ENVIRONMENTAL IMPACT STATEMENT
FOR
DEER CREEK WATERSHED

BOLIVAR AND WASHINGTON COUNTIES, MISSISSIPPI

DECEMBER 1975

PREPARED BY
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Jackson, Mississippi 39205

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Deer Creek Watershed
Bolivar and Washington Counties, Mississippi

Final Environmental Impact Statement

W. L. Heard, State Conservationist
Soil Conservation Service

Sponsoring Local Organizations

Deer Creek Water Management District
Scott, Mississippi

Bolivar County Soil and Water Conservation District
Cleveland, Mississippi

Washington County Soil and Water Conservation District
Greenville, Mississippi

December 1975

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U. S. Department of Agriculture
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Deer Creek Watershed Project

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Prepared in accordance with
Sec. 102 (2) (C) of P.L. 91-190

Summary Sheet

I Final

II Soil Conservation Service

III Administrative

IV Description of project purpose and action: The purpose of this project is to solve or reduce the land, water, and natural resource problems (erosion, sedimentation, flooding, drainage, and low income) by utilization of conservation land treatment measures and multiple purpose channels. The planned channel work consists of 50.1 miles of multiple purpose channels and includes 13.66 miles of channel clearing and shaping (type-class III) and approximately 36.49 miles of channel enlargement (type-class II). Stream channels include both natural and man-made channels. Existing streams are intermittent and/or ephemeral.

V Environmental impacts including favorable and adverse effects: The installation of the project will reduce gross erosion by 20 percent, reduce overbank runoff by 60 percent, and long term sediment deposition and downstream sediment delivery by about 12 percent. Floodwater and drainage damages will be reduced on 20,368 acres of agricultural land that have water problems. Water quality in the lakes and streams and the physical and hydrologic properties and fertility of the soils will be improved. Fisheries resources and habitat will be enhanced by the reduction of sediment and agricultural chemicals in lakes and downstream areas and by the formation of sediment traps in channel bottoms. Waterfowl habitat will be enhanced by the installation of 50 wood duck nesting boxes. Approximately 435 acres of wetlands will be preserved. Vector habitat will be reduced and the employment opportunities and the standard of living of the people will be increased. Approximately 50 miles of existing stream fisheries resources will be altered by the proposed channel work. There will be a decrease in stream diversity and fish production immediately after channel work completion. Forest land wildlife habitat will be lost on 341 acres and approximately 89 acres of wetlands will be subject to drainage as a result of the structural measures. Agricultural and silviculture production will be lost or decreased on 820 acres of land committed to structural measures. Lowered water tables in the immediate vicinity of improved channels will affect timber growth and mast

production. Water quality will be reduced in the streams below construction areas during construction and there will be air and noise pollution during the construction period.

VI Alternatives considered and evaluated were:

(1) The establishment of needed land treatment at an accelerated rate.
(2) Land treatment in combination with channel clearing activities only.
(3) Land treatment in combination with flood proofing and conversion of land to uses less susceptible to flood damage.
(4) Land treatment in combination with construction of levees complete with series of drainage gates and pumps.
(5) Land treatment and channel activities consisting of excavated floodway.
(6) No project.

VII Agencies from which comments were received:

U. S. Department of Commerce
U. S. Department of Health, Education, and Welfare
U. S. Department of the Interior
Office of Equal Opportunity - USDA
Environmental Protection Agency
Federal State Programs, Office of the Governor
Delta Council

VIII Draft statement transmitted to CEQ on September 8, 1975.
date

USDA Soil Conservation Service

Final Environmental Impact Statement
for
Deer Creek Watershed
Bolivar and Washington Counties, Mississippi

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 Stat. 666, as amended.

Sponsoring Local Organizations

The Sponsoring Local Organizations are: Deer Creek Water Management District, Bolivar County Soil and Water Conservation District, and Washington County Soil and Water Conservation District.

Project Objectives and Purposes

Problems common to the watershed area resulted in discussions between members of the local sponsoring organizations and representatives of the Soil Conservation Service. After this discussion and a determination of problems and potential solutions, project objectives were formulated. Primary objectives expressed by the sponsors were watershed protection, flood protection, agricultural water management (drainage), and the improvement of the economic status of the inhabitants of the watershed.

The local sponsors desired to establish a complete soil and water conservation program for the watershed. Some specific objectives were:

1. Establish adequate treatment for erosion control, sediment reduction and land protection for an additional 53 percent of the watershed during the installation period.
2. Attain sufficient flood reduction and protective measures on lowland portions of the watershed to allow continued agricultural use of the land.
3. To improve efficiency of farming operations and the quantity and quality of production, thereby increasing the relatively low income that affects the economy of the people of the watershed.

The sponsors considered the impacts, both favorable and adverse, in developing the plan for meeting stated and other objectives. The overall project objective is the conservation, development, and productive use of the watershed's soil, water, and related resources in such a way that the residents of the watershed can enjoy:

Quality in the Natural Resource Base for Sustained Use.

Quality in the Environment to Provide Attractive, Convenient, and Satisfying Places to Live, Work, and Play.

Quality in the Standard of Living Based on Community Improvement and Adequate Income.

The Sponsors selected and/or modified measures that will help to achieve these objectives and also to minimize adverse impacts in carrying out the project objective.

PLANNED PROJECT 1/

Land Treatment - Land treatment measures are considered basic in formulating this watershed project and are essential to its successful functioning. The project provides for technical assistance for accelerating the establishment of land treatment measures throughout the 43,872-acre watershed area. At the end of the three-year installation period, about 23,270 acres of land will have received adequate treatment as measured by Soil Conservation Service standards. This is in addition to the lands of the watershed already adequately treated and the additional lands that will be treated after the end of the project installation period. The 23,270 acres to be adequately treated during the installation period will consist of about 20,450 acres of cropland and 1,820 acres of pastureland. Other areas will receive partial treatment.

