

Floodwater

Floodwater damage occurs on 15,480 acres of flood plain land along Elm Creek and its tributaries. Agricultural land, roads, bridges, urban land, etc., are affected by flooding. For a more complete description of the floodwater damages, see the "Watershed Problems" section of this report.

Appendix E shows the urban flood plain. Investigations indicate that 113 residences will be flooded with depths of up to 4.1 feet from the 100-year flood event. This is considered to be an apparent risk of loss of life.

Impacts. Installation of the project will reduce the acres flooded from the 100-year flood event from 15,480 acres to 13,472 acres. It will provide protection from the 100-year flood event to all existing urban properties in Ballinger that are in the Elm Creek flood plain.

The following tabulation shows the actual floodwater damages by reaches for the selected recurrence intervals:

Evaluation Reach (Appendix D)	AREA AFFECTED BY FLOODWATERS PER STORM EVENT					
	Annual Chance of Occurrence Per Storm Event					
	1 Percent		4 Percent		25 Percent	
Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
R- 1	940	558	529	205	160	63
R- 2 ^{1/}	370	326	331	179	197	0
R- 3	1,150	930	969	600	479	141
R- 4	2,935	2,552	2,597	1,311	1,568	138
R- 5	350	350	245	245	78	78
R- 6	1,250	918	946	538	447	170
R- 7	737	737	501	501	150	150
R- 8	1,065	1,065	933	933	242	242
R- 9 ^{2/}	1,898	1,820	1,605	1,323	748	522
R-10 ^{3/}	145	13	114	0	15	0
R-11	804	745	720	609	368	190
R-12	942	942	729	729	224	224
R-13	2,260	2,031	1,940	1,746	1,280	865
R-14	634	485	426	354	225	183
Total	15,480	13,472	12,585	9,273	6,181	2,966

1/ Includes only the area below floodwater retarding structure No. 3.

2/ Includes only the area below floodwater retarding structure No. 6.

3/ Includes only the area below floodwater retarding structure No. 7.

The frequency method was used in calculating average annual monetary damages (Economics Guide for Watershed Protection and Flood Prevention).

The average annual monetary floodwater damages will be reduced from \$501,430 to \$165,110, or 67 percent. The following tabulation shows the average annual acres flooded and average annual floodwater damages:

AVERAGE ANNUAL ACRES FLOODED AND AVERAGE ANNUAL FLOODWATER DAMAGES

Reach	Without Project		With Project	
	Acres	Dollars	Acres	Dollars
1	156	\$ 11,400	63	\$ 4,450
2	152	15,280	15	2,300
3	355	16,950	141	5,350
4	1,297	265,200	212	51,800
5	69	10,040	69	10,040
6	414	24,450	145	7,050
7	156	10,200	156	10,200
8	228	6,120	228	6,120
9	853	27,500	487	14,900
10	19	14,450	1	480
11	259	14,900	123	8,000
12	294	9,920	294	9,920
13	1,107	42,800	683	28,800
14	222	32,220	164	5,700
TOTAL	5,581	\$501,430	2,781	\$165,110

Installation of the project will allow farm and ranch operators to establish and maintain improved management practices on 3,215 acres protected from flooding. These management practices, such as increased fertilization rates, application of herbicides and insecticides, and conversion to higher value crops, are expected to occur on 2,390 of the 3,215 acres. It is estimated that this intensification will increase net income to land users by \$124,730 annually.

Erosion

About 85 percent of the watershed is adequately protected against erosion by vegetative cover and/or other conservation measures. About 15 percent of the watershed is mismanaged, causing a high rate of soil loss.

Flood plain scour and streambank erosion caused an estimated average annual damage of \$99,050.

An estimated 518,800 tons of soil are displaced by erosion in the watershed each year. About 20 percent of this displaced soil material is carried out of the watershed in sediment-laden water.

Impacts. The on-going program of conservation planning and application assistance to land users is expected to maintain the 85 percent level of protection against erosion.

Installation of the floodwater retarding structures will reduce flood plain scour and streambank erosion. The estimated average annual monetary damage from flood plain scour and streambank erosion will be reduced from \$99,050 to \$43,870.

Sedimentation

Erosion in the upland portions of the watershed causes sedimentation of streams and lakes. Deposition of sediment in Lake Winters has reduced the water storage capacity by about 25 percent. When sediment is deposited on land areas it reduces the productive capacity of the soil. Surveys show that 2,445 acres in the flood plain have been damaged by sediment. About 102,700 tons of sediment are washed out of the watershed each year.

Impacts. Installation of the seven floodwater retarding structures, when completed, will reduce downstream deposition of sediment on the flood plain and in the reservoirs. The amount of sediment delivered downstream from the watershed will be reduced from 102,700 tons (2,635 mg/l) annually to 68,000 tons (1,745 mg/l), a 34 percent reduction. The estimated average annual monetary damage of overbank deposition will be reduced from \$40,130 to \$22,240.

Land Use and Prime Farmland Soils

Land use in the watershed is about 46 percent cropland, 2 percent pastureland, 47 percent rangeland, and 5 percent other land consisting of urban land, roads, farmsteads, etc. About 49 percent of the cropland is planted to small grain, 21 percent to forage sorghum, 17 percent to grain sorghum, and 2 percent to cotton. In any given year, about 11 percent of the cropland is idle.

There are an estimated 92,790 acres of prime farmland in the watershed. Prime farmland is land that is best suited for producing food, feed, fiber, and forage crops and is also available for these uses (the land could be cropland, pastureland, rangeland, or other land but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Impacts. Installation of the project will result in minor adjustments in land use and associated plant communities. Principal changes in land use will be limited to construction areas. The following table shows the impact of the installation of the planned structural measures on land use in the watershed. The estimated future land use is based on studies made during the interdisciplinary team assessment of the watershed. The areas directly affected by the project were computed after engineering studies were made on the size of the structural measures and the resulting pool areas.

Land Use	: Estimated Future (20 Years):			: Direct : Effect of : Project
	: Present : Condition (acre)	: Without : Project (acre)	: With : Project (acre)	
Cropland	108,450	101,210	100,795	- 415
Pastureland	4,490	9,290	9,340	+ 50
Rangeland	112,434	112,953	112,626	- 327
Other (except water) ^{1/}	11,979	13,700	14,022	+ 322
Water	900	1,100	1,470	+ 370
Total	238,253	238,253	238,253	

^{1/} Includes urban and built-up areas, roads, farmsteads, etc. It also includes the areas required for the dams and spillways of the structural measures of this watershed project.

The total area affected by installation of the seven floodwater retarding structures and two dikes is 2,161 acres. The following tabulation shows the present land use of the area which will be affected:

Item	: TOTAL LAND AREA AFFECTED :				: Total (acre)
	: Crop- : land (acre)	: Pasture- : land (acre)	: Range- : land (acre)	: Other (acre)	
Dams & Spillways	133	0	185	^{1/} 1	319
Sediment Pools Below Lowest Ungated Outlet ^{2/}	96	0	235	^{1/} 1	332
Sediment Pools Above Lowest Ungated Outlet	183	2	281	^{1/} 5	471
Floodwater Deten- tion Pools ^{3/}	529	16	467	^{1/} 8 ^{4/} 8	1,020
Floodwater Dikes	3	0	0	^{4/} 16	19

^{1/} Water areas.

^{2/} 200 acre-foot capacity except floodwater retarding structure No. 2 which will be ported for the purpose of preserving wildlife habitat.

^{3/} Crest of emergency spillway.

^{4/} Miscellaneous land consisting of a narrow band adjacent to urban or built-up areas.

The 319 acres needed for construction of the dams and emergency spillways will be cleared of all vegetation. The dams and emergency spillways will be vegetated after construction with selected multi-use plants. The 332-acre portions of the sediment pool areas below the elevation of the lowest ungated outlets will initially store water. This 332 acres plus the 471-acre portions of the sediment pool areas above the lowest ungated outlets will fill with sediment over a period of about 100 years. Land

in the floodwater detention pool areas (1,020 acres) will be affected by periodic inundation. Land use in this area may or may not be changed depending on the frequency of inundation.

The project will adversely affect about 1,200 acres of prime farmland soils by permanent or periodic inundation or by converting it to dams and spillways. However, the project will eliminate the frequent flooding hazard on about 2,250 acres that would be prime farmland except for its frequently flooded condition. Thus, the project will create a net increase of 1,050 acres of prime farmland. The following list shows the present and expected future acreage of prime farmland soils:

	<u>Acres of</u> <u>Prime Farmland Soils</u>
Present condition	92,790
Area directly affected by project	1,200
Acres made prime by project	2,250
Total acres of prime with project	93,840
Net increase	1,050

Streams and Lakes

Surface water resources for livestock and domestic uses in the area are from small farm ponds, intermittent streams, and reservoirs such as Lake Winters, Old Lake Winters, Lake Graham, and Elm Creek Lake. The total area of surface water is about 900 acres.

The major streams in the watershed are Elm Creek and Bluff Creek. There are about 53 miles of intermittent streams and 580 miles of ephemeral streams in the watershed. Intermittent streams, as used here, are those that have continuous flow through some seasons of the year but little or no flow through other seasons. Ephemeral streams are those that flow only during periods of surface runoff.

Impacts. Construction of the floodwater retarding structures will result in the loss of 6.5 miles of intermittent streams. These areas will be replaced by the creation of 332 acres of surface water. Installation of the structures will also cause a change in the flow regime of the affected streams in the watershed. During periods of runoff, the depth, velocity, and duration of out-of-channel flows will be reduced downstream from the structures. The duration of low flows (within channel) will be increased. The project will cause an initial reduction of 0.9 percent in average annual streamflow from the watershed. These estimates are based on an anticipated 5.7 percent reduction in average annual streamflow at the structure sites which will control 29.3 percent of the drainage area above the USGS gage on Elm Creek in Ballinger. The magnitude of the 5.7 percent reduction at the structure sites will diminish downstream from the structures because part of the flow is lost into the streambed.

Wildlife Habitat

There are two types of terrestrial wildlife habitat in the watershed, bottomland (approximately 33,000 acres or 14 percent) and upland (approximately 205,000 acres or 86 percent). The area considered as bottomland habitat in the watershed is that area that supports woody vegetation or other typical bottomland vegetation, or that supported bottomland vegetation when in climax condition. Hardwoods such as cedar elm, american elm, western soapberry, woollybucket bumelia, black willow, osageorange, texas mulberry, plum, honeylocust, and sugar hackberry grow in narrow bands along creeks where adequate moisture is available. Other woody vegetation growing in the bottomland habitat includes honey mesquite, lotebush, catclaw acacia, and pencil cholla. The wooded stream courses, interspersed throughout the watershed, are not typical bottomlands (due to the absence of certain bottomland hardwood species), but do provide essential bottomland habitat elements. The cropland in the bottomland area consists of monocultures of cool season small grains or warm season row crops. Fence rows, turn rows, and odd areas support herbaceous vegetation.

The woody plants that occur on the upland areas are mesquite, lotebush, tasajillo, agarito, catclaw acacia, prickly pear, and a few post oak, shin oak, and redberry juniper on the upper end of the watershed. Of the rangeland portion of the upland, 50 percent has less than 10 percent woody canopy, 48 percent has 10 to 30 percent woody canopy, and 2 percent has more than 30 percent woody canopy. Although the land is grazed by cattle, sheep, and goats, it does provide habitat for whitetailed deer and various species of furbearers and birds.

The cropland acreages of the uplands consist of intensively farmed monocultures of warm season row crops and cool season drilled crops. A limited amount of wildlife food and cover is provided by fence rows, odd areas, grassed waterways, and waste grain. Pasturelands are mainly coastal bermudagrass or kleingrass which provide very low value for wildlife.

Impacts. The land treatment portion of the project consists of accelerated technical assistance for wildlife habitat management practices on 80,000 acres through application of measures specifically designed for the benefit of wildlife. Habitat management has been applied on 9,500 acres of cropland and 34,000 acres of rangeland. Objectives of the project are to increase this acreage to 44,500 acres of cropland and pastureland, and 90,000 acres of rangeland. Wildlife habitat will be created, maintained, and improved by land users with technical assistance by a professional wildlife biologist. Improved habitat will increase the quantity and quality of wildlife species now inhabiting the watershed and may entice other adapted species to come into the area. Upland wildlife habitat rating on the 80,000 acres will increase by an estimated 2 points on a 10-point scale when these planned practices are applied.

The wildlife habitat rating value on the land committed to the structural measures of this project will increase by six percent. This increase is a result of converting the land area in the sediment pools to water. The

majority of the increase comes from providing habitat for aquatic life. The remaining increase is from creating a source of surface water for terrestrial species. Under present conditions, the lack of surface water is a limiting factor for wildlife habitat.

About 584 acres of upland wildlife habitat and 67 acres of bottomland wildlife habitat will be destroyed or significantly altered by construction of the dams, emergency spillways, and the resulting water areas. Construction of the dams and emergency spillways will require 319 acres, which consist of 133 acres of cropland, 43 acres open rangeland, 124 acres of brushy rangeland, 18 acres of streamside woody habitat, and 1 acre of open water (pond). The existing vegetation will be destroyed and replaced with vegetation that is suitable for erosion control and wildlife food. The areas expected to be inundated with permanent water (the lowest ungated outlet areas) will require 332 acres, which consist of 96 acres of cropland, 56 acres of open rangeland, 130 acres of brushy rangeland, 49 acres of streamside woody habitat, and 1 acre of open water (pond). Vegetation in the sediment pool areas will be cleared as necessary to obtain borrow material. Specific areas of woody vegetation at Sites 2, 3, 4, 5, 6, and 7 will be protected from clearing to the extent possible. Remaining vegetation above the shorelines in the sediment pool areas (471 acres) and in the floodwater detention pool areas (1,020 acres) will be affected by periodic inundation. Construction of the floodwater dikes will alter the land use on three acres of cropland and 16 acres of urban built-up land and urban fringe land. The following table shows the habitat types affected by construction of the floodwater retarding structures and dikes:

HABITAT TYPES AFFECTED BY CONSTRUCTION

Item	Habitat Types Affected							Total (acre)
	Cropland (acre)	Pastureland (acre)	Rangeland (acre)	Open (acre)	Brushy (acre)	Streamside (acre)	Woody (acre)	
Dams & Emergency Spillways	133	0	43	124	18	1	0	319
Sediment Pools Below Lowest Ungated Outlet ^{1/}	96	0	56	130	49	1	0	332
Sediment Pools Above Lowest Ungated Outlet	183	2	68	179	34	5	0	471
Floodwater ^{2/} Detention Pools	529	16	216	225	26	8	0	1,020
Floodwater Dikes	3	0	0	0	0	0	3/16	19

^{1/} 200 acre-foot capacity except floodwater retarding structure No. 2 which will be ported for the purpose of preserving wildlife habitat.

^{2/} Crest of emergency spillway.

^{3/} Miscellaneous land consists of a narrow band adjacent to urban or built-up areas.