Land treatment measures planned for the cropland consist of conservation cropping systems, crop residue management, drainage field ditches, drainage mains and laterals, drainage land grading, irrigation land grading, land smoothing, row arrangements, spoil bank spreading, wells, and grade stabilization structures. The measures planned for pastures and hay lands consist of pasture planting, pasture management, drainage field ditches, drainage mains and laterals, and farm ponds. Forest land treatment measures will be carried out through improved harvesting methods undergoing cooperative forest management programs. Wildlife measures include wildlife upland habitat management and wildlife wetland habitat management.

Conservation cropping systems are the growing of crops in combination with needed cultural and management measures and include crop rotations. Crop residue management (crop residue use) is the use of plant residues to protect cultivated fields during critical erosion periods. A drainage field ditch is a graded ditch for collecting excess water within a field. A drainage main or lateral is an open drainage ditch constructed to a designed size and grade. Drainage land grading is the reshaping of the surface of the land to be drained by grading to planned grades. Irrigation land grading or irrigation land leveling is the reshaping of the surface of the land to be irrigated to planned grades. Land smoothing is the removal of irregularities on the land surface by use of special

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1/ All information and data except as otherwise noted by reference to source, were collected during watershed planning investigations by the Soil Conservation Service and Forest Service, U. S. Department of Agriculture.

equipment. Row arrangement is the arrangement of crop rows in such a way as to facilitate and control row drainage. Wells include the construction or improvement of wells to provide water for irrigation, livestock, wildlife, or recreation. Grade stabilization structures are structures to stabilize grade or to control head cutting in natural or artificial channels.

Pasture planting consists of establishing and reestablishing long term stands of adapted species of perennial, biennial, or reseeding forage plants. Pasture management includes the proper treatment and use of pastureland or hay land. Ponds are impoundments made by constructing a dam or embankment or by excavating a pit or dugout.

Structural Measures

Multiple Purpose Channels - Planned structural measures consist of 50.1 miles of multi-purpose channel work to provide additional capacity for drainage and disposal of runoff from the watershed. The channels were sized to meet the capacity requirements computed by the formula Q = 40 M 5/6, where Q equals runoff in cubic feet per second, and M equals contributing drainage in square miles. However, the storage provided by Lake Bolivar and a sump or low area in the vicinity of station 340+00 along Main Deer Creek, combined with the fact of Deer Creek becoming a perched stream at the lower end of the watershed, limits the quantity of flow moving through the channel to somewhat less than design flow.

Channel work will consist of excavation, clearing, shaping, disposal of spoil, installation of pipe overfall grade control structures, and water level control structures. A weir will be located at approximately station 50+00. The purpose of this structure will be to allow floodwater to move out of Lake Bolivar during periods of high flood stage and to maintain a constant water level in the lake during periods of low stage.

The channel work will serve both flood prevention and drainage purposes. The rate of runoff provided by the design criterion Q = 40 M 5/6 was used as the basic design of all channel improvements. This design capacity will provide for the removal of 1.50 inches of runoff in 24 hours from one square mile drainage area. A channel designed for this capacity will reduce existing floodwater damage to crops and pastures by 60 percent.

The formula Q = 40 M 5/6 was selected as the basis for channel sizing computation because of the agreement between the Crops of Engineers and the Soil Conservation Service that the upstream channel capacities would be

limited to the capacity capability of the downstream channels to accept the upstream flows without exceeding the design flow lines as the flow moves downstream. Channels with sizing as computed by this formula and resultant flows will provide an adequate level of protection for sustained agricultural use.

Materials through which the channels are to be constructed are medium to highly plastic clays (CL+CH) with isolated lenses of silty sands (SM) and clayey sands (SC). Channels B-1, 5, 7, and 8 are man-made channels. All others are natural channels. Some maintenance has been done in the past but no coordinated program has been carried out.

Planned channel work varies from channel clearing and shaping to channel enlargement (See project map). The 50.1 miles of channel work consists of 13.66 miles of channel clearing and shaping (channel work type-class III), and about 36.49 miles of channel enlargement (channel work type-class II).

Planned channel work on Main Deer Creek below the weir structure at Scott (See project map) is as follows: From station 50+00 to station 206+50, channel enlargement is planned. Some large trees outside the flow area will be left. Channel clearing is planned from station 206+50 to station 266+00. The present channel widens out in this reach and further enlargement is not necessary. Large cypress trees growing near the channel banks will be preserved. Fallen trees, sediment bars, and other debris will be removed from the flow area. Channel enlargement is planned from station 266+00 to station 560+00. Some large trees will be left along the channel banks. The width of the proposed channel requires that construction be performed from both sides of the channel. Channel clearing and shaping are planned from station 560+00 to station 662+00.

County road bridges or culverts at stations 94+00, 175+00, 295+00, 335+50, 385+50, and Mississippi State Highway 450 culverts at station 206+50 will be replaced at local expense.

County road bridges at station 440+50 and station 560+50 will be reinforced. One pipe line at station 459+40 will be lowered.

Channel activities on East Branch Deer Creek, a tributary, are as follows: Channel enlargement is planned from station 50+00 to station 408+00. Much of this reach has been cleared in the past. Channel clearing of woody vegetation, sediment bars, and other debris is planned from station 408+00 to station 580+00. The construction of this channel is to be done from one side. Large trees outside the flow area will be left intact. Saw Grass Lake will not be affected by this channel as flow from this lake is controlled by a water level control structure.

New bridges will be required at station 282+50 and 354+00.

Channel activities on Williams Bayou, in the southern part of the watershed are as follows: Channel enlargement is planned from station 50+00

to station 250+00. Many of the large cypress and other larger trees growing outside the flow area will be left. Channel clearing and shaping will be done from station 250+00 to station 637+00. Groves of pecan trees along the streambank will be preserved by construction from one side. Many of the large cypress trees outside the flow area will also be left. New culverts will be installed at stations 61+00, 124+00, 157+00, 190+00, 287+00, and 377+00. The spoil in the vicinity of St. Joseph Church and cemetery will be placed on the south side of the bayou.

Activities on Channel No. 1, located in the north central part of the watershed are as follows: Channel enlargement is planned for its entire length from station 47+00 to station 452+00. Channel construction will be performed from one side. Excavation spoil from station 379+00 approximately to station 450+00 will be placed on the north side to form a levee. Water level control gates installed through the levee will allow water to be maintained in a wetland area to preserve present wildlife habitat.

The Mississippi Highway No. 1 bridge at station 116+00 and county road bridges at station 200+00 and station 379+00 will be replaced. The railroad bridge at station 116+00 will be reinforced. The cost of reinforcement is included in estimated costs (see table).

Channel activities on Channel B-1 in the extreme northeastern part of the watershed consist of channel enlargement which is planned for the entire length of this channel from station 50+00 to station 84+00.

One culvert underlying a county road will be lengthened and lowered.

Channel C-1, also in the northeastern part of the watershed, follows an existing channel for most of its length from station 86+00 to station 143+25. Channel enlargement is planned for most of this distance with a short section of new channel. Construction will be done from one side.

Activities on Channel No. 2, also in the northeastern part of the watershed, include channel enlargement for the entire length from station 50+00 to station 224+50. Construction will be done from one side. Large trees outside the flow area will be preserved. The culvert capacity under a county road will be increased at station 89+00.

Channel activities on Channel No. 3, located in the northeast part of the watershed, will include channel enlargement for its entire length from station 50+00 to station 127+00. Construction will be performed from one side of the channel. One county road culvert at station 95+00 will be replaced.

Channel No. 5, in the southern part of the watershed, will be enlarged for its entire length from station 50+00 to station 160+00. Channel construction will be accomplished from one side. Two water level control structures are planned. These will allow the preservation of present wildlife habitat in adjacent wetland areas.

New bridges will be constructed at stations 56+00, 73+50, 89+00, 105+00, 121+00, and 160+50.

Channel No. 7, located in the southern part of the watershed, will be enlarged its entire length from station 50+00 to station 82+00. Construction work will be accomplished from one side of the channel. The spoil in the vicinity of St. Joseph will be placed on the east side.

Channel No. 8, also in the southern part of the watershed, will be enlarged from station 50+00 to station 79+00. A new culvert will be installed at station 74+50. Channel construction will be performed from one side of the channel.

Over excavation for sediment traps is planned in the following channels: Main Deer Creek, East Branch, Williams Bayou, and Channel Nos. 1 and 5. Earth-blocks will be spaced out to hold water and to reduce vegetation in the channel bottoms.

Adverse effects to the stream fisheries and wildlife resources have been carefully considered in planning channel work features. Planned channel measures have been kept to an absolute minimum to achieve floodwater control objectives. All areas to be cleared will be revegetated as soon as reasonably possible.

Fifty wood duck nesting boxes will be constructed in the confines of Saw Grass Lake as mitigation for drainage of approximately 89 acres of Type 7 wetlands which lie adjacent to channels 2 and 3.

Temporary and permanent vegetation is planned for maintenance roads, disposal areas, and all channel banks where the natural vegetation and/or banks are disturbed during construction. Construction will be scheduled to provide the maximum length growing season practical to allow re-establishment of the vegetation. Vegetative measures will be included in construction contracts.

There are no relocations and/or displacements resulting from the acquisition of land rights for the structural measures included in this watershed.

Installation Procedures - Structural Measures - Soil erosion and water, air and noise pollution will be minimized by following SCS Engineering Memorandum-66 and applicable state guidelines to reduce erosion and pollution. Measures which will be followed to reduce erosion and sedimentation are: (1) limiting the exposure of erodible soils to the shortest time reasonably possible; (2) use of temporary vegetation where the exposure of erodible soils will be excessive; (3) retardation of runoff by mechanical means where necessary; and (4) trapping sediment in sediment traps. Measures which will be used to reduce water, air and noise pollution are: (1) application of water on haul roads and construction

areas for control of dust during construction; (2) use of temporary bridges and/or culverts on running streams; (3) careful handling of fuel, oils, and lubricants to reduce spillage; (4) maintenance of construction equipment including engines and exhaust systems; (5) regulation of burning at construction sites to proper burning conditions; and (6) location of access and haul roads as far as possible from residential homes.

The Federal Register, National Register of Historic Places, dated February 4, 1975, as corrected April 1, 1975, was consulted and no registered properties within the area were found.

A professional archaeologist employed by the Mississippi Department of Archives and History has made an archaeological and historical survey of the watershed. This survey indicated the existence of 16 archaeological or historical sites within and near the watershed area. These sites are recorded as 22-Bo-540, 568, 569, 575, 576, 577, 578, 579, 580, 581, 582, and 583, and 22-Ws-535, 576, 577 and 579. An additional site, the Winterville site (22-Ws-500) is located a few miles to the southwest of the watershed and is a part of the Mississippi State Park System and is state-owned. The report states that most of the sites were single dwelling units or hunting camps of the Baytown period. The Metcalfe site (22-Ws-579) is considered by some as a rather important occupation area. However, it is outside the watershed boundary by quite a distance.