Installation of the project will not affect any known rare or endangered species of flora and fauna. Consultation with the Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act of 1973 (Public Law 93-205, as amended) is in progress.

Fish

The aquatic habitat in the watershed is limited. Of the 344 farm ponds in the watershed, about 10 percent are stocked with game fish. Most ponds are not intensively managed for high quality fisheries because their primary purpose is to provide livestock water. High evaporation rates (82 inches annually) and extreme fluctuations in the water levels cause the emergent vegetation to be sparse. The most common emergent species occurring in the littoral zone are cattail, rushes, willows, california bulrush, and beakrush. The impoundments receiving the heaviest use (fisheries harvest, aeration, waterfowl use, etc.) usually support various submerged shallow-rooted aquatics such as muskgrass, water milfoil, and hornworts and may exhibit surface plant growth such as pondweeds.

These vegetative trends are also evident in the lakes that occur within the watershed, of which there are four: Elm Creek Lake, Old Lake Winters, Lake Winters, and Lake Graham. Besides providing wildlife habitat, these lakes serve as limited recreational outlets to the residents of the watershed and are all open free to the public, except for Lake Graham, which has a \$1 per day user fee.

The streams are shallow, turbid, and slow running in areas fed by gravity flow-type seep springs in the headwaters region of the watershed. The major streams with intermittent flow are the lower reaches of Elm Creek and Bluff Creek. Flow is dependent on a perched water table and ground waters in addition to surface runoff. During the summer, flow is interrupted at several points by submerged flow and the streams are reduced to a series of pools. During this low flow period the fishery habitat value of the streams is lessened. Bluff Creek has an estimated standing crop of fish of 15 pounds/acre, while the lower reaches of Elm Creek have an estimated 200 pounds/acre. The major species are minnows, such as red shiner, blacktail shiner, plains minnow, golden shiner, and sunfish.

Impacts. The creation of the 332 acres of open water associated with the floodwater retarding structures in the watershed will improve the fisheries resource. Brush cleared from the construction sites and anchored in the sediment pool areas will provide fish cover and breeding areas. Fenced areas in the sediment pools, and around the shorelines, of floodwater retarding structures Nos. 1, 2, 6, and 7 will improve the quality of water in the pool areas. Reductions in erosion and sediment result in additional improvement in quality of fishery resources.

Surface Water Quality

The U.S. Geological Survey in cooperation with the State of Texas maintains a daily chemical-quality station in conjunction with a streamflow discharge station on Elm Creek near Ballinger. Published records for the period from

1967 through 1977 show that specific conductance ranged from 4,220 micromhos to 306 micromhos, and water temperatures ranged from 34.5° C to 0.5° C. Salt content was highest during periods of low streamflow. Recorded high and low values for various parameters published for the 1977 water year are as follows:

<u>Parameter</u>	<u>Low</u>	<u>High</u>
Specific Conductance (Mhos)	539	2,840
Temperature (Deg. C)	3.5	34.0
pH	7.7	8.4
Dissolved Ca & Mg (mg/l)	81	250
Dissolved Na (mg/l)	32	320
Dissolved SO ₄ (mg/l)	37	360
Dissolved Cl ⁻ (mg/l)	66	610
Dissolved Solids (mg/l)	287	1,660
Sodium Absorption Ratio	1.0	5.1

Sediment load is estimated to average 2,635 milligrams per liter in the estimated 28,700 acre-feet of average annual runoff at the mouth of the watershed.

As an indicator of surface water quality, fish collected from Elm Creek were analyzed by the Texas Department of Agriculture in December 1977. The analysis indicated a very low level of pesticide residues.

Impacts. The project will have insignificant impacts on water quality except for the reduction in pollution associated with a reduction of sediment load in surface waters. Construction activities associated with installation of the project will result in a short-term increase in turbidity of streamflows. When completed, the floodwater retarding structures will have an immediate reducing effect on sedimentation by trapping the sediment. Reduced erosion and sedimentation resulting from the project will produce long-term reductions in the quantity of sediment carried in runoff water.

Ground Water

The Choze Formation of the Clear Fork Group, Permian age, and Recent alluvium yields fresh to moderately saline water in small to moderate quantities to wells in the watershed.

Impacts. Where sediment and detention pools of the proposed floodwater retarding structures are located so that Recent alluvium is inundated, beneficial recharge is likely. No adverse affects on the ground water supply as a result of the structures is anticipated.

Transportation

The present value of roads and bridges that are subject to floodwater damage from the 100-year flood event is \$3,364,500. There are 33,300 feet of rural and city gravel roads, 900 feet of asphalt roads, and 26 bridges that suffer this type of damage. The average annual floodwater

damage to these improvements is \$241,820. This figure is based on the average cost of repairing improvements damaged to their before-damage condition.

Impacts. Installation of the project will reduce damages to the roads and bridges by lowering the flood stages and decreasing the flow velocity of the remaining floodwater. This decreased damage will also create a savings in material and energy and prolong the useful life of the roads and bridges. Average annual cost for repairing floodwater damages will be reduced from \$241,820 to \$69,920, a 71 percent reduction.

Economy, Employment, and the Minority Population

The economy generated within the watershed is based mainly on agriculture and petroleum products. Agriculture is expected to be of prime importance to the economy for the foreseeable future due to the demand for food and fiber. According to the Texas Employment Commission, Runnels County has a labor force of 4,423 and Taylor County has 36,418. There are 155 persons (4 percent) unemployed in Runnels County and 1,245 persons (3 percent) unemployed in Taylor County.

According to Ballinger city officials, the minority population of the urban flood plain is comprised of 74 Blacks and 94 Spanish Americans.

Impacts. All residents of the urban flood plain will receive flood reduction benefits.

Installation of the project will create an estimated 184 man-years of labor related to construction activities. In addition, 87 permanent jobs will be created because of the projected increase in agricultural production. All federal contracts for construction of the structural measures of the project will be awarded to equal opportunity employers, which will assure equal participation by the minority population in job opportunities.

Air Quality

Air quality within the watershed is excellent and there are no known problems. The metropolitan area of Abilene is about 25 miles north of the watershed and contributes only marginal influence because of the prevailing southerly winds.

Impacts. There will be a slight increase in dust in localized areas of the project due to construction activities. This impact will be of short duration.

Cultural Resources of National Significance

There are 24 significant archeological sites that have been identified in the watershed at or near the proposed floodwater retarding structure sites. The sites are related to cultural activities that date back to the Paleo-Indian period of 10,000 to 6,000 B.C. The study made by Southern Methodist University under contract with the SCS, verifies the limited amount of archeological information available for the upper Colorado

River Basin and the Elm Creek watershed. The archeological team recommended that 9 of the 10 areas surveyed be nominated as a district to the National Register of Historic Places.

Impacts. Twenty-four significant archeological sites will be affected by the project. The archeological team recommended mitigation by salvage of the 24 affected sites.

The significant archeological sites which were identified during the environmental assessment of the watershed will be nominated to the National Register of Historic Places. The estimated cost for salvaging these archeological resources is \$116,580. The National Park Service will be requested to fund salvage which exceeds one percent of Public Law 566 construction cost of each measure that affects archeological resources.

Visual Resources

Three distinctive landscape types comprise the watershed: (1) undulating to steep limestone hills; (2) nearly level to gently undulating outwash plains; and (3) a nearly level flood plain. Horizontal lines broken by low undulating hills dominate the areas which will be affected most by direct project action.

Impacts. The floodwater dikes will be visible from the residential areas and will change the present visual resource from a mixture of open land or brushy, mesquite-covered land to a continuous band of open land. Woody-type plants will be planted in selected areas of the dikes to lessen the impact, improve the resource, and improve the wildlife habitat. When constructed, floodwater retarding structures Nos. 1, 2, 3, 4, 5, and 6 can be seen from gravel county roads that are traveled mainly by local residents. The dam of structure No. 5 will be constructed approximately 300 feet from one occupied farm house. The top of the dam will be about 15 to 20 feet higher than the floor of the house and will obscure the view from the house. To mitigate this adverse impact on the visual resource, a vegetative screen about 300 feet long will be planted and maintained adjacent to the dam. Structure No. 7 can be seen from Ranch Road 53. All of the structures will blend into the natural landscape. The existing landscape architecture priority for all of the structures has been determined to be low except structure No. 5 which is medium.

Visual aspects of the watershed may be enhanced, deteriorated, or unchanged, depending upon the personal observation and feeling of the viewer. However, the presence of a body of impounded water may give the observer an esthetically pleasing feeling. The observances of pleasing sights and sounds serve to promote a tranquil atmosphere and enhance a quality environment.

CONSULTATION

A multi-disciplinary environmental assessment by representatives of the SCS, the Texas Parks and Wildlife Department, and the Fish and Wildlife Service was made in August 1975. In June 1976, the Environmental Protection Agency toured the watershed with SCS representatives to view

areas of interest to them. Planning aid letters were received from the Fish and Wildlife Service in June 1974, May 1976, and August 1977. The recommendations made therein were considered during project planning and were incorporated to the extent that they were feasible and necessary to accomplish the objectives of the project and were implementable under the authority of the Watershed Protection and Flood Prevention Act. Biologists from the Fish and Wildlife Service and Texas Parks and Wildlife Department toured the proposed structure sites again in February 1979 in preparation for their review of our watershed plan and environmental impact statement. The recommendations to reduce impacts of project construction on fish and wildlife resources made by the Fish and Wildlife Service and the Texas Parks and Wildlife Department and a summary of the disposition of each recommendation made during the project are as follows:

1. Preserve, to the maximum extent possible, the wildlife habitat types of highest quality which are the streambank woody assemblages and the brushy rangelands.

Disposition: Structures were located to avoid woody vegetation to the maximum extent practical. However, the flat terrain offers few situations where structures can be built. The 200 acre-foot pool of structure No. 2 would inundate 18 acres of streamside woody habitat, so a port is planned to reduce the water surface area, resulting in the inundation of only 11 acres of hardwoods. The other structures were not conducive to such mitigatory action.

2. Especially avoid areas of trees along the watercourses where turkeys are roosting.

Disposition: During habitat evaluation, several areas where turkeys had roosted were observed (floodwater retarding structures Nos. 1, 2, and 7, Appendix F). The planned dams, spillways, and permanent water areas were sited and designed to avoid these areas.

3. Study and quantify the altered flow of Elm Creek and its tributaries due to installation of the floodwater retarding structures.

Disposition: A study of the quantity and altered flow of streams in the watershed as a result of project action is part of the environmental impact study and is discussed in the "Environmental Consequences" section under "Streams and Lakes."

4. Include fish and wildlife concerns in land treatment measures.

Disposition: The accelerated technical assistance for improvement of wildlife habitat will assure that consideration is given to wildlife concerns. SCS personnel will continue to stress this resource as they work with landusers in planning conservation measures.

5. All revegetative efforts should include plant species that are beneficial to wildlife.

Disposition: The dams, spillways, and other disturbed areas not subject to inundation will be seeded to a mixture of native grasses

and will be protected from excessive grazing. In addition, species of forbs and woody plants that have use for wildlife will be planted in odd areas around dams and emergency spillways.

6. Compensate for remaining wildlife losses by acquiring land and managing it for wildlife.

Disposition: The SCS and the sponsors believe that there will be no significant losses following construction and vegetation of the floodwater retarding structures. Planning experience and observations in nearby watersheds (Middle Colorado project and Valley Creek watershed) affirm that the floodwater retarding structures provide high quality terrestrial habitat on the fenced dams and spillways which is utilized by turkeys, quail, rabbits, furbearers, and other species. The sediment pools are also valuable habitat elements for many species such as deer, turkey, furbearers, wading birds, and fish. The following features will minimize adverse impacts to wildlife. These features have been incorporated into the plan.

- a. Locating structures to avoid high value streamside woody habitat and brushy native grassland to the maximum extent practical.
- b. Porting floodwater retarding structure No. 2 below the 200 acre-foot elevation to reduce the amount of woody vegetation that is inundated.
- c. Fencing dams, spillways, and portions of the shorelines of floodwater retarding structures Nos. 1, 2, 6, and 7, which will protect the vegetation from excessive grazing by domestic livestock.
- d. Restricting borrow to the lowest ungated outlet elevation where possible.

The sponsors opted to include the above features rather than try to obtain land that they would have to operate and manage for use by wildlife.

7. Allow public access to floodwater retarding structures.

Disposition: The legal authority of local watershed sponsors is limited to acquisition of the land rights necessary to achieve the function or purpose of the plan. In the case of single-purpose flood prevention structures, only the necessary land rights for that purpose may be obtained. No purpose is included in the plan that requires public access to the structures.

8. Leave timber standing in sediment pools.

Disposition: All vegetation above the lowest ungated outlet elevations of the seven structures will remain intact. On floodwater retarding structures Nos. 2, 3, 4, 5, 6, and 7, woody vegetation that is more than 400 feet from the principal spillway will remain

undisturbed. When this woody vegetation is inundated, it will provide needed cover for fish, improve habitat for waterfowl, and locally influence wind velocities.

9. Fence all detention pools.

Disposition: Fencing a buffer zone around the shorelines of the structures is a good wildlife management practice, but to include the entire detention pool areas would impose a significant hardship on the sponsors, who are responsible for land rights. The plan includes fencing of the shorelines on the properties where livestock utilization is anticipated.

10. Restrict borrow sites to sediment pools.

Disposition: The borrow areas will be restricted, to the extent possible, to the lowest ungated outlet elevations, which are below the sediment pool elevations. Should additional material be needed, a site selection will be based on an interdisciplinary assessment of the impacts.

11. Protect streams from physical alteration and from "degradation of normal stream flow."

Disposition: The construction of the dam and sediment pool areas will convert 6.5 miles of intermittent streams to impoundment areas. The project will cause an initial reduction of 0.9 percent in average annual streamflow from the watershed.

12. Reduce the siltation caused by erosion to improve aquatic habitat.

Disposition: The land treatment program will reduce erosion. The seven floodwater retarding structures will trap sediment and prevent it from entering lakes and waterways in the watershed and the Colorado River. The floodwater retarding structures will reduce flood plain erosion and sedimentation.

13. Locate and correct surface and ground water problem of oil field - brine seepage.

Disposition: This problem is outside the scope of Public Law 566 and was not included as an objective of the Elm Creek watershed project by the sponsors.

Summary of Actions to Mitigate Adverse Impacts

The following is a summary of specific actions taken during the planning process to mitigate the adverse impacts of the project:

1. Careful placement of the floodwater retarding structures to assure unnecessary involvement of high value hardwoods, turkey roosts, and other areas of special use by wildlife.

2. Installation of a low port in the principal spillway of floodwater retarding structure No. 2 to reduce the size of the sediment pool area in order to save high value hardwoods.
3. Leaving woody vegetation undisturbed in upper reaches (more than 400 feet from principal spillway) of pool area (lowest ungated outlet elevation) of floodwater retarding structures Nos. 2, 3, 5, 6, and 7.
4. Restricting borrow, to the extent possible, to those areas that are at or below the elevation of the lowest ungated outlets on all structures. Should additional material be needed, a site selection will be based on an interdisciplinary assessment of the impacts.
5. Building fence to protect the shorelines from grazing by domestic livestock on floodwater retarding structures Nos. 1, 2, 6, and 7.
6. Planting the dams and emergency spillways with a mixture of native grasses. Also, multi-use plants such as mulberry, crabapple, indigobush, russianolive, plum, desert willow, maximilian sunflower, engelmann daisy, or vetch will be planted in odd areas around the spillway plunge basin or shoreline. The plantings will be protected with fences.

DISCUSSION AND DISPOSITION OF EACH COMMENT ON DRAFT
ENVIRONMENTAL IMPACT STATEMENT AND PLAN

Comments were requested from the following federal, state, and local agencies and organizations:

Federal

Department of Agriculture
 Department of the Army
 Department of Commerce
 Department of Health, Education, and Welfare
 Department of the Interior
 Department of Transportation
 Environmental Protection Agency
 Federal Power Commission
 Office of Equal Opportunity, USDA
 U.S. Coast Guard

State and Other

Budget and Planning Office (State agency designated by Governor and State clearinghouse)
 West Central Texas Council of Governments (Regional clearinghouse)
 Environmental Defense Fund
 Friends of the Earth
 Lower Colorado River Authority
 National Audubon Society
 National Resources Defense Council
 National Wildlife Federation
 Texas Committee on Natural Resources
 Wildlife Management Institute

The following agencies and organizations submitted comments on the draft Plan and Environmental Impact Statement:

Federal

Department of Agriculture
 Forest Service
 Office of Equal Opportunity
Department of the Army
Department of Commerce
 National Oceanic and Atmospheric Administration
Environmental Protection Agency
Federal Energy Regulatory Commission
Department of Health and Human Resources
Department of Housing and Urban Development
Department of the Interior

State and Other

Office of the Governor, Budget and Planning Office
Texas Agricultural Extension Service
Bureau of Economic Geology
Texas Forest Service
Texas Department of Health
State Department of Highways and Public Transportation
General Land Office
Texas Parks and Wildlife Department
Railroad Commission of Texas
Governor's Office of Regional Development
Texas State Soil and Water Conservation Board
Texas Department of Water Resources

The responding agencies' comments and the disposition of each are as follows:

Department of Agriculture, Forest Service

Comment: The Service stated that the photo on page 13 would appear to be an indictment of another Federal program, in that the houses would appear to have been built subsequent to the executive order prohibiting the expenditure of Federal funds for construction of damageable properties in a flood-prone area.

Response: The photo is not intended as an indictment of another federal program. The purpose is to portray a problem that exists in the watershed.

Comment: The Service stated that they did not find any mention of possible problems with accumulated water within the dikes or measures to prevent or minimize problems of this kind.

Response: Wording has been added on page 33 to show that pipe outlets through the dikes will provide internal drainage to prevent accumulated water from damaging the protected area.

Comment: The Service stated that the Heritage Conservation and Recreation Service (HCRS) has been abolished and that references other than those in the past tense should use the agency title now responsible for this particular function.

Response: The HCRS was abolished as of May 31, 1981 and subsequent to this draft EIS. Reference to the agency responsible for this archeological function has been changed to the National Park Service.

Comment: The Service stated that the reference to the Paleo-Indian time period should be changed from Paleo-Indian state to Paleo-Indian period or era.

Response: The wording has been changed to Paleo-Indian period as suggested.

Comment: The Service stated that it is difficult to determine what is called for on the "List of Preparers and Qualifications" section and that the column EXPERIENCE should account for most if not all of the individuals total experience.

Response: The column has been changed to PREVIOUS EXPERIENCE. Time noted in this column plus time in the PRESENT TITLE will account for the individual's relevant experience.

Department of Agriculture, Office of Equal Opportunity

Comment: The Office stated that they appreciate the EIS including an assessment of the impacts upon minority populations in the area.

Response: Noted.

Department of the Army

Comment: The Department stated that the U.S. Army Corps of Engineers regulates the discharge of dredged and fill material into waters of the United States, including adjacent wetlands, under Section 404 of the Clean Water Act and that the proposed work will occur upstream of the headwaters of Elm Creek and therefore may be authorized by a nationwide permit, requiring no administrative action, provided the following conditions are met:

- (1) That the discharge will not destroy threatened or endangered species as identified under Endangered Species Act, or endanger the critical habitat of such species;
- (2) That the discharge will consist of suitable material free from toxic pollutants in other than trace quantities;

- (3) That the fill created by the discharge will be properly maintained to prevent erosion and other non-point sources of pollution; and
- (4) That the discharge will not occur in a component of the National Wild and Scenic Rivers System or in a component of a State wild and scenic river system.

Response: Noted.

Comment: The Department stated that the proposed project will not interfere with any existing or proposed Corps of Engineers' projects in the Colorado River Basin.

Response: Noted.

Department of Commerce, National Oceanic and Atmospheric Administration

Comment: The Administration stated that the National Ocean Survey's geodetic control survey monuments may be located in the proposed project area and if the project will disturb any of these monuments the Administration should have not less than 90 days notification before the monuments are disturbed or destroyed. In addition, this project should include funding for the cost of any relocation required.

Response: No geodetic control survey monuments have been identified in the planned disturbance areas of this project. The SCS has coordinated with the NOS to verify this determination.

Environmental Protection Agency

Comment: The Agency made the following request:

"Please take all feasible precautions to limit impacts upon water quality, air quality and wildlife habitat. Mitigation measures should be used to control erosion and to protect archeological sites."

Response: Noted.

Comment: The Agency classified the Draft EIS as LO-i and stated that they have no objections to the project as it relates to the EPA's legislative mandates.

Response: Noted.

Comment: The Agency stated that the EIS contained sufficient information to evaluate adequately the possible environmental impacts which could result from project implementation.

Response: Noted.

Federal Energy Regulatory Commission

Comment: The Commission stated that the proposed watershed project would not provide opportunity for the economical development of hydroelectric power and would not have any significant effect on existing or potential hydroelectric power developments.

Response: Noted.

Comment: The Commission stated that the project would not have any significant effect on existing or potential hydroelectric power developments.

Response: Noted.

Comment: The Commission noted that the Lone Star Gas Company operates natural gas pipelines in the proposed project area but that apparently the project would not conflict with the continued operation of any pipelines.

Response: The planned project will not affect any existing pipelines.

Comment: The Commission stated that apparently the proposed project would not have any significant effect on the production of hydrocarbon resources from the area.

Response: Noted.

Department of Health and Human Resources (Public Health Service)

Comment: The Service stated that no mention is made of either beneficial or adverse impacts of this project on mosquito or other vector populations.

Response: Statements of pages 33 and 34 point out that efforts will be made to avoid creating conditions which will increase populations of vectors which affect public health conditions and that control measures will be implemented, if needed, in cooperation with appropriate federal, state, and local health agencies to suppress proliferation of vectors that could occur during installation of the structures. A problem with vector population is not anticipated.

Comment: The Service noted that the EIS did contain a statement on herbicides and insecticides.

Response: Noted.

Department of Housing and Urban Development

Comment: The Department noted that there is no mention whatsoever of compliance with the requirements of the Floodplain Management Executive Order (E.O. 11988) in connection with the proposed undertaking.

Response: SCS project planning is accomplished in accordance with published rules that outline policy and general guidelines for implementation of laws and executive orders. The rule published in 7CFR, Part 650.25 describes how environmental evaluation in project programs integrates floodplain management considerations of the order into SCS's National Environmental Policy Act (NEPA) process. Specific reference of compliance with each Order or Act is not necessary in the plan. General reference to compliance with the NEPA process is contained in the executive summary of the plan and EIS.

Comment: The Department stated that in their opinion, the statement contains only the most casual and superficial discussion of the pros and cons of alternatives to the proposed action.

Response: Development of alternatives is discussed in the "Project Formulation" and "Alternatives" sections on pages 18 through 27.

Comment: The Department stated that in view of the recent Austin flood disaster they would not want to be placed in the position of opposing any project that has a significant potential for reducing future risks of loss of human life but that they would be remiss if they did not point out that the project appears unimpressive in terms of overall benefits versus cost and that the ratio of private property savings to tax expenditures is approximately 1 to 1.

Response: This project meets the requirements of Public Law 566 that the national economic benefits exceed costs of the project. There are also benefits of the project not measured in monetary terms such as eliminating the risk of loss of life from the 100-year flood event in the Elm Creek floodplain.

Department of the Interior

Comment: The Department stated that the final statement should show the location of the two pipelines; an 8-inch Scurlock crude oil pipeline trending NNE from the western edge of the watershed north of Ballinger and a 10-inch Gulf petroleum products pipeline in the northern part of the watershed running NNE to Abilene. The Department also stated that potential impacts should be discussed.

Response: The locations of these two pipelines plus other pipelines are noted on maps included in the SCS supporting data files but are not included in the EIS because they will not be affected by project action.

Comment: The Department stated that although the SCS has made an effort to identify cultural resources in the project area; (1) mitigation measures have not been adequately addressed; (2) they have not received a request for funding and have not allocated funds to assist the project data recovery program; (3) data recovery estimates from 1978 should be updated and a viable mitigation plan should be developed in the final statement; (4) documentation of consultation with the State Historic Preservation Officer and the Advisory Council on

Historic Preservation should be included; and (5) determination of eligibility should be requested from the Keeper of the National Register of Historic Places.

Response: Page 34 of the plan has been modified to clarify procedures for carrying through with the funding and mitigation of archeological sites. As to consultation with the State Historic Preservation Officer and Advisory Council, page 34 describes that effort and their concurrences. Determination of eligibility has been requested from the Keeper of the National Register. Documentation of this action is included in the supporting data files of the SCS.

Comment: The Department stated:

"We are pleased with the proposal to provide for fish and wildlife resources in the project area. The majority of our recommendations have been included in the watershed plan. Additionally, the SCS will provide two and one-half man-years toward the improvement of 80,000 acres of upland wildlife habitat. This measure should provide substantial natural resource benefits in the watershed for which the SCS is to be commended.

We urge the SCS to closely monitor this project in identifying its benefits to wildlife in order that this measure can be justified on other small watershed projects as well."

Response: Noted.

Comment: The Department stated that in discussing factors causing poor groundwater quality (page 17), the final statement should identify the aquifer(s) involved in the project area, indicate the significance of groundwater as a source of supply in the area, and should assess the potential for either beneficial or adverse effects of the flood-water retarding structures on groundwater levels and quality.

Response: The groundwater section on page 17 and the impact sections, page 52, have been modified to identify the major aquifers in the watershed and describe the impacts of the project.

Office of the Governor, Budget and Planning Office

Comment: The Office stated that the draft had been reviewed by them and other interested agencies and were forwarding copies of the review comments.

Response: Noted. The responding State agencies' comments and the disposition of each are as follows.

Texas Agricultural Extension Service

Comment: The Service stated that they find the plan and statement in proper order and have no suggestions to offer for substantive changes.

Response: Noted.

Comment: The Service stated that they fully support projects of this type because they recognize the value of these efforts to the people and resources of those areas.

Response: Noted.

Bureau of Economic Geology

Comment: The Bureau had no comment.

Response: Noted.

Texas Forest Service

Comment: The Service stated that they consider the project plan well written and concur in its implementation.

Response: Noted.

Comment: The Service stated that they offer the use of forest tree seedlings from their Indian Mound and West Texas nurseries supportive of wild-life habitat enhancement.

Response: Noted.

Comment: The Service pointed out that the terminology "Prime Farmlands" had been replaced with the wording "Prime Farmland Soils" and that the former was used throughout the text.

Response: The wording has been changed to "Prime Farmland Soils" throughout the text.

Texas Department of Health

Comment: The Department stated that based on the information contained in the subject document, no adverse public or environmental health conditions are expected to arise from the proposed actions.

Response: Noted.

State Department of Highways and Public Transportation

Comment: The Department stated that they do not anticipate any adverse effects to existing or proposed highways on the State Highway system as the result of the proposed system of floodwater dikes and floodwater retarding structures.

Response: Noted.

General Land Office

Comment: The Office stated that there are no Public Free School Tracts located within the watershed.

Response: Noted.

Texas Parks and Wildlife Department

Comment: The Department had the following comments:

"In consideration of the overall project and the planning efforts that pertain to wildlife resources, the Soil Conservation Service (SCS) should be complimented. Specific measures such as seeding disturbed areas with a mixture of native grasses, fencing areas of the sediment pools, and leaving valuable woody vegetation undisturbed would be beneficial to wildlife.

This agency is particularly pleased that a wildlife biologist will be employed on a one-half time basis to provide assistance to landowners in the watershed. To assist in this effort, I would like to volunteer my staff to work with the SCS biologist in the development of wildlife management plans that could be implemented by landowners."

Response: Noted.

Railroad Commission of Texas (Oil and Gas Division)

Comment: The Commission had no comment.

Response: Noted.

Governors' Office of Regional Development

Comment: The Office had no comment.

Response: Noted.

Texas State Soil and Water Conservation Board

Comment: The Board made the following comment:

"This agency received the application for assistance on this project on April 5, 1967. Since that time we have worked with the sponsors on numerous occasions attempting to ensure that their objectives would receive federal assistance. The State Soil and Water Conservation Board granted a planning priority on this project on March 22, 1973.

Our involvement with the sponsors and the Soil Conservation Service staff working on the project leads us to believe that the objectives of the sponsors will be satisfied by this work plan and that the project measures called for in the work plan are the best practicable solution to the watershed problems. We urge that all associated with the project from this point forward seek expedient implementations of the plan."

Response: Noted.

Texas Department of Water Resources

Comment: The Department made the following statements:

1. "The staff concurs in principle with the proposed joint decision and agreement to be made by the USDA-SCS and the local project sponsors to: (a) encourage landowners and operators to maintain land treatment practices; (b) obtain agreements from land users of not less than 50 percent of the land upstream of each reservoir and floodwater-retarding structure will be adequately protected from soil erosion before the construction of the said structures (p. 38); (c) construct the City of Ballinger flood protection dikes after the construction of the seven floodwater-retarding structures (pp. 37 and 39).

This sequence of project accomplishments is deemed essential in order to ensure reasonable control of soil erosion and reduction in the expected high rates of reservoir siltation; a prolongation in the effective life of the reservoirs; and, a reduction in reservoir maintenance costs..."

2. The TDWR staff concurs in principle with the total watershed development concept reflected in the report. The proposed plan appears to be reasonably consistent with the USDA-SCS's manual: Erosion and Sediment Control Guidelines for Developing Areas in Texas (1976), and with TDWR's report, LP-66: Flood Hazard Evaluation Guidelines for Texas State Agencies (1978). The plan appears to properly incorporate elements based on sound reclamation practice and policy that successful operation of dams and reservoirs requires:
 - a. The watershed areas upstream of the reservoirs be managed in a mutually compatible manner;
 - b. the released regulated waters will enable downstream lands to be developed and used to better advantage; and,
 - c. the project operations will result in attaining and maintaining both the potential productivity and the present production, in consonance with the hydrologic functions of the land--with the multiobjectives of producing food, forage, wood, wildlife, minerals, recreations, and water now and in the future.