According to the State Historic Preservation Officer, as of December 15, 1975, there are no sites in that watershed listed in the National Register of Historic Places or the most recent monthly supplement.

The National Register criteria was used on all recorded sites within the watershed area in evaluating and determining the eligibility of properties for listing in the National Register of Historic Places.

Land Use Changes - Studies indicate that land changes taking place because of the installation of project measures will be as follows. Total cropland within the watershed will decrease slightly. Lands allocated to grasslands will increase by approximately 16 percent; forestland will decrease by 6 percent; other lands will be increased by approximately 31 percent; and miscellaneous lands will remain as they were before the project.

Cropland decreases will result from use of land for structural measures and rights-of-way and inefficient commitment of production factors. The other lands are mostly idle and land that is available for agricultural use and wildlife uses.

The following table shows land use for the watershed both at the present and in the future.

Land Use	Present Acres	Projected Acres
Cropland	34,441	34,082
Grassland	1,563	1,820
Forestland	5,201	4,860
Other Land	1,417	1,860
Miscellaneous	1,250	1,250
Total	43,872	43,872

Operation and Maintenance

Land treatment measures on private land will be operated and maintained by landowners and operators under cooperative agreements with the Soil Conservation District of their respective county. The operation and maintenance of these measures will be the financial responsibility of the individual operators and landowners. Land treatment measures on public lands are to be operated and maintained by the land administering agency in charge of these lands or by individual farmers or operators having leases on these lands.

The Water Management District will assume the responsibility to operate and maintain the multiple-purpose channels including the water level control devices for the preservation of wetlands. Operation and maintenance funds will be secured through assessments as provided in Mississippi Senate Bill 1220, extraordinary session 1955. The estimated annual cost for operation and maintenance of the multi-purpose channels is $12,600. This cost includes $2,600 annual replacement cost for the pipe overfall grade control structures due to their expected life of 30 years.

Joint inspections will be made annually by the sponsors and the Soil Conservation Service official responsible for operation and maintenance inspections. They will also make inspections after unusually severe floods and after the occurrences of any other unusual conditions that might adversely affect the structural measures. These inspections will continue for a period of three years following construction. Inspections after the third year will be made annually by the sponsors. They will prepare a report and send a copy to the Soil Conservation Service official responsible for operation and maintenance inspections and follow-up. Where needed, the Soil Conservation Service official may continue to provide assistance after the third year as determined by the State Conservationist.

The maintenance of the flood prevention channels will be accomplished by the use of sprays approved by the U. S. Environmental Protection

Agency for use adjacent to aquatic areas and/or labor and equipment to control noxious weeds and unwanted vegetation. Care will be taken in the application of sprays to prevent drift to adjoining land areas. The maintenance of streambanks will promote the growth of desirable vegetation for streambank erosion control and wildlife habitat. Where sprays are used for maintenance, their use will conform to applicable laws and/or rules and regulations. Additional maintenance will include the removal of drifts, debris, and/or sediment bars as necessary.

Travelways for maintenance of structures will be constructed as a part of the construction contract. These travelways will be adequate for movement of operation and maintenance equipment required for maintenance of the channels. They will be maintained as a part of the channel system.

Detailed plans for operation and maintenance will be contained in the Watershed Protection Operation and Maintenance Agreement, which will be executed prior to issuing invitations to bid on construction work. The state Operations and Maintenance Handbook will be used as a guide in preparing the watershed Protection Operation and Maintenance Agreement. The Operation and Maintenance Agreement will include specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance.

Project Costs - The project costs are shown in the following table:

Deer Creek Watershed
Cost Data

Item	Cost (Dollars)		
	PL 566	Other	Total
Land Treatment	37,500	660,100	697,600
Structural Measures	1,696,500	763,000	2,459,500
Construction	(1,284,800)	(239,500)	(1,524,300)
Total	1,734,000	1,423,100	3,157,100

WATERSHED RESOURCES - ENVIRONMENTAL SETTING

Physical Data

Location and Size - Deer Creek Watershed is composed of 43,872 acres and is located in northwestern Mississippi. The watershed has 40,630 acres, 92.6 percent in the southwestern part of Bolivar County, and 3,242 acres, 7.4 percent in northwestern Washington County. Towns and/or communities in or adjacent to the watershed are Eutaw, Benoit, Bolivar, Grapeland, Hannah, Lake Vista, Lamont, Scott, Stringtown, Priscilla, and Winterville. The city of Greenville is situated approximately six miles south of the watershed. Cleveland is 20 miles to the northeast and Greenwood 45 miles to the east. The population of the watershed is estimated to be about 2,100 people.1/ All of these are classed as rural population.

The watershed is located approximately in the south central part of the Lower Mississippi Water Resource Region and in the west central portion of the Yazoo River Basin Sub-region.

The Lower Mississippi Region, an area of abundant natural resources, lies chiefly in the Gulf Coastal Plain and is roughly bisected by the Mississippi River.2/ The region is composed of 102,400 square miles of land and water. It extends from the confluence of the Ohio and Mississippi Rivers to the Gulf of Mexico. The climate of the entire Lower Mississippi Region is classified basically as humid subtropical with abundant precipitation. Winters are usually relatively mild and summers are hot.

The Yazoo River Basin Sub-region consists of the entire drainage area of the Yazoo River and its tributaries, of which Deer Creek is a part. It lies entirely within the state of Mississippi and is composed of 13,355 square miles or 13 percent of the total area of the Lower Mississippi Region.