Response: Noted.

LIST OF PREPARERS AND QUALIFICATIONS

NAME	PRESENT TITLE (Time in Job-Yrs.)	EDUCATION		PREVIOUS EXPERIENCE (Titles & Time) in Job-Yrs.)	OTHER (License, etc.)
		Degree(s)	Continuing Edu. Subjects		
Beade O. Northcut	Staff Leader - 7	BS - Agr. Engr.	Public Administration	Planning Engr. - 4 Area Engr. - 5 Proj. Constr. Engr. - 3 Agr. Engr. - 3	P.E. Registration Registered Public Surveyor
Joe N. Brandon	Agr. Economist - 5	BS - Agr. Econ.	Computer Science	Soil Conservst. - 1	
Glen B. Miller	Geologist - 3	BS - Geology MS - Soil Science	Sedimentation Soil Mechanics	Soil Scientist - 1 Core Drill Geologist - 2	Certified Prof. Soil Scientist
Susan C. de Milliano	Biologist - 4	BS - Wildlife & Fisheries Sciences		Soil Conservst. - 1	Certified - Assoc. Wildlife Biol.
David C. Dybala	Hydraulic Engr. - 6	BS - Agr. Engr.	Stable Earth Channels Course Statistical Methods in Hydrology Flood Plain Hydrology Hydrometeorology Hydrologic Modeling	Agr. Engr. - 4	P.E. Registration
J. David Kelley	Soil Conservst. - 6	BS - Agron.	Soil Correlation Environmental Planning Landscape Architecture Environmental Assessment Public Involvement Information Techniques	Soil Scientist - 17	Certified - Prof. Agronomist Certified - Prof. Soil Scientist

TABLE 1 - ESTIMATED INSTALLATION COST
Elm Creek (1250) Watershed, Texas

Installation Cost Item	Unit	Number	P.L. 566 Funds		Estimated Cost (Dollars) ^{1/}				Total
			Non-Federal Land	Non-Federal Land SCS ^{2/}	Non-Federal Land	Non-Federal Land SCS ^{2/}	Other Funds	Other	
LAND TREATMENT - ACCELERATED Wildlife Or Land Habitat Management	Ac.	80,000	0	0	80,000	0	0	80,000	80,000
Technical Assistance		xxx	102,700	0	0	0	0	102,700	102,700
Project Administration		xxx	40,800	0	0	0	0	40,800	40,800
TOTAL LAND TREATMENT		xxx	143,000	80,000	80,000	0	0	80,000	223,000
STRUCTURAL MEASURES									
Floodwater Retarding Structures ^{3/}	No.	7	4,647,950	519,250	81,490	600,740	5,248,690	5,248,690	5,248,690
Floodwater Dikes ^{4/}	No.	2	36,140	18,700	0	18,700	101,860	101,860	101,860
TOTAL STRUCTURAL MEASURES		xxx	4,734,090	537,950	81,490	619,440	5,353,530	5,353,530	5,353,530
TOTAL PROJECT		xxx	4,877,090	617,950	81,490	699,440	5,576,530	5,576,530	5,576,530

1/ Price Base: 1980

2/ Federal agency responsible for assisting in installation of works of improvement.

3/ Includes \$19,130 cost of fencing shorelines for wildlife habitat mitigation and project administration (floodwater retarding structures).

4/ Includes \$5,000 cost of landscape plantings for visual resource mitigation and project administration (floodwater dikes).

July 1981

TABLE 2 - ESTIMATED COST DISTRIBUTION
STRUCTURAL MEASURES

Elm Creek (1250) Watershed, Texas
(Dollars) ^{1/}

Item	Installation Cost - Public Law 566 Funds				Installation Cost - Other Funds				Total Installation Cost
	Construction	Engineering	Cultural Resource Salvage	Project Admini- stration	Total Public Law 566	Land Rights	Heritage Conservation and Recreation	Service Cultural Resource Salvage	
STRUCTURAL MEASURES									
Floodwater Retarding Structures Nos.									
1	509,330	41,770	5,090	69,630	625,920	2/ 16,800	33,650	500	70,950
2	916,610	66,000	9,170	125,300	1,117,080	3/ 96,500	21,660	500	118,460
3	747,470	56,810	7,470	102,180	913,930	99,600	9,600	500	109,700
4	283,570	26,940	0	38,760	349,270	4/ 41,500	0	500	42,000
5	390,270	32,000	3,900	53,350	479,520	5/ 79,500	7,270	500	87,270
6	249,110	24,910	2,490	36,060	310,570	5/ 62,200	1,240	500	63,940
7	696,620	57,940	6,970	95,230	851,760	5/ 99,650	8,270	500	108,420
Floodwater Dikes Nos.									
101	9,640	960	-	1,320	11,920	2,100	-	500	2,600
102	60,020	6,000	-	8,200	74,220	15,600	-	500	16,100
GRAND TOTAL	3,862,640	308,330	35,090	528,030	4,736,090	533,450	81,490	4,500	619,460

1/ Price Base: 1980
 2/ Includes \$850 for elevating two oil wells and \$50 for obtaining a permit for one powerline.
 3/ Includes \$50 for obtaining a permit for one telephone cable and \$50 for obtaining a permit for one powerline.
 4/ Includes \$5,000 for modifications of powerlines.
 5/ Includes \$2,500 for modifications of 10 powerline poles and \$1,000 for modifications to 2 barns and an abandoned house.

TABLE 3A - STRUCTURAL DATA
DIKE SYSTEM

Elm Creek (1250) Watershed, Texas

Dike No.	Segment No. ^{1/}	Drainage Area (ac.)	Length of Dike (ft)	Top of Dike Feet (msl)	Outlets ^{3/} (No.-in.dia.)	Embankment Volume (cu. yd.)
101	1	20	618	1628.3	1 - 36 1 - 12	4,510
102	1	19	410	1628.3 1627.0	1 - 36	3,670
	2	19	550	to 1626.6	1 - 36	2,290
	3	46	2,504	to 1624.4	1 - 36	19,570
	4	50	1,346	to 1623.0	1 - 36	3,280
	5	50	1,140	1623.0	1 - 36	3,250
TOTAL		204	6,568			36,570

^{1/} Segments numbered upstream to downstream.

^{2/} Top of dike is the maximum 100-year frequency flood stage for with project conditions plus 2.0 ft. freeboard.

^{3/} Outlets are corrugated metal pipes with flapgates controlling flow direction.

July 1981

TABLE 4 - ANNUAL COST

STRUCTURAL MEASURES

Elm Creek (1250) Watershed, Texas
(Dollars)^{1/}

Evaluation Unit	: Amortization : of : Installation : Cost ^{2/3/}	: Operation, : Maintenance, : and : Replacement : Cost	Total
Structural Measures	440,070	5,070	445,140

^{1/} Price base: 1980

^{2/} Amortized at 7-3/8 percent interest rate for 100 years; includes compound interest during installation period.

July 1981

TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS
 Elm Creek (1250) Watershed, Texas
 (Dollars)^{1/}

Item	Estimated Average Annual Damage		Damage Reduction Benefit
	Without Project	With Project	
Floodwater			
Crop and Pasture	173,050	61,370	111,680
Other Agricultural	72,440	33,820	38,620
Nonagricultural			
Road and Bridge ^{2/}	241,820	69,920	171,900
Urban	14,120	0	14,120
Subtotal	501,430	165,110	336,320
Sediment			
Overbank Deposition	40,130	22,240	17,890
Erosion			
Flood Plain Scour	87,380	38,730	48,650
Streambank	11,670	5,140	6,530
Subtotal	99,050	43,870	55,180
TOTAL	640,610	231,220	409,390

^{1/} Price base: Current normalized price (June 1980) for agricultural damages and current (1980) prices for nonagricultural damages.

^{2/} Includes damages to city streets.

July 1981

TABLE 6 - COMPARISON OF BENEFITS AND COSTS
STRUCTURAL MEASURES

Elm Creek (1250) Watershed, Texas
(Dollars)^{1/}

Evaluation Unit	Damage Reduction	More Intensive Land Use	Benefit Accrued- Installation Period	Total	Average Annual Cost	Benefit-Cost Ratio
Structural Measures	409,390	124,730	33,040	567,160	445,140	1.3:1.0

445,140

1/ Price base: Current normalized prices (June 1980) for agricultural damages and current (1980) prices for nonagricultural damages.
 2/ Includes benefits and interest at 7-3/8 percent accrued during the installation period.
 3/ From Table 4.

INDEX

	<u>Page</u>
Aquatic Habitat.	2, 9-18, 19, 20, 21, 22, 42, 50, 51, 52-57
Archeological Resources.	5, 18, 22, 27, 34, 40, 50, 54
Architecture Priorities	54
Borrow Areas	31, 32, 48, 56, 58
Climate.	2
Dikes.	24, 25, 33, 37, 40
Economy.	3, 18, 27, 40, 41, 43, 44, 53
Erosion.	6-7, 21, 22, 27, 33, 40, 42, 44, 45, 51, 52, 57
Fish and Wildlife Problems	2, 9, 17
Floodwater Problems.	7-9
Acres	9, 42
Indirect.	21
Roads and Bridges	8, 17, 18, 21, 52
Urban	7-9, 17, 18, 21, 22, 27, 42
Floodwater Retarding Structures.	18-24, 28-34, 37, 40, 45, 48, 51, 52, 53, 54-57
Geology.	4, 31
Goals.	17, 18
EQ.	18, 21, 22, 23
NED	17, 21, 22, 23
Land Resource Areas.	2, 28
Land Treatment	6, 7, 17, 18, 21 22, 24, 25, 35, 36, 43-46, 51, 53, 54-57
Land Use	3, 4, 42, 45, 46

INDEX - Cont'd

	<u>Page</u>
Mineral Resources	5, 42
Minorities	3, 42, 52
Mitigation	33, 34, 42, 58
Population	3, 42, 52
Prime Farmland	3, 27, 42, 45, 46
Recreational Resources	5, 18, 21, 51-52
Sediment	6, 17, 18, 21, 22, 31 33, 42, 45, 51-52, 57
Soils	2, 7-9, 22, 44, 45
Surface Water Resources	2, 17, 18, 22, 42, 47, 51, 52
Visual Resources	5, 18, 42, 53, 54
Wildlife Habitat	4, 9-18, 19, 21, 22, 25, 27, 29, 36, 40, 47, 48-52, 57

Display Accounts for Recommended Alternative

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of effects</u> (Average Annual) <u>1/ 2/</u>	<u>Components</u>	<u>Measures of effects</u> (Average Annual) <u>1/ 2/</u>
Beneficial effects:			
A. The value to users of increased outputs of goods and services		Adverse effects:	
1. Damage reduction	442,430 ^{3/}	A. The value of resources required for a plan	
2. Intensification	124,730	1. 7 floodwater retarding structures + dike	
		a. Project installation	440,070
		b. Operation, maintenance and replacement	5,070
Total beneficial effects	567,160	Total adverse effects	445,140
Net beneficial effects	122,020		

1/ 100-years at 7.375 percent interest.

2/ Price base: June 1980 current normalized prices for agricultural, 1980 prices for all other.

3/ Includes interest and benefits accrued during installation period.

REGIONAL DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of effects</u> Region <u>1/</u> : Nation (Average Annual) <u>2/3/</u>	<u>Components</u>	<u>Measures of effects</u> Region <u>1/</u> : Nation (Average Annual) <u>2/3/</u>
A. Income:		A. Income:	
Beneficial effects:		Adverse effects:	
1. The value of increased output of goods and services to users residing in the region		1. The value of resources contributed from within the region to achieve the outputs	
a. Damage reduction	442,430 ^{4/}	a. 7 floodwater retarding structures and associated dikes	97,240 342,830
b. Intensification	124,730 0	b. Project installation operation, maintenance, and replacement	5,070 0
Total beneficial effects	567,160 0	Total adverse effects	102,310 342,830
		Net beneficial effects	464,850 -342,830

1/ Low Rolling Plains Region of Texas, as designated in the Texas Interindustry Project, Office of the Governor, Division of Planning Coordination.
2/ 100-years at 7.375 percent interest
3/ Price base: June 1980 current normalized prices for agricultural, 1981 prices for all other.
4/ Includes benefits and interest accrued during installation period.

ENVIRONMENTAL QUALITY ACCOUNT

<u>Components</u>	<u>Measures of effects</u>										
Beneficial and adverse effects:											
A. Areas of natural beauty	<ol style="list-style-type: none"> 1. Present and/or expected future land will be altered as follows: <table border="0" style="margin-left: 40px;"> <tr> <td style="padding-right: 20px;">Cropland</td> <td style="text-align: right;">-415 acres</td> </tr> <tr> <td>Pastureland</td> <td style="text-align: right;">+50 acres</td> </tr> <tr> <td>Rangeland</td> <td style="text-align: right;">-327 acres</td> </tr> <tr> <td>Other (except water)</td> <td style="text-align: right;">+322 acres</td> </tr> <tr> <td>Water</td> <td style="text-align: right;">+370 acres</td> </tr> </table> 2. Visual quality will be modified by floodwater retarding structures, dikes, and use thereof. 3. Landscape plantings will be made on selected areas of dikes and on the floodwater retarding structure which is highly visible from an occupied residence. 	Cropland	-415 acres	Pastureland	+50 acres	Rangeland	-327 acres	Other (except water)	+322 acres	Water	+370 acres
Cropland	-415 acres										
Pastureland	+50 acres										
Rangeland	-327 acres										
Other (except water)	+322 acres										
Water	+370 acres										
B. Quality consideration of water, land, and air resources	<ol style="list-style-type: none"> 1. Place structural measures carefully. 2. Install low port on floodwater retarding structure No. 2 to avoid inudating hardwood trees. 3. Leave woody vegetation undisturbed in selected areas. 4. Restrict borrow areas to limit adverse effects on woody habitat. 5. Protect shoreline of selected floodwater retarding structures by fencing. 6. Revegetate disturbed areas with selected plants. 7. Create a net increase of 1,050 acres of prime farmland. 										
C. Biological resources	<ol style="list-style-type: none"> 1. Encourage landusers to create and manage upland wildlife habitat on 80,000 acres. 2. Destroy or alter about 650 acres of wildlife habitat. 3. Reduce surface water pollution associated with sediment load. 4. Create 332 acres of open water. 										