Precipitation and temperature patterns are similar to those of the Region as a whole. Topography, however, within the sub-region varies greatly. The delta portions of the basin are composed of low, relatively flat lands in the Alluvial valley of the Mississippi River. Elevations in this area range from about 90 feet above sea level near Vicksburg, Mississippi, to about 200 feet near Tunica, Mississippi. An abrupt bluff hill line rises on the east side of the delta with sudden increase in elevation of more than 100 feet at some locations. Areas to the east of this bluff line consist of rolling to rugged hill land with valleys ranging from 0.5 to 2 miles in width. Elevations in the hills reach 640 feet near New Albany, Mississippi, and range from 300 to 500 feet throughout the hill area.

Because of its location within the delta part of the region and sub-region, the conditions and characteristics of the watershed are similar to the

1/ U. S. Department of Commerce, County and City Data Book, Bureau of the Census, 1972.

2/ Lower Mississippi Region Comprehensive Study, Vol. I, Appendix C, December 1973.

conditions and characteristics in those areas. Topography is relatively flat. Winters are mild and summers are hot and humid. Rainfall distribution patterns as a rule are good for the growth of most field crops.

Water Resource Problem Areas - Deer Creek, being a delta watershed, has less than 5,000 acres of lands with erosion hazard. Sediment and erosion damages within the watershed are moderate. Sediment produced by sheet erosion has caused some loss of capacity in channels and bayous serving as outlets but this, however, has occurred over a long period of time and is not considered a serious problem.

Flooding and lack of adequate drainage are the major watershed problems. Flooding occurs because of relatively flat topography and inadequate channel capacities. The drainage problem results partially by lack of outlets and partially by flat, low-lying fine textured soils. There are about 27,580 acres of the watershed within which both flooding and drainage problems exist (see solid area of project map). About 16,290 acres have flooding problems only within the area (see crosshatched area on project map). The flooding only and/or flooding and drainage are so intermixed and intermingled within the entire watershed area so that they could not be individually separated on the map. The flat, low-lying, fine textured soils make up a large part of this area. Normal rainfall produces excess water which keeps the soil in such a condition that normal tillage cannot be carried out properly and crop yields are greatly reduced. Sediment caused by erosion has caused some loss of capacity in channels and bayous serving as outlets.

Geology - The watershed lies entirely within the Mississippi Alluvial Plain or "Delta" physiographic region. Geologically, the soils of this area are young. Some areas have received fresh sediments during recent geologic periods. Meanders, oxbow lakes, and crescent-shaped swamps are found within the area.

Land - The watershed lies entirely within the Southern Mississippi Valley Alluvium Land Resource Area. Land within the watershed is relatively flat, very fertile, and constitutes a highly developed farming region. The soils in addition to being nearly level, have many low lying narrow depressions running in different directions. There are also landlocked pan type depressions with clay soils scattered throughout. Such interlaced and landlocked conditions make it impossible for the soils of this group to dry uniformly after heavy rains.

Important differences among the soils of the watershed are related to differences in parent material, age, drainage, and soil capability. All of the soils were derived from alluvium, most of which was deposited by the Mississippi River. Most soils of the watershed have clay, silty clay, silty clay loam, or silt loam textures. A few have textures of very fine sandy loam, fine sandy loam, sandy loam, or loamy sand. Slopes of from nearly level to level predominate.

The soil capability grouping is an arrangement of soils to show relative suitability for crops, grazing, forestry, or wildlife. Soils that are nearly level, well drained, free from overflow, fairly fertile, and not otherwise limited are placed in class I. They are widely adaptable.

The farmer can use his class I soils for crops without special practices and can choose one of several cropping systems. If he wishes he may use the soil for pasture or for some other purpose. Soils are placed in class II if they are a little less widely adaptable and thus more limited than those in class I. A gently sloping soil must be farmed in such a manner as to control erosion. Other soils may be in class II because they are too droughtly, too wet, too sloping, or too shallow to be in class I.1/ Class III contains soils that are suitable for regular cropping but that have narrower adaptations for use or more stringent management requirements than those in class II. Soils that are even more limited and that have narrower crop adaptations than those of class III, but are still useable for tillage part of the time or with special precautions are placed in class IV.

The watershed can be divided into three major soil groupings or soil associations. The westernmost portion of the watershed, along the eastern edge of the Mississippi levee, is composed of soils of the Commerce - Robinsonville - Crevasse soil association. Principal soils of this grouping are Commerce, Robinsonville, Crevasse, and Mhoon, all of which are on recent natural levees. The less extensive Dowling and Souva soils, are in depressions or the channels of former streams. In general, the relief is nearly level, but some small areas are gently sloping. The soils are neutral to alkaline. All of the principal soils are easily worked. The principal soils are in capability classes I, II, and IV. They are the most productive in the watershed and much of this association is used for row crops. The principal crops are cotton, soybeans, and corn. A small acreage is used for small grains and pasture. These soils are protected from overflow by the Mississippi levee system.

Soils of the Forestdale - Dundee - Bosket association make up much of the northern, eastern, and central parts of the watershed. This association consists of soils developed on old natural levees and in depressions and channels of former streams. Principal soils are Forestdale, Dundee, Dubbs, Bosket, Beulah, and Clack. All are found on old natural levees. Dowling and Souva soils occupy depressions or channels of former streams and also occur as narrow strips within large areas on the old natural levees.

In general the relief is nearly level but a few narrow strips have slopes which range from 7 to 10 percent. The soils are strongly acid to slightly acid. Their drainage range from poor to excessive. The soils are in capability classes I, II, III, and IV. They are among the most productive soils of the watershed. Cotton is the principal crop. Some parts of the association are used for soybeans, corn, small grains, hay, and pasture. Only a small part is in forest.