ENVIRONMENTAL QUALITY ACCOUNT (continued-2)

ComponentsMeasures of effects

Beneficial and adverse effects:

D. Cultural resources

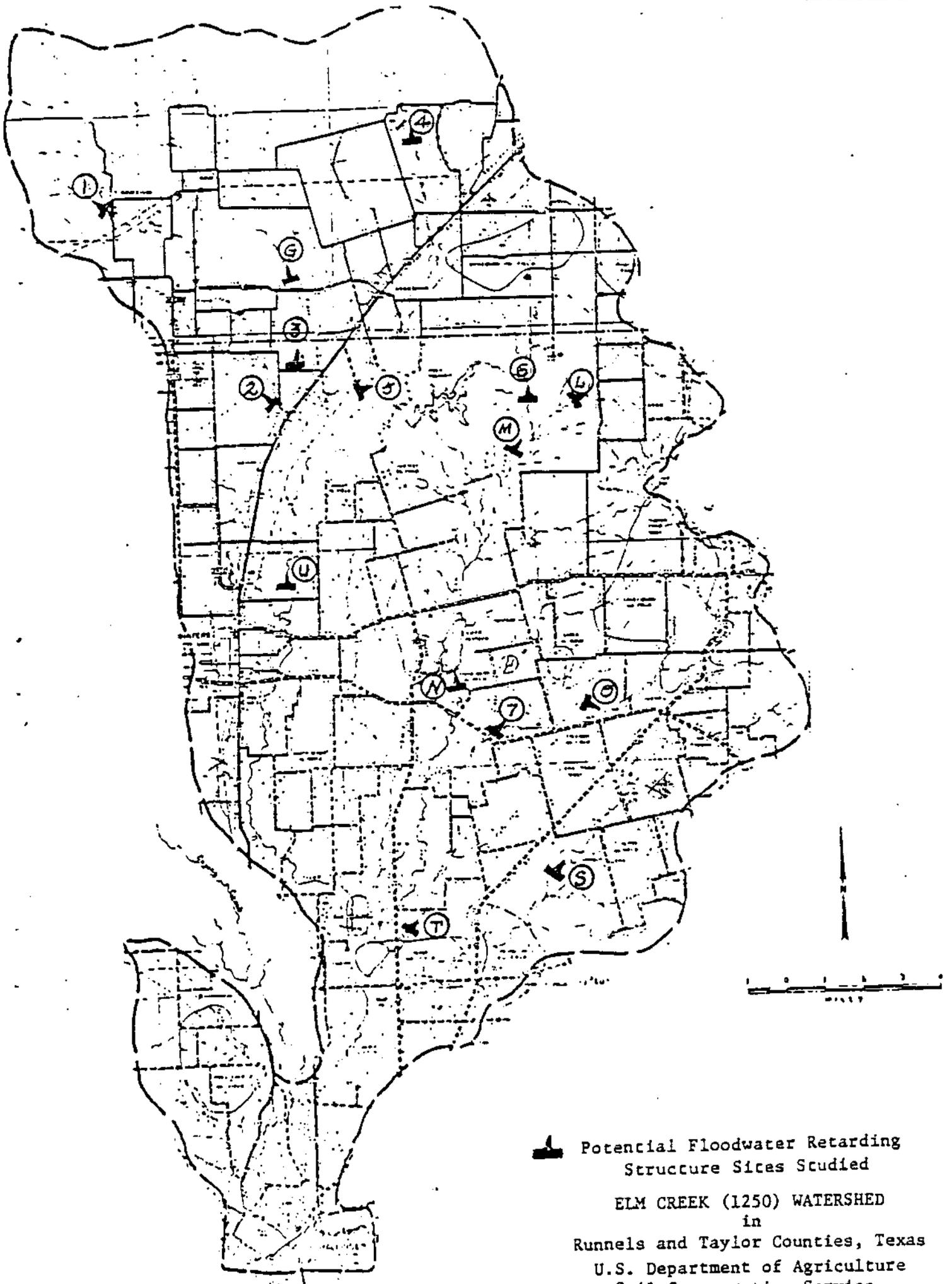
1. Destroy or inundate 24 significant archeological sites.
2. Cause the salvage of all affected archeological sites.

E. Irreversible or irretrievable commitments

1. Commit 2,161 acres to the construction and functioning of the floodwater retarding structures and dikes.
2. Commit labor, materials, and energy for construction of measures.

SOCIAL WELL-BEING ACCOUNT

<u>Components</u>	<u>Measures of effects</u>
Beneficial and adverse effects:	
A. Real Income	<ol style="list-style-type: none">1. Create 184 man-years of employment over the installation period (5 years) and 87 permanent jobs.2. Create projected regional income benefit of \$567,160.3. Local costs of \$102,310 annually will be borne by the sponsors. The percentage of contributions to local costs by income classes is not readily available.
B. Life, health, and safety	<ol style="list-style-type: none">1. Provide protection from the 100-year flood event to 113 residential properties. Future threats of loss of life and displacements in the urban areas during floods will be eliminated.



 Potential Floodwater Retarding
Structure Sites Studied
ELM CREEK (1250) WATERSHED
in
Runnels and Taylor Counties, Texas
U.S. Department of Agriculture
Soil Conservation Service

LETTERS OF COMMENT



Reply to:

3510 Watershed Protection and
Flood Prevention (PL 566)

Date:

May 11, 1981

Subject:

Elm Creek (1250) Watershed, Texas
February 1981 Draft Watershed Plan and EIS

To:

George C. Marks
State Conservationist
Soil Conservation Service
P. O. Box 648
Temple, Texas 76501

We have reviewed the subject draft watershed plan and environmental impact statement. We offer the following comments and suggestions for your consideration.

Page 13. This photo would appear to be an indictment of another Federal program, in that the houses would appear to have been built subsequent to the executive order prohibiting the expenditure of Federal funds for construction of damagable properties in a flood-prone area.

Page 33. We do not find here or elsewhere any mention of possible problems with accumulated water within the dikes or measures to prevent or minimize problems of this kind.

Page 34, par. 4, lines 17 & 19. The Heritage Conservation and Recreation Service (HCRS) has been abolished. References, other than those in the past tense, should use the agency title now responsible for this particular function.

Page 35, par. 1, line 5 and par. 7, lines 3-4. Comment on HCRS same as above.

Page 40, par. 2, line 7. Comment on HCRS same as above.

Page 53, par. 7, line 4. After Paleo-Indian, suggest changing state, to period or era.

Page 54, par.1, lines 6-7. Comment on HCRS same as above.

Page 59. It is difficult to determine just what is called for here, but it would appear that the column EXPERIENCE should account for most if not all of the individual's total experience. However, in at least three instances, total (?) EXPERIENCE is less than time spent in the present job.

We appreciate the opportunity to review and comment on the subject plan and EIS. We trust that our comments and suggestions will prove to be of use in your preparation of the next draft.

Robert D. Raisch



ROBERT D. RAISCH
Area Director



United States
Department of
Agriculture

Office of
Equal
Opportunity

Washington, D.C.
20250

MAY 15 1981

IN REPLY

REFER TO: 0140-808

SUBJECT: Draft Impact Statement Elm Creek
Watershed, Texas

TO: George C. Marks
State Conservationist

FROM: David Montoya, Director
Equal Opportunity and Civil Rights
Soil Conservation Service

You have reviewed the Draft Statement for your assessment of the impacts upon minority populations in the area. We note, with thanks, that you have identified the minority population to be benefitted (pp. 3, 5).

We appreciate your including this important information and the opportunity to comment on the Draft Statement.

JAMES FRAZIER
Director



DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

REPLY TO
ATTENTION OF:

SWFED-PR

18 June 1981

Mr. George C. Marks
Soil Conservation Service
Post Office Box 648
Temple, Texas 76501

Dear Mr. Marks:

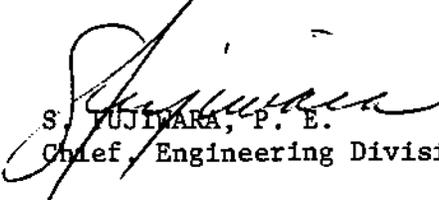
We have reviewed the Draft Environmental Impact Statement concerning the proposed watershed plan for the Elm Creek Watershed in Runnels and Taylor Counties, and have the following comments:

a) The US Army Corps of Engineers regulates the discharge of dredged and fill material into waters of the United States, including adjacent wetlands, under Section 404 of the Clean Water Act. The proposed work will occur upstream of the headwaters of Elm Creek and therefore may be authorized by a nationwide permit, requiring no administrative action, provided the conditions listed on the inclosed circular are met. If you have any further questions concerning our regulatory program, please contact Ms. Marje Schlangenstein at 817/334-2681.

b) The proposed project will not interfere with any existing or proposed Corps of Engineers projects in the Colorado River Basin.

Thank you for the opportunity to present our comments.

Sincerely,


S. FUJIWARA, P. E.
Chief, Engineering Division

1 Incl
As stated

DISCHARGES INTO CERTAIN WATERS OF THE UNITED STATES

The Corps of Engineers regulates the discharge of dredged and fill material into the waters of the United States under authority of Section 404 of the Clean Water Act (Public Law 95-217, dated 27 December 1977). A general permit has been issued on a nationwide basis for the placement of dredged and fill material into certain waters of the United States. These include: non-tidal rivers, streams, and their impoundments, including their adjacent wetlands all of which are located above the headwaters of the stream; natural lakes less than 10 acres including their adjacent wetlands; and other wetlands not associated with a tributary system. Headwaters is defined as that point on a non-tidal stream above which the average annual flow is less than five cubic feet per second. Activities authorized under the nationwide permit are subject to the following conditions:

(1) That the discharge will not destroy a threatened or endangered species as identified under the Endangered Species Act, or endanger the critical habitat of such species;

(2) That the discharge will consist of suitable material free from toxic pollutants in other than trace quantities;

(3) That the fill created by the discharge will be properly maintained to prevent erosion and other non-point sources of pollution; and

(4) That the discharge will not occur in a component of the National Wild and Scenic Rivers System or in a component of a State wild and scenic river system.

If your project is to be constructed within the terms of these criteria no further administrative action is necessary. If the project does not fit the criteria you should make application for an individual permit. Application should be made to the District Engineer; ATTN: Chief, Operations Division, SWFOD-0; P. O. Box 17300; Fort Worth, Texas 76102. If you have any further questions you may contact the Permit Section at 817-334-2681.



ALLIE J. MAJORS
Chief, Operations Division

SUGGESTED MANAGEMENT PRACTICES

In addition to the conditions specified in the nationwide permit, the management practices listed below should be followed to the maximum extent practicable, in the discharge of dredged or fill material allowed under the permit. These practices will minimize the adverse effects of the discharges on the aquatic environment..

(1) Discharges of dredged or fill material into the waters of the United States should be avoided or minimized through the use of other practical alternatives.

(2) Discharges in spawning areas during the spawning season should be avoided.

(3) Discharges should not restrict or impede the movement of aquatic species indigenous to the waters or the passage of normal or expected high flows or cause the relocation of the waters (unless the primary purpose of the fill is to impound waters).

(4) If the discharge creates an impoundment water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow should be minimized.

(5) Discharges in wetlands areas should be avoided.

(6) Heavy equipment working in wetlands should be placed on mats..

(7) Discharges into breeding and nesting areas for migratory waterfowl should be avoided.

(8) All temporary fills should be removed in their entirety.



UNITED STATES DEPARTMENT OF COMMERCE

The Assistant Secretary for Policy

Washington, D. C. 20230

JUN 8 1991

Mr. George C. Marks
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
Post Office Box 648
Temple, Texas 76501

Dear Mr. Marks:

This is in reference to your draft environmental impact statement and watershed plan entitled "Elm Creek (1250) Watershed, Runnels and Taylor Counties, Texas." The enclosed comment from the National Oceanic and Atmospheric Administration is forwarded for your consideration.

Thank you for giving us an opportunity to provide this comment, which we hope will be of assistance to you. We would appreciate receiving four copies of the final statement.

Sincerely,

Robert T. Miki
Director of Regulatory Policy

Enclosure Memo From: Robert B. Rollins
National Ocean Survey
National Oceanic and Atmospheric Administration

TO: PP/EC - Joyce M. Wood
FROM: OA/C5 - Robert B. Rollins
SUBJECT: DEIS #8104.23 - Elm Creek (1250) Watershed - Runnels and Taylor Counties, Texas

The subject statement has been reviewed within the areas of the National Ocean Survey's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Director, National Geodetic Information Center (OA/C18), or Mr. Charles Novak, Chief, Network Maintenance Branch (OA/C172), at 6001 Executive Boulevard, Rockville, Maryland 20852.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

June 3, 1981

Mr. George C. Marks
State Conservationist
Soil Conservation Service
P.O. Box 648
Temple, Texas 76501

Dear Mr. Marks:

We have completed our review of your Draft Environmental Impact Statement (EIS) for the Elm Creek Watershed, Texas. The Elm Creek Watershed consists of 238,253 acres in Runnels and Taylor Counties. This project consists of technical assistance to land users for the improvement of upland wildlife habitat, seven (7) floodwater retarding structures, and a system of floodwater dikes designed to reduce floodwater damage.

We offer the following comment for your consideration:

Please take all feasible precautions to limit impacts upon water quality, air quality and wildlife habitat. Mitigation measures should be used to control erosion and to protect archaeological sites.

We classify your Draft EIS as LD-1. Specifically, we have no objections to the project as it relates to the Environmental Protection Agency's (EPA) legislative mandates. The EIS contained sufficient information to evaluate adequately the possible environmental impacts which could result from project implementation. Our classification will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the EIS at the draft stage, whenever possible.

We appreciated the opportunity to review the Draft EIS. Please send our office five (5) copies of the Final EIS at the same time it is sent to the Office of Federal Activities, U.S. Environmental Protection Agency, Washington, D.C.

Sincerely,

A handwritten signature in cursive script that reads "Frances E. Phillips".

Frances E. Phillips
Acting Regional Administrator

Enclosure

LO - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

ADEQUACY OF THE IMPACT STATEMENT

Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make a determination.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C.

In Reply Refer To:

OEPR-DHRA
Cooperative Studies
EIS Review
Elm Creek Watershed, Texas

Mr. George C. Marks
State Conservationist
Soil Conservation Service
Department of Agriculture
Post Office Box 648
Temple, Texas 76501

Dear Mr. Marks:

This is in response to your letter of April 21, 1981, requesting our comments on the draft watershed plan and environmental impact statement for the Elm Creek (1250) Watershed, Runnels and Taylor Counties, Texas.

The proposed watershed project would consist of a system of seven floodwater retarding structures and two floodwater dikes, and the management of upland wildlife habitat.

We have reviewed the draft report to determine the effects of the proposed project on the Commission's responsibilities under the Federal Power Act, Natural Gas Act, and other authorities. Such responsibilities relate to the licensing of non-Federal hydroelectric projects, participation in the planning of Federal water and power projects, and regulation of construction and operation of natural gas pipeline facilities.

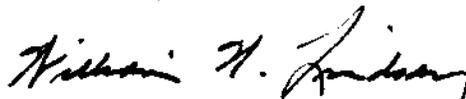
Our review indicates that the proposed watershed project would not provide opportunity for the economical development of hydroelectric power. Also, the proposed project would not have any significant effect on existing or potential hydroelectric power developments.

Our review indicates that Lone Star Gas Company operates natural gas pipelines in the proposed project area. However, from our examination of the maps included in the draft report, it appears that the proposed construction of floodwater retarding structures would not conflict with the continued operation of any pipelines.

The draft report indicates that no relocation or modification of existing pipelines would be necessary to complete the proposed project; and that two existing oil wells would be elevated to protect them from inundation. Apparently, the proposed project would not have any significant effect on the production of hydrocarbon resources from the area.

We hope that our comments will be helpful to you in the preparation of the final environmental impact statement.

Sincerely,



William W. Lindsay, Director
Office of Electric Power Regulation

(404) 262-6649

June 8, 1981

Mr. George C. Marks
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 648
Temple, Texas 75601

Dear Mr. Marks:

We have reviewed the Draft Watershed Plan and Environmental Impact Statement (EIS) on Elm Creek (1250) Watershed, Runnels and Taylor Counties, Texas. We are responding on behalf of the Public Health Service.

No mention is made of either beneficial or adverse impacts of this project on mosquito or other vector populations. The Final EIS should describe the extent of any existing or anticipated vector problems. It was noted that the EIS did contain a statement on herbicides and insecticides. It stated that only approved and authorized chemicals would be used if required and that any applications would be in accordance with current law.

Thank you for the opportunity to review this statement. We would appreciate receiving a copy of the final statement when it is issued.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FORT WORTH REGIONAL OFFICE
221 WEST LANCASTER AVENUE
P.O. BOX 2906
FORT WORTH, TEXAS 76113

REGION VI

IN REPLY REFER TO:

June 3, 1981

Mr. George C. Marks
State Conservationist
Soil Conservation Service
United States Department of Agriculture
P.O. Box 648
Temple, Texas 76501

Dear Mr. Marks:

The Draft Environmental Impact Statement for the Elm Creek (1250) Watershed in Runnels and Taylor Counties, Texas, has been reviewed in the Department of Housing and Urban Development's Dallas Area Office and Fort Worth Regional Office. The Department's review comments follow:

1. Cross-Reference to Incoming Inquiry.

The proposal is to develop a system consisting of seven floodwater retarding structures to reduce overall floodwater damage in the watershed combined with a system of floodwater dikes to further reduce floodwater damage in the urban floodplain, and to supplement those undertakings with accelerated technical assistance to land users in the improvement of upland wildlife habitat.

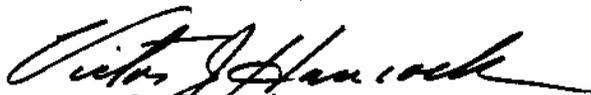
2. HUD Comments on the Statement.

- a. We noted no mention whatsoever of compliance with the requirements of the Floodplain Management Executive Order (E.O. 11988) in connection with the proposed undertaking.
- b. In our opinion, the Statement contains only the most casual and superficial discussion of the pros and cons of alternatives to the proposed action.

3. HUD Comment on the Proposal.

In view of the Austin flood disaster of a few days ago, we would not want to be placed in the position of opposing any project that has a significant potential for reducing future risks of loss of

human life. However, would be remiss if we did not point out that otherwise this proposed project appears unimpressive in terms of overall benefits versus cost. The ratio of private property savings to tax expenditure is approximately 1 to 1; the leveraging effect is quite poor.



Victor J. Hancock
Environmental Clearance Officer



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-81/878

JUN 16 1981

Mr. George C. Marks
State Conservationist
Soil Conservation Service
Post Office Box 648
~~Temple, Texas 76788~~

Dear Mr. Marks:

We have reviewed the draft watershed plan and draft environmental statement for the Elm Creek Watershed, Runnels and Taylor Counties, Texas, and have the following comments.

Mineral Resources

The final statement should show the location of the two pipelines; an 8-inch Scurlock crude oil pipeline trending NNE from the western edge of the watershed north of Ballinger and a 10-inch Gulf petroleum products pipeline in the northern part of the watershed running NNE to Abilene. Also, potential impacts should be discussed.

Cultural Resources

Although the Soil Conservation Service has made an effort to identify cultural resources in the project area, mitigation measures have not been adequately addressed. We have not received a request for funding and have not allocated funds to assist the project data recovery program (page 35). Data recovery estimates from 1978 should be updated and a viable mitigation plan should be developed in the final statement. Documentation of consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation should also be included. Determination of eligibility should be requested from the Keeper of the National Register of Historic Places. The contact for emergency discovery situations is the Secretary of the Interior through the Departmental Consulting Archeologist, Interagency Archeological Service, Washington, D.C. 20243.

Fish and Wildlife Resources

We are pleased with the proposal to provide for fish and wildlife resources in the project area. The majority of our recommendations have been included in the watershed plan. Additionally, the SCS will provide two and one-half man-years toward the improvement of 80,000 acres of upland wildlife habitat. This measure should provide substantial natural resource benefits in the watershed for which the SCS is to be commended.

Mr. George C. Marks

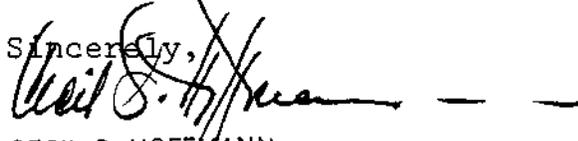
2

We urge the SCS to closely monitor this project in identifying its benefits to wildlife in order that this measure can be justified on other small watershed projects as well.

In discussing factors causing poor groundwater quality (page 17), the final statement should identify the aquifer(s) involved in the project area, indicate the significance of groundwater as a source of supply in the area, and should assess the potential for either beneficial or adverse effects of the floodwater-retarding structures on groundwater levels and quality.

Thank you for the opportunity to comment on this proposal.

Sincerely,



CECIL S. HOFFMANN

Special Assistant to
SECRETARY

Assistant

OFFICE OF THE GOVERNOR

THOMAS P. CLEMENTS, JR.
GOVERNOR

June 11, 1981

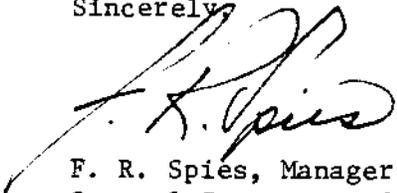
Mr. George C. Marks, State Conservationist
Soil Conservation Service, U. S. Department
of Agriculture
P. O. Box 648
Temple, Texas 76501

Dear Mr. Marks:

The draft environmental impact statement pertaining to Elm Creek watershed, Texas, prepared by your office, has been reviewed by the Budget and Planning Office and interested state agencies. Copies of the review comments are enclosed for your information and use. The State Environmental Impact Statement Identifier Number assigned to the project is 1-04-50-054.

The Budget and Planning Office appreciates the opportunity to review this project. If we can be of any further assistance during the environmental review process, please do not hesitate to call.

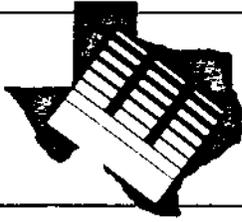
Sincerely,



F. R. Spiess, Manager
General Government Section
Budget and Planning Office

ep

Enclosures: Comments by State Department of Highways and
Public Transportation
Texas Department of Water Resources
Railroad Commission of Texas
Governor's Office of Regional Development
Texas State Soil and Water Conservation
Board
General Land Office
Texas Department of Health
Texas Parks and Wildlife Department
Bureau of Economic Geology



**Texas
Agricultural
Extension
Service**

The Texas A&M University System
College Station 77843

348 Soil & Crop Sciences Building
May 4, 1981

Mr. George C. Marks
State Conservationist
SCS
P.O. Box 648
Temple, Texas 76501

Dear George:

Dr. H. O. Kunkle received a copy of the Watershed Plan and Environmental Impact Statement for the Elm Creek Watershed Project, as did I. We have reviewed the plan and statement and find them in proper order. We have no suggestions to offer for substantive changes. As you are aware, Texas A&M University and the Texas Agricultural Extension Service fully support projects of this type. We recognize the value of these efforts to the people and resources of those areas.

We are appreciative for your keeping us informed of these and related activities.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "B. L. Harris".

B. L. Harris
Soil & Water Use Specialist

cc: Dean H. O. Kunkle
Dr. E. M. Trew



RECEIVED
EGW

MAY 5 1981

OFFICE OF THE GOVERNOR

Budget/Planning

April 29, 1981

TRANSMITTAL MEMORANDUM

WILLIAM P. CLEMENTS, JR.
GOVERNOR

TO: Review Participants

-DATE COMMENTS DUE TO
BUDGET AND PLANNING OFFICE: 6/1/81

- Aeronautics Commission
- Air Control Board
- Animal Health Commission
- Bureau of Economic Geology
- Coastal and Marine Council
- Department of Agriculture
- Department of Health
- Department of Highways and Public Transportation
- Department of Water Resources
- Texas Forest Service
- General Land Office
- Historical Commission

- Industrial Commission
- Parks and Wildlife Department
- Public Utilities Commission
- Railroad Commission
- Soil and Water Conservation Board
- Texas Energy and Natural Resources Advisory Council
- Governor's Office of Regional Development
- Texas Dept. of Community Affairs

Draft EIS Other EIS Number 1-04-50-054

Project Title Elm Creek Watershed Plan

Taylor and Runnels Counties

Originating Agency U.S. Department of Agriculture, Soil Conservation Service

Pursuant to the National Environmental Policy Act of 1969, Office of Management and Budget Circular A-95, and the Texas Policy for the Environment (1975), the Governor's Budget and Planning Office is responsible for securing the comments and views of local and State agencies during the environmental impact statement review process.

Enclosed for your review and comment is a copy of the above cited document. This Office solicits your comments and asks that they be returned on or before the above due date. You may find the questions, listed on the reverse side, useful in formulating your comments.

For questions on this project, contact Ward Goessling at (512) 475-2427.

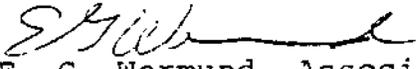
Please address your agency's formal comments to: Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
P.O. Box 12428
Austin, Texas 78711

Suggested Questions to be Considered by Reviewing Agencies:

1. Does the proposed project impact upon and is it consistent with the plans, programs and statutory responsibilities of your agency?
2. What additional specific effects should be assessed?
3. What additional alternatives should be considered?
4. What better or more appropriate measures and standards should be used to evaluate environmental effects?
5. What additional control measures should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources?
6. How serious would the environmental damage from this project be, using the best alternative and control measures?
7. What specific issues require further discussion or resolution?
8. Does your agency concur with the implementation of this project?

As a part of the environmental impact statement review process, the Budget and Planning Office forwards to the originating agency all substantive comments which are formally submitted. If, after analyzing this document, you conclude that substantive comments are unnecessary, you may wish to so indicate by checking the box below and forwarding the form to this office. This type of response will indicate receipt of this document by your agency and that no formal response will be prepared.

No Comment.


E. G. Wermund, Associate Director

Name and Title of Reviewing Official
Bureau of Economic Geology
The University of Texas at Austin
University Station Box X

Austin, Texas Agency
78712



TEXAS FOREST SERVICE

The Texas A&M University System

Forest Environment Department
(713) 845-2641

College Station, Texas 77843

P-5.321233

May 22, 1981

Mr. George C. Marks
State Conservationist
USDA Soil Conservation Service
P. O. Box 648
Temple, Texas 76501

Dear George:

Thank you for sending us a copy of the Draft Watershed Plan and Environmental Impact Statement for the Elm Creek Watershed, Runnels and Taylor Counties, Texas.

We consider the project plan well written and concur in its implementation. In addition, we also offer the use of forest tree seedlings from our Indian Mound and West Texas Nurseries supportive of wildlife habitat enhancement.

This is in no way critical, but it was my understanding that the terminology "Prime Farmlands" had been replaced with the more acceptable wording (definition) "Prime Farmland Soils"...the former was used throughout the text as far as I could tell.

Thank you for the opportunity to review and present our comments on the above cited plan.

Sincerely,

Mason C. Cloud
Head, Forest Environment Dept.

MCC/mj

Mr. Paul T. Wrotenbery

Page Two

May 19, 1981

Based upon the information contained in the subject document, no adverse public or environmental health conditions are expected to arise for the proposed actions.

We appreciate the opportunity to review and comment on the Elm Creek Watershed Plan and EIS.

Sincerely,



G. R. Herzik, Jr., P.E.
Deputy Commissioner for Environmental
and Consumer Health Protection

RLJ/dbs

ccs: Program Budgetary Services, TDH
Public Health Region 4, TDH
Taylor County Health Department
Local Health Services, TDH
Mr. Jerry Fleming, Freese and
Nichols, Fort Worth



COMMISSION

A. SAM WALDROP, CHAIRMAN
ROBERT H. DEDMAN
JOHN R. BUTLER, JR.

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

AUSTIN, TEXAS 78701

ENGINEER-DIRECTOR
MARK G. GOODE

June 2, 1981

IN REPLY REFER TO
FILE NO.

D8-E 854

Draft Watershed Plan and EIS
Elm Creek Watershed
Runnels and Taylor Counties

RECEIVED

JUN 4 1981

Budget/Planning

Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Sam Houston Building, 7th Floor
Austin, Texas

Dear Mr. Wrotenbery:

Thank you for your memorandum dated April 29, 1981, transmitting the draft watershed plan and environmental impact statement covering Elm Creek.

We do not anticipate any adverse effects to existing or proposed highways on the State Highway system as the result of the proposed system of floodwater dikes and floodwater retarding structures.

Sincerely yours,

M. G. Goode
Engineer-Director

By: *Marcus L. Yancey, Jr.*
Marcus L. Yancey, Jr.
Deputy Engineer-Director



RECEIVED

MAY 27 1981

RECEIVED

MAY 01 '81

COASTAL DIV.

OFFICE OF THE GOVERNOR Budget/Planning

April 29, 1981

TRANSMITTAL MEMORANDUM

WILLIAM P. CLEMENTS, JR.
GOVERNOR

TO: Review Participants

DATE COMMENTS DUE TO
BUDGET AND PLANNING OFFICE: 6/1/81

- Aeronautics Commission
- Air Control Board
- Animal Health Commission
- Bureau of Economic Geology
- Coastal and Marine Council
- Department of Agriculture
- Department of Health
- Department of Highways and Public Transportation
- Department of Water Resources
- Texas Forest Service
- General Land Office
- Historical Commission

- Industrial Commission
- Parks and Wildlife Department
- Public Utilities Commission
- Railroad Commission
- Soil and Water Conservation Board
- Texas Energy and Natural Resources Advisory Council
- Governor's Office of Regional Development
- Texas Dept. of Community Affairs

Draft EIS Other EIS Number 1-04-50-054

Project Title Elm Creek Watershed Plan

Taylor and Runnels Counties

Originating Agency U.S. Department of Agriculture, Soil Conservation Service

Pursuant to the National Environmental Policy Act of 1969, Office of Management and Budget Circular A-95, and the Texas Policy for the Environment (1975), the Governor's Budget and Planning Office is responsible for securing the comments and views of local and State agencies during the environmental impact statement review process.