Interspersed in the central and southern parts of the watershed are the soils of the Dowling - Alligator - Sharkey soil association. Principal soils are the Alligator, Sharkey, and Tunica on slack water flats and the Dowling which occurs in depressions or former stream channels. The relief is nearly level to gently sloping on most of the association. Some areas are level, however, and occasional narrow strips have strong slopes. Soil

1/ Soil Survey, Bolivar County, Mississippi, Series 1951, No. 5.

reactions range from strongly acid to neutral. The Alligator soils are most acid. The soils are difficult to work. Most of them have fine textured clayey surface soils and subsoils. They are mostly in capability classes III and IV but some are in capability class II. Most of the association are used for crops. Cotton is grown on a majority of the soils. Because cotton yields have been decreasing due to increasing wetness, some of the acreage formerly used for cotton is now used for soybeans, rice, hay, and pasture.

Climate - The climate of the watershed area is the humid sub-tropical type. Summers are hot. Winters are mild. In the winter the temperature seldom drops below zero degrees or climbs above 70° F. Summer temperatures seldom rise above 100° F or fall below 60 degrees. The average yearly temperature is 63.8 degrees. The growing season for the watershed amounts to approximately 220 days as the average frost free period extends from March 27 to November 2.

Rainfall is fairly well distributed throughout the year. Normally, during the summer, there are no prolonged wet or dry periods. There are, however, occasional dry periods that last long enough in summer to injure crops and pasture. At times wet periods last long enough to injure crops, particularly on the poorly drained soils. The heaviest precipitation comes in winter and spring and local flooding is not unusual. The annual rainfall for the watershed area, based on records of the U. S. Weather Bureau at Scott, Mississippi, is 48.36 inches. The wettest month is December with 5.65 inches of rainfall and the driest month is September with 2.92 inches.

Mineral Resources and Ground Water Resources - Water for domestic use is supplied from drilled wells and dug wells. Water for livestock use is supplied by drilled wells but some pond or creek water is used to supplement these wells. Abundant ground water resources underlie the Yazoo River Basin, of which the watershed is a part.1/

Data indicates that water is available to the watershed area from five different fresh water aquifers. These include the Mississippi River Alluvium, the Cockfield Formation, the Sparta Sand, the Basic City Shale Member, and the Meridian-Upper Wilcox aquifer. Much of the ground water being used in the watershed is being drawn from the Mississippi alluvial aquifer which underlies the entire Yazoo River Basin area. This aquifer is composed of sands and gravels and averages about 80 feet in thickness. It is replenished principally by infiltration of precipitation from permeable upper layers. Water from this aquifer is moderately mineralized and hard, and generally contains up to 16 milligrams per liter of iron in solution.2/ It is used for irrigation, mainly for rice, and where treated,

1/ Lower Mississippi Region Comprehensive Study, December 1973.
2/ Water for Industry and Agriculture in Washington County, Mississippi, 1971.

can be used for municipal uses. A study of data from approximately 20 deep wells in the general area of the watershed indicates that water is being used from depths of over 1,800 feet. The majority of the deep wells, however, draw water from a depth of from 400 to 800 feet.

Generally, there is sufficient moisture during the growing season for the production of crops. There are, however, occasional dry periods that last long enough in summer and fall to injure crops and pastures.

There are no gas or oil wells within the watershed, however, there are several gas pipelines which cross the watershed in different directions.

Land Use - The present land use in the watershed is 79 percent cropland, 3 percent grassland and perennials, 12 percent forest land, and 6 percent other land. Cropland areas are scattered throughout the watershed. Forest lands are concentrated mainly in the northern and westernmost parts of the watershed and are located mostly adjacent to depressions and stream channels. Sizable acreages of forest land are located near both ends of Lake Bolivar, a 662 acre oxbow lake, located in the upper left hand portion of the watershed near the Mississippi River. Approximately 20,368 acres of land are subject to flooding annually in the watershed. Land uses of these acreages include cropland, pastureland, and municipal uses (roads and bridges).

The land within the watershed is divided between private and public ownership. Privately owned lands constitute 41,787 acres or 95.2 percent of the watershed. Public lands make up the remaining 2,085 acres (4.8 percent). These are Sixteenth section school lands which are administered by their respective County Board of Supervisors. There are no Federal lands within the watershed.

The average size farm in the watershed is 363 acres.

Surface Water Resources - Surface water resources within the watershed consist of both natural and man-made channels which make up Deer Creek and its tributary streams, Lake Bolivar, Saw Grass Lake, and small ponded areas both natural and man-made.

Lake Bolivar is located in the northwestern part of the watershed near the town of Scott. It is five miles long and contains 662 acres of surface water.1/ It is, like many of the larger lakes in the Delta region, an oxbow lake, the remains of an old Mississippi River channel. The lake is classified for use as fish and wildlife. This means that its waters are intended for fishing and for propagation of fish, aquatic life, and wildlife.2/

1/ State Wide Lake And Stream Survey, Mississippi Game and Fish Commission, 1969.

2/ Water Quality Criteria for Interstate and Intrastate Waters, Air and Water Pollution Control Commission, State of Mississippi, April 24, 1973.

Saw Grass Lake is a 175-acre wooded wetland area located in the eastern part of the watershed. It is an important waterfowl and wildlife area and is used for waterfowl management purposes.

The stream system of the watershed is made up by Williams Bayou and Deer Creek and its tributaries. The system contains both natural and man-made channels. Deer Creek, the major stream of the watershed, is made up by East Branch and Straight Bayou along with numerous smaller tributaries. Deer Creek proper forms as an outlet of Lake Bolivar. The creek flows from its source southeasterly to the southern boundary of the watershed where it is joined by Williams Bayou and by East Branch. East Branch and its tributary, Straight Bayou begin in the northeast part of the watershed near an old Mississippi River channel and flow southward until they join in the east central part of the watershed, then continue to the south until joining with Deer Creek proper at the southern boundary of the watershed. Williams Bayou, which forms the southwestern and southern boundary of the watershed begins in the western part of the watershed near the Mississippi River levee system. It flows in a southwesterly direction to its confluence with Deer Creek proper in the southeastern part of the watershed.

Streams of the watershed, for the most part, are classed as intermittent because they flow during parts of the year, but have little or no flow during other parts. Laterals and field ditches in the upper reaches of the larger streams and their tributaries are classed as ephemeral because they flow only during periods of surface runoff and are dry otherwise.

The table (following page) illustrates chemical and physical stream data for specific locations and conditions.

Wetlands

There are about 89 acres of Type 7 wetlands along proposed channels 2 and 3 in the northeastern portion of the watershed and about 435 acres of Type 7 wetlands along proposed channels 1 and 5 in the central and southern portions of the watershed.

Economic Data

The watershed area is of an agricultural nature with farming and related industries being of vital importance to its economy. Cotton, soybeans, and rice are the principal sources of cash farm income. Cotton production decreased 47 percent during the 20-year period from 1949 to 1969 and increased 56 percent from 1969 to 1972. Soybean acreages have been on the increase. Acreage harvested for beans increased about seven times during the 1949 to 1970 period. Acreage has leveled off since 1970 varying with planting season weather conditions. Rice acreage in 1969 was 80 percent of what it was in 1954. These crop acreages and percentages are for Bolivar and Washington Counties but are representative of the Deer Creek Watershed. The number of livestock reached a peak in 1954 and was reduced consistently until 1969 and has leveled off since that time.

STREAM DATA--CHEMICAL AND PHYSICAL ANALYSES

Deer Creek Watershed, Mississippi

Parameters	Interflow				24 Hr.			Storm Runoff	
	Sample Stations				Sample Stations			Sample Stations	
	1	2	3	4	1	3	4	1	3
	Range of Values								
Dissolved Oxygen, mg/l	4.4 - 5.2	5.4 - 5.5	5.5 - 6.0	5.1 - 5.3	4.4 - 6.2	3.9 - 5.9	3.7 - 5.5	4.0 - 4.6	4.4 - 4.7
Flow, cfs	60 - 70	60 - 70	55 - 65	35 - 40	60	55	35	60 - 95	60 - 95
Nitrate, mg/l	0.05	0.06 - 0.11	0.08	0.08 - 0.15	-	-	-	0.09 - 0.13	0.09 - 0.14
pH	6.1 - 6.4	6.4	6.4	6.3 - 6.5	6.1 - 6.6	6.3 - 6.8	6.1 - 6.6	6.3 - 6.7	6.3 - 6.7
Pesticides									
Methyl Parathion, ppb	0	0	0	0	-	-	-	0	0
Toxaphene, ppb	0	1.8 - 3.1	2.4 - 2.5	1.5 - 2.4	-	-	-	0.96 - 2.0	0.66 - 2.01
Total Phosphorus, mg/l	0.08 - 0.16	0.04 - 0.20	0.03 - 0.26	0.07- 0.21	-	-	-	0.17 - 0.28	0.18 - 0.29
Ortho Phosphorus, mg/l					-	-	-		
Total Solids, mg/l	166 - 177	172 - 173	108 - 160	96 - 163	-	-	-	323 - 809	247 - 454
Total Suspended Solids, mg/l	30 - 46	27 - 46	28 - 31	14 - 50	-	-	-	12 - 38	14 - 48
Total Dissolved Solids, mg/l	120 - 147	126 - 146	77 - 132	46 - 149	-	-	-	306 - 786	215 - 406
Specific Conductance, Micromhas/cm	240 - 252	228 - 250	225 - 250	192 - 205	-	-	-	470 - 552	439 - 470
Temperature									
Air, °C	31 - 33	32 - 34	32 - 34	32 - 35	19 - 32	19 - 32	19 - 32	28 - 31	28 - 31
Water, °C	25 - 28	27 - 30	27 - 30	28 - 32	24 - 27	25 - 27	25 - 29	26 - 27	26 - 28
Turbidity JTU	< 25	< 25	< 25	< 25	-	-	-	< 25 - 45	< 25 - 45

The average annual gross income from the sale of farm products in Bolivar and Washington Counties amounts to $28,240 per commercial farm, of which 97 percent is from crops and 3 percent is from livestock. In 1969 approximately 51 percent of the farms of this area received less than $5,000 gross income from the sale of farm products. With the cost of production deducted from these sales, net return would be much less. Approximately 28 percent of the farm operators worked off farm because of low farm income, with about 15 percent working off the farm 100 days or more per year.

Low income-producing family type farms are scattered throughout the watershed. It is estimated that less than 50 percent of the agricultural land in the benefited area is devoted to farms using 1 1/2 man years or more of hired labor.

The flood plain lands have an estimated value of $400 per acre and the non-flood plain land an estimated value of about $500 per acre.

Bolivar and Washington Counties, of which the watershed is a part, are areas that have been designated as being economically depressed. They are designated as area redevelopment act counties in Mississippi. Project Installation will include many of the objectives of the Overall Economic Development Plan and will promote the Rural Area Development efforts in these counties.

Local and county roads cross the watershed in various directions. Mississippi Highway No. 1 and a branch of the Illinois Central Gulf Railroad cross the watershed from north to south. Mississippi Highway No. 450 crosses the watershed from west to east and Mississippi Highway No. 448 forms the northeastern boundary of the watershed. The county and state roads along with the railroad provide easy access to nearby business areas and markets.