Enclosed for your review and comment is a copy of the above cited document. This Office solicits your comments and asks that they be returned on or before the above due date. You may find the questions, listed on the reverse side, useful in formulating your comments.

For questions on this project, contact Ward Goessling at (512) 475- 2427.

Please address your agency's formal comments to: Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
P.O. Box 12428
Austin, Texas 78711

Suggested Questions to be Considered by Reviewing Agencies:

1. Does the proposed project impact upon and is it consistent with the plans, programs and statutory responsibilities of your agency?
2. What additional specific effects should be assessed?
3. What additional alternatives should be considered?
4. What better or more appropriate measures and standards should be used to evaluate environmental effects?
5. What additional control measures should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources?
6. How serious would the environmental damage from this project be, using the best alternative and control measures?
7. What specific issues require further discussion or resolution?
8. Does your agency concur with the implementation of this project?

As a part of the environmental impact statement review process, the Budget and Planning Office forwards to the originating agency all substantive comments which are formally submitted. If, after analyzing this document, you conclude that substantive comments are unnecessary, you may wish to so indicate by checking the box below and forwarding the form to this office. This type of response will indicate receipt of this document by your agency and that no formal response will be prepared.

No Comment.

Bob Blewburg
Name and Title of Reviewing Official

GENERAL LAND OFFICE
Agency

*THERE are no Public Free School tracts located within
the Elm Creek watershed.*

PARKS AND WILDLIFE DEPARTMENT



COMMISSIONERS

W. B. OSBORN, JR.
Santa Elena

WM. O. BRAECKLEIN
Dallas

WM. M. WHELESS, III
Houston

COMMISSIONERS

PERRY R. BASS
Chairman, Fort Worth

JAMES R. PAXTON
Vice-Chairman, Palestine

EDWIN L. COX, JR.
Athens

CHARLES O. TRAVIS
EXECUTIVE DIRECTOR

4200 Smith School Road
Austin, Texas 78744

RECEIVED

MAY 21 1981

Budget/Planning

May 20, 1981

Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
Post Office Box 13561, Capitol Station
Austin, Texas 78711

RE: Elm Creek Watershed Plan, Taylor and Runnels Counties
(EIS No. 1-04-50-054)

Dear Mr. Wrotenbery:

This agency has reviewed the above-referenced project and offers the following comments.

In consideration of the overall project and the planning efforts that pertain to wildlife resources, the Soil Conservation Service (SCS) should be complimented. Specific measures such as seeding disturbed areas with a mixture of native grasses, fencing areas of the sediment pools, and leaving valuable woody vegetation undisturbed would be beneficial to wildlife.

This agency is particularly pleased that a wildlife biologist will be employed on a one-half time basis to provide assistance to landowners in the watershed. To assist in this effort, I would like to volunteer my staff to work with the SCS biologist in the development of wildlife management plans that could be implemented by landowners.

I appreciate the opportunity to review and comment on the project.

Sincerely,

Charles D. Travis
Executive Director

CDT:RWS:mlh



RECEIVED
B.B.C. OF TEXAS

MAY 04 1981

U.C.
AUSTIN, TEXAS

OFFICE OF THE GOVERNOR

WILLIAM P. CLEMENTS, JR.
GOVERNOR

April 29, 1981
TRANSMITTAL MEMORANDUM

TO: Review Participants

DATE COMMENTS DUE TO
BUDGET AND PLANNING OFFICE: 6/1/81

- Aeronautics Commission
- Air Control Board
- Animal Health Commission
- Bureau of Economic Geology
- Coastal and Marine Council
- Department of Agriculture
- Department of Health
- Department of Highways and Public Transportation
- Department of Water Resources
- Texas Forest Service
- General Land Office
- Historical Commission

- Industrial Commission
- Parks and Wildlife Department
- Public Utilities Commission
- Railroad Commission
- Soil and Water Conservation Board
- Texas Energy and Natural Resources Advisory Council
- Governor's Office of Regional Development
- Texas Dept. of Community Affairs

Draft EIS Other _____ EIS Number 1-04-50-054

Project Title Elm Creek Watershed Plan

Taylor and Runnels Counties

Originating Agency U.S. Department of Agriculture, Soil Conservation Service

Pursuant to the National Environmental Policy Act of 1969, Office of Management and Budget Circular A-95, and the Texas Policy for the Environment (1975), the Governor's Budget and Planning Office is responsible for securing the comments and views of local and State agencies during the environmental impact statement review process.

Enclosed for your review and comment is a copy of the above cited document. This Office solicits your comments and asks that they be returned on or before the above due date. You may find the questions, listed on the reverse side, useful in formulating your comments.

For questions on this project, contact Ward Goessling at (512) 475-2427.

Please address your agency's formal comments to: Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
P.O. Box 12428
Austin, Texas 78711

Suggested Questions to be Considered by Reviewing Agencies:

1. Does the proposed project impact upon and is it consistent with the plans, programs and statutory responsibilities of your agency?
2. What additional specific effects should be assessed?
3. What additional alternatives should be considered?
4. What better or more appropriate measures and standards should be used to evaluate environmental effects?
5. What additional control measures should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources?
6. How serious would the environmental damage from this project be, using the best alternative and control measures?
7. What specific issues require further discussion or resolution?
8. Does your agency concur with the implementation of this project?

As a part of the environmental impact statement review process, the Budget and Planning Office forwards to the originating agency all substantive comments which are formally submitted. If, after analyzing this document, you conclude that substantive comments are unnecessary, you may wish to so indicate by checking the box below and forwarding the form to this office. This type of response will indicate receipt of this document by your agency and that no formal response will be prepared.

No Comment.

June 1, 1981


Name and Title of Reviewing Official
Murray C. Moffatt
Engineer
Railroad Commission of Texas (Oil & Gas Division)
Agency



RECEIVED

OFFICE OF THE GOVERNOR

JUN 1 1981

WILLIAM P. CLEMENTS, JR.
GOVERNOR

April 29, 1981
TRANSMITTAL MEMORANDUM

Budget/Planning

TO: Review Participants

DATE COMMENTS DUE TO
BUDGET AND PLANNING OFFICE: 6/1/81

- Aeronautics Commission
- Air Control Board
- Animal Health Commission
- Bureau of Economic Geology
- Coastal and Marine Council
- Department of Agriculture
- Department of Health
- Department of Highways and Public Transportation
- Department of Water Resources
- Texas Forest Service
- General Land Office
- Historical Commission

- Industrial Commission
- Parks and Wildlife Department
- Public Utilities Commission
- Railroad Commission
- Soil and Water Conservation Board
- Texas Energy and Natural Resources Advisory Council
- Governor's Office of Regional Development
- Texas Dept. of Community Affairs
- _____
- _____
- _____

Draft EIS Other _____ EIS Number 1-04-50-054

Project Title Elm Creek Watershed Plan
Taylor and Runnels Counties

Originating Agency U.S. Department of Agriculture, Soil Conservation Service

Pursuant to the National Environmental Policy Act of 1969, Office of Management and Budget Circular A-95, and the Texas Policy for the Environment (1975), the Governor's Budget and Planning Office is responsible for securing the comments and views of local and State agencies during the environmental impact statement review process.

Enclosed for your review and comment is a copy of the above cited document. This Office solicits your comments and asks that they be returned on or before the above due date. You may find the questions, listed on the reverse side, useful in formulating your comments.

For questions on this project, contact Ward Goessling at (512) 475-2427.

Please address your agency's formal comments to: Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
P.O. Box 12428
Austin, Texas 78711

Suggested Questions to be Considered by Reviewing Agencies:

1. Does the proposed project impact upon and is it consistent with the plans, programs and statutory responsibilities of your agency?
2. What additional specific effects should be assessed?
3. What additional alternatives should be considered?
4. What better or more appropriate measures and standards should be used to evaluate environmental effects?
5. What additional control measures should be applied to reduce adverse environmental effects or to avoid or minimize the irreversible or irretrievable commitment of resources?
6. How serious would the environmental damage from this project be, using the best alternative and control measures?
7. What specific issues require further discussion or resolution?
8. Does your agency concur with the implementation of this project?

As a part of the environmental impact statement review process, the Budget and Planning Office forwards to the originating agency all substantive comments which are formally submitted. If, after analyzing this document, you conclude that substantive comments are unnecessary, you may wish to so indicate by checking the box below and forwarding the form to this office. This type of response will indicate receipt of this document by your agency and that no formal response will be prepared.

No Comment.


Name and Title of Reviewing Official
Richard T. Montoya, Director
Governor's Office of Regional Development
Agency



TEXAS STATE SOIL AND WATER CONSERVATION BOARD

1002 First National Building
P. O. Box 658
Temple, Texas 76501
Area Code 817, 773-2250

RECEIVED

May 26, 1981

MAY

Bud.

Mr. Paul T. Wrotenbery, Director
Governor's Budget and Planning Office
Attention: General Government Section
P.O. Box 12428
Austin, TX 78711

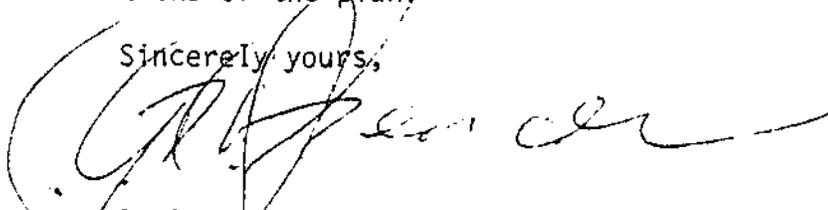
Dear Mr. Wrotenbery:

We have reviewed the draft Watershed Plan and Environmental Impact Statement for the Elm Creek Watershed, Runnels and Taylor Counties, prepared by the U.S.D.A., Soil Conservation Service.

This agency received the application for assistance on this project on April 5, 1967. Since that time we have worked with the sponsors on numerous occasions attempting to ensure that their objectives would receive federal assistance. The State Soil and Water Conservation Board granted a planning priority on this project on March 22, 1973.

Our involvement with the sponsors and the Soil Conservation Service staff working on the project leads us to believe that the objectives of the sponsors will be satisfied by this work plan and that the project measures called for in the work plan are the best practicable solution to the watershed problems. We urge that all associated with the project from this point forward seek expedient implementations of the plan.

Sincerely yours,



A. C. Spencer
Executive Director

ACS/JMM/vd

TEXAS DEPARTMENT OF WATER RESOURCES

1700 N. Congress Avenue

Austin, Texas



Harvey Davis
Executive Director

June 1, 1981

TEXAS WATER DEVELOPMENT BOARD

Louis A. Beecherl, Jr., Chairman

John H. Garrett, Vice Chairman

George W. McCleskey

Glen E. Roney

W. O. Bankston

Lonnie A. "Bo" Pilgrim

TEXAS WATER COMMISSION

Felix McDonald, Chairman

Dorsey B. Hardeman

Joe R. Carroll

RECEIVED

JUN 5 1981

Budget/Planning

Mr. Paul T. Wrotenbery, Director
Governors Budget and Planning Office
P.O. Box 13561, Capitol Station
Austin, Texas 78711

Dear Mr. Wrotenbery:

Re: U.S. Department of Agriculture, Soil Conservation Service (USDA-SCS): Draft Watershed Plan and Environmental Impact Statement (WP-EIS) on Elm Creek 1250) Watershed, Runnels and Taylor Counties, Texas, Colorado River Basin, February 1981. (State File Reference: EIS-1-04-50-054).

In response to your April 29 memorandum, the staff of the Texas Department of Water Resources (TDWR) has reviewed the referenced draft report, prepared by the USDA-SCS in collaboration with the local sponsors (i.e., the City of Ballinger, the Elm Creek Water Control District, et. al.), pursuant to the authority contained in P.L. 83-566 (Watershed Protection and Flood Prevention Act), and P.L. 91-190 (National Environmental Policy Act), and the implementing federal regulations. The referenced report pertains to the proposed federal/local, five-year phased construction and installation project at an estimated total cost of \$5,576,530 involving: (1) the construction of seven floodwater-retarding structures, with a total storage capacity of 15,099 acre-feet, to help reduce flooding on portions of 150 rural farm-unit properties, and 113 urban residential properties in the City of Ballinger, totalling approximately 12,390 acres, lying within the 100-year floodplains of Elm Creek and tributaries; (2) the construction of 6,568 linear-feet of earth dikes in the southern part of the City of Ballinger to further reduce flooding levels on the 113 residential properties, referred to in (1) above; and (3) the furnishing of technical assistance by USDA-SCS to landowners and landusers (in addition to the on-going program of technical assistance provided by USDA-SCS through the State Soil and Water Conservation Districts) to encourage landowners and landusers, to incorporate in their land treatment programs on a cooperative basis, specific measures designed to enhance wildlife upland habitat resources and management.

TDWR offers the following staff review comments, from the standpoint of TDWR's water-related responsibilities under the Texas Water Code, and the associated implementing rules:

Mr. Paul T. Wrotenbery, Director

Page 2

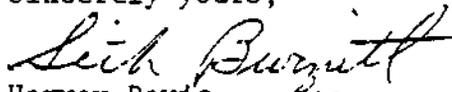
June 1, 1981

1. The staff concurs in principle with the proposed joint decision and agreement to be made by the USDA-SCS and the local project sponsors to: (a) encourage landowners and operators to maintain land treatment practices; (b) obtain agreements from land users of not less than 50 percent of the land upstream of each reservoir and floodwater-retarding structure that they will carry out conservation plans on their lands, and that a minimum of 50 percent of the land upstream from each floodwater-retarding structure will be adequately protected from soil erosion before the construction of the said structures (p. 38); (c) construct the City of Ballinger flood protection dikes after the construction of the seven floodwater-retarding structures (pp. 37 and 39).

This sequence of project accomplishment is deemed essential in order to ensure reasonable control of soil erosion and reduction in the expected high rates of reservoir siltation; a prolongation in the effective life of the reservoirs; and, a reduction in reservoir maintenance costs. These objectives are especially desirable also in the case of the future, planned City of Ballinger water supply storage reservoir to be constructed at Site "N", below the existing Lake Winters on Elm Creek (pp. Summary and 17, 23, 24, 45, and 85).

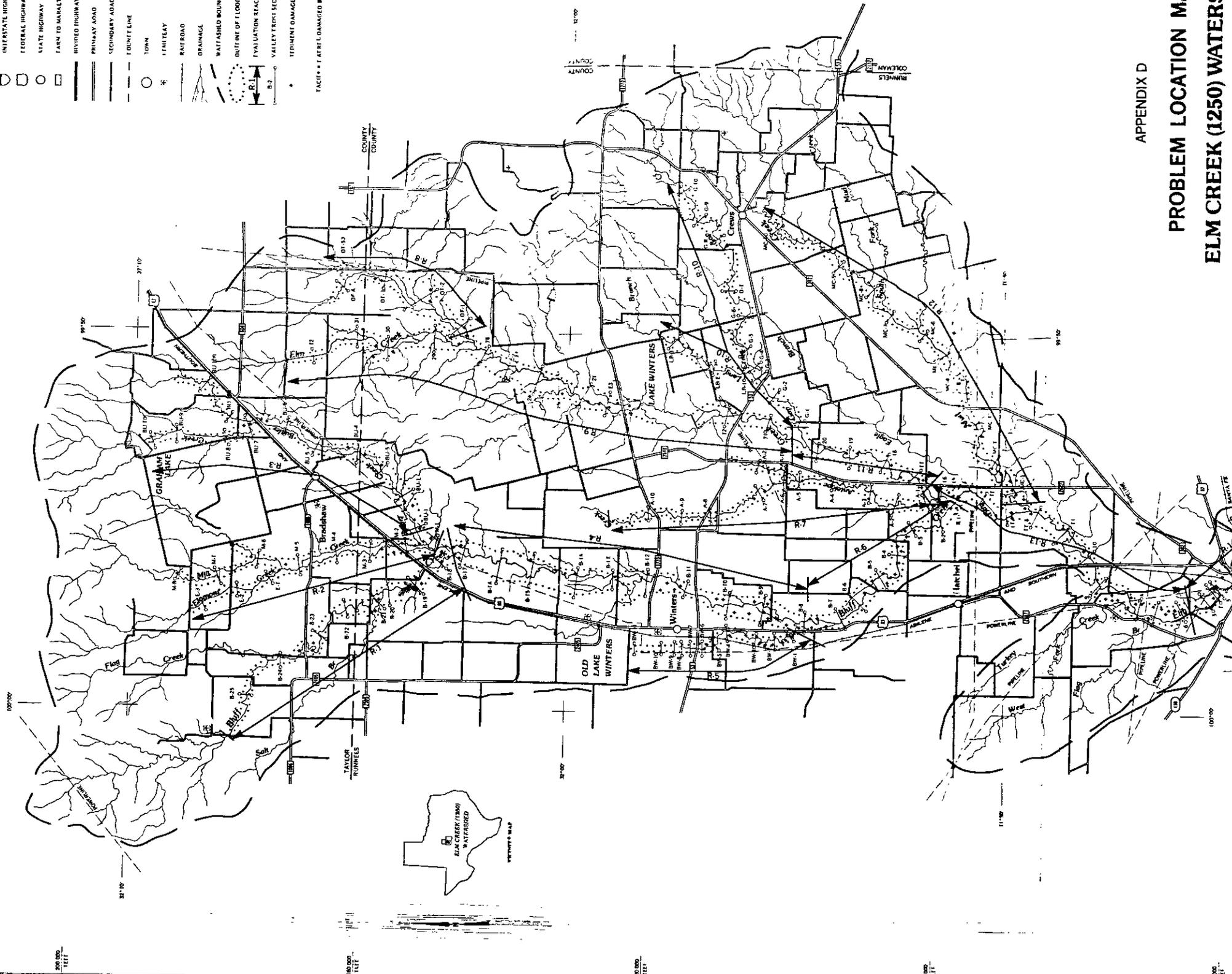
2. The TDWR staff concurs in principle with the total watershed development concept reflected in the report. The proposed plan appears to be reasonably consistent with the USDA-SCS's manual: Erosion and Sediment Control Guidelines for Developing Areas in Texas (1976), and with TDWR's report, LP-66: Flood Hazard Evaluation Guidelines for Texas State Agencies (1978). The plan appears to properly incorporate elements based on sound reclamation practice and policy that successful operation of dams and reservoirs requires:
 - a. the watershed areas upstream of the reservoirs be managed in a mutually compatible manner;
 - b. the released regulated waters will enable downstream lands to be developed and used to better advantage; and,
 - c. the project operations will result in attaining and maintaining both the potential productivity and the present production, in consonance with the hydrologic functions of the land--with the multiobjectives of producing food, forage, wood, wildlife, minerals, recreation, and water, now and in the future.

Sincerely yours,


Harvey Davis
Executive Director

- LEGEND**
- INTERSTATE HIGHWAY
 - FEDERAL HIGHWAY
 - STATE HIGHWAY
 - FARM TO MARKET ROAD
 - REVISED HIGHWAY
 - PRIMARY ROAD
 - SECONDARY ROAD
 - COUNTY LINE
 - TOWN
 - 1 UNIT TAYLOR
 - RAILROAD
 - DRAINAGE
 - WATERFED BOUNDARY
 - OUTLINE OF FLOODWATER DAMAGE
 - EVALUATION REACH
 - VALLEY TRIM SECTION
 - SETBACK DAMAGE

TACTS - FATHS DAMAGED BY FLOODING



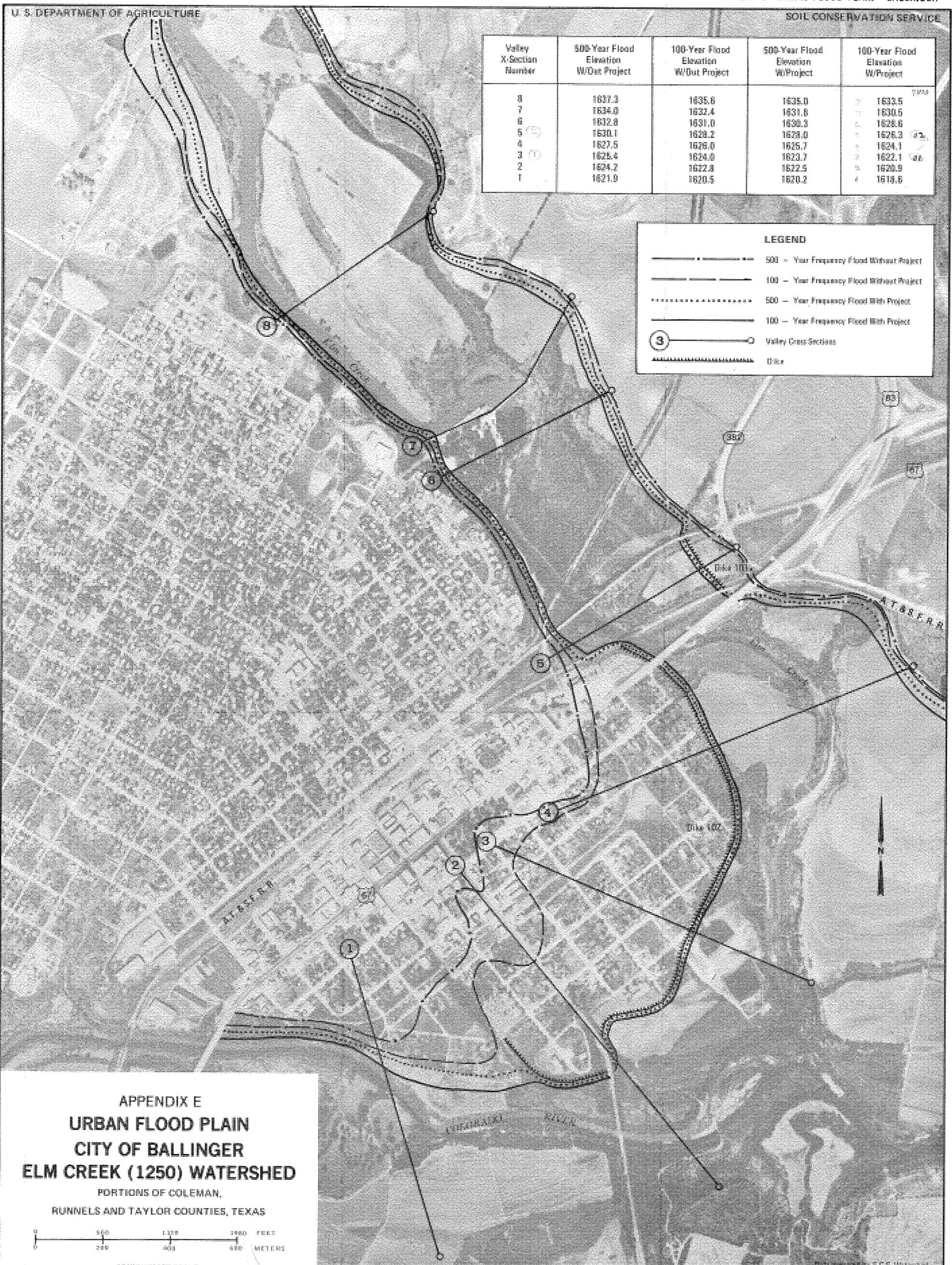
U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Valley X-Section Number	500-Year Flood Elevation W/Out Project	100-Year Flood Elevation W/Out Project	500-Year Flood Elevation W/Project	100-Year Flood Elevation W/Project
8	1637.3	1635.6	1635.0	1633.5
7	1634.0	1632.4	1631.6	1630.6
6	1632.9	1631.0	1630.3	1628.6
5	1630.1	1628.2	1628.0	1626.3
4	1627.5	1626.0	1625.7	1624.1
3	1626.4	1624.6	1623.7	1622.1
2	1624.2	1622.8	1622.5	1620.9
1	1621.9	1620.5	1620.2	1618.6

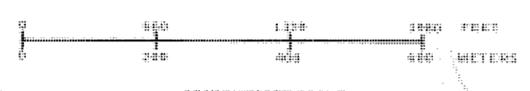
LEGEND

- 500 - Year Frequency Flood Without Project
- 100 - Year Frequency Flood Without Project
- 500 - Year Frequency Flood With Project
- 100 - Year Frequency Flood With Project
- Valley Cross Sections
- ▬ Dike



**APPENDIX E
URBAN FLOOD PLAN
CITY OF BALLINGER
ELM CREEK (1250) WATERSHED**

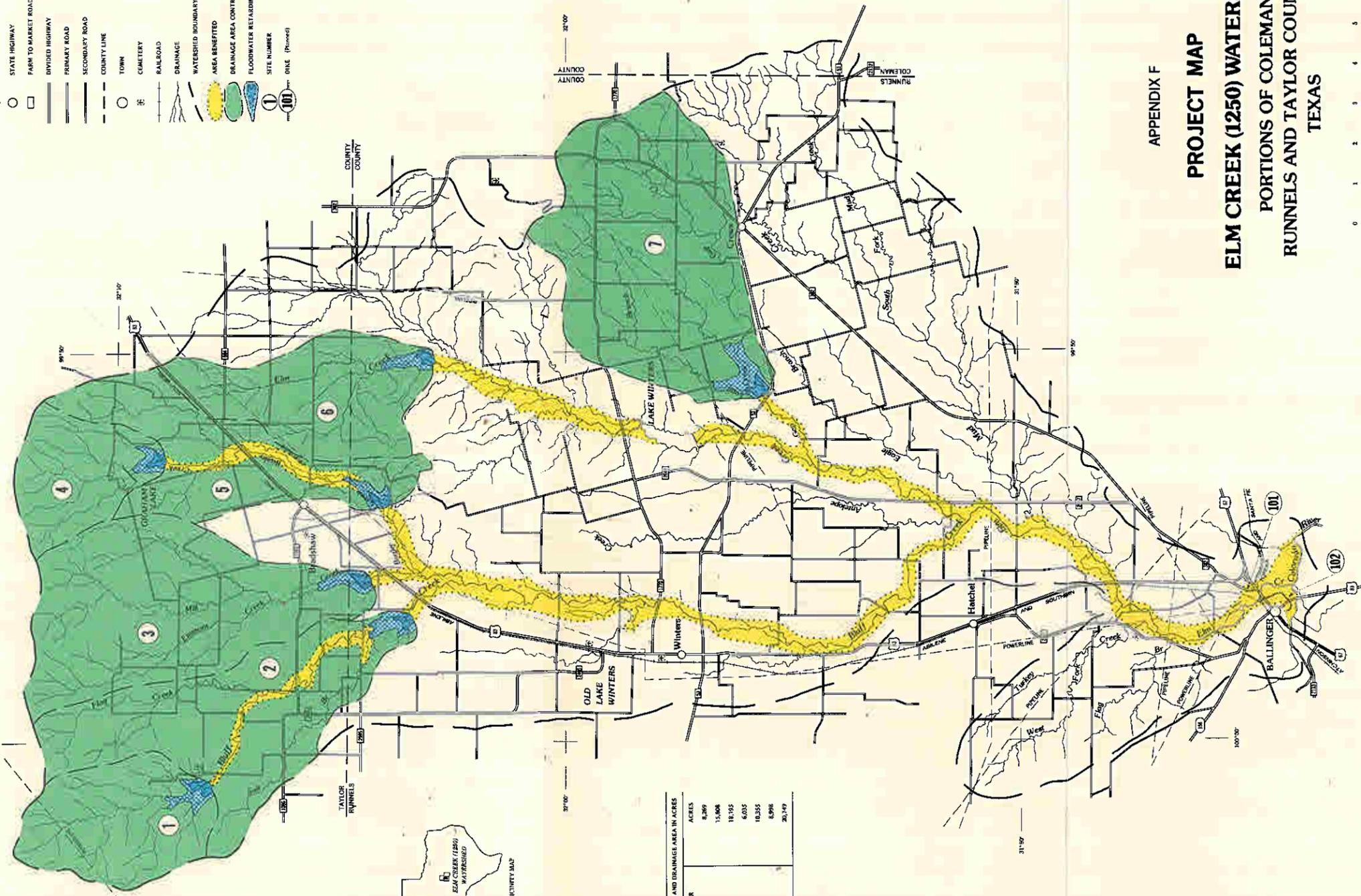
PORTIONS OF COLEMAN,
RUNNELS AND TAYLOR COUNTIES, TEXAS



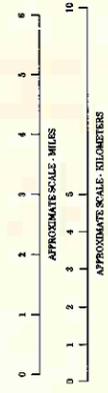
APPROXIMATE SCALE

TR20
W/INP
1623.4
1621.6

- LEGEND**
- INTERSTATE HIGHWAY
 - FEDERAL HIGHWAY
 - STATE HIGHWAY
 - FARM TO MARKET ROAD
 - DIVIDED HIGHWAY
 - PRIMARY ROAD
 - SECONDARY ROAD
 - COUNTY LINE
 - TOWN
 - CEMETERY
 - RAILROAD
 - DRAINAGE
 - WATERSHED BOUNDARY
 - AREA BENEFITED
 - DRAINAGE AREA CONTROLLED BY STRUCTURE
 - FLOODWATER RETAINING STRUCTURE
 - SITE NUMBER
 - 101
 - 102



APPENDIX F
PROJECT MAP
ELM CREEK (1250) WATERSHED
PORTIONS OF COLEMAN,
RUNNELS AND TAYLOR COUNTIES
TEXAS



BASE COMPILED FROM USGS QUADRANGLE SHEETS AND TEXAS GENERAL HIGHWAY MAP, POLYCONIC PROJECTION. 60,000 FOOT GRID TIEED BASED ON TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE.

APPROXIMATE DRAINAGE AREA 284,283 ACRES