Fish and Wildlife Resources

Wildlife habitat resources within the watershed are varied and though limited in quantity are of excellent quality and distribution. Deer, squirrel, rabbit, quail, and doves are found in abundance in the watershed. Some turkey are found in the forest lands near the Mississippi River levee system. Waterfowl populations are high during the winter months when they use bayous, wetlands, and farmlands as feeding and resting areas.

It is a common practice in the Mississippi Delta to dam the swales that are present in cropped areas with small earth fills and culverts. This practice enables landowners to flood these depressions, which contain waste grains, to a depth of one to two feet. These areas provide attractive feeding areas for the abundant wintering waterfowl population. Rice and soybean fields are often managed in this manner with the waste grain often providing as much as 15 percent of the total amount of harvested grain, which is high quality waterfowl food for waterfowl utilization.

Although not as common, some waterfowl foods such as Japanese millet, are planted in swales which are too wet to crop, or in the beds of old lakes or sloughs. Winter rains and backwater from the larger watercourses generally flood these areas and make the planted foods available for use by waterfowl.

Wood ducks, the only native duck in the watershed area, use cypress and other trees that have suitable hollows for nesting sites.

Saw Grass Lake, a large wooded wetland area in the eastern portion of the watershed is an important waterfowl and wildlife area which is used for waterfowl management purposes. Extensive river front forestlands near the western edge of the watershed, though not in the watershed, contain large populations of wildlife and influence the game population within the watershed.

Fur bearing animals known to be present in the watershed area include beaver, muskrat, and mink. Alligators have been known to have lived in the area in times past. None are known to exist in the watershed at present.

Fishery resources consist of Lake Bolivar, a 662-acre oxbow lake, Saw Grass Lake, and assorted bayous and creeks. Lake Bolivar has adequate game fish population and both it and Saw Grass Lake are used for fishing by local residents. Fishery resources in the creeks, sloughs, brakes, and bayous are of low value. Water quality is fair to poor and water levels fluctuate drastically.

The stream fishery is limited within the watershed due to several factors that presently contribute to ecological problems within the watershed's streams. A fish population sample conducted on September 25, 1974, within the main channel of Deer Creek approximately one mile east of Scott revealed that this section of stream yielded a relatively large fish-standing crop (490.73 lbs./acre). However, the majority of the sample consisted primarily of small and relatively undesirable species. Although one sample at a selected point within the watershed is hardly enough evidence to remark conclusively about the stream fishery resource watershed-wide, the presence of common limiting factors throughout the watershed would reduce the possibility of an adequate stream fishery occurring.

The lack of flow within most of the watershed's streams has a pronounced effect upon the stream fisheries. Streams within the watershed are classed as intermittent and ephemeral. Seasonal drying during summer months frequently limits their water to small shallow holes which are subject to summer stagnation and oxygen depletion. As a result, only those fish species which are capable of tolerating low oxygen concentrations occur within these streams, and even they are subject to other limiting factors which may reduce their numbers or eliminate their presence. The streams with moderate flow during certain parts of the year, for example the sample location, lack a desirable fishery resource due to factors apparently unrelated to flow--in this case, poor water quality, high pesticide content, and lack of habitat diversity.

Previous stream alteration is another aspect contributing to the poor fishery resource. Most of the watershed's streams have had some previous channel modification, and though in certain instances the changes have been made long enough ago to permit complete revegetation of the channel banks and partial retrogression of the stream to a meandering course, the adverse effects of channelization upon the stream fisheries are still apparent.

Probably the most pronounced factor limiting the fishery resource is the widespread use of pesticides within the watershed. Most of the watershed is agricultural with the majority of the land use being dedicated to row crops which involve the use of pesticides in their cultural requirements. There is evidence of pesticide concentrations within many of the faunal inhabitants of the watershed and many species, especially those occupying the higher trophic levels of the food chain, have become eliminated due to intolerance of high pesticide accumulations formed through the process of biological magnification.

The existing fish population appears to possess significant intrinsic problems which reduced the quantity and quality of the present sport fishery. Only one specimen of carnivorous fish species, the spotted gar (Lepisosteus oculatus), was recovered in the population sample. Without the presence of predator fish to prey on the forage species, the present population has become extremely "out of balance." The population sample reflects this phenomenon very vividly in that the predominance of the forage species has caused stunting of all members of the lower trophic levels and provides the reason for the large number of small fish within the sample. No species of game fish were recovered of harvestable size. No predator species of game fish were recovered at all. Only a total of 10 species of fish were present. Previous stream channelization and pesticide accumulation within the stream inhabitants have contributed heavily to the "unbalanced population."

The large standing crop that seems to be present is indicative of the inherent high productivity of this watershed. Although channelization and pesticide use has reduced the fishery resource to a near worthless state, the basis for a good fishery potential is still present.

Results of the Deer Creek fish population sampling is listed on the following page.

The Mississippi Air and Water Pollution Control Commission indicated that the town of Benoit has a 3-cell lagoon for sewerage treatment with the lagoon discharging into Burrows Creek which is outside the watershed. They also indicated that the communities of Eutaw, Scott, and Priscilla have no sewerage facilities. They advise that there are no waste discharges in the Deer Creek Watershed to their knowledge.

Deer Creek Fish Population Sample

Location: Approximately 1 mi. east of Scott, Mississippi
Date: September 25, 1974

Approximately 100 yards of stream
Stream condition: Good flow, water murky, stream previously channelized

Noxfish (5% rotenone) - 3.5 pints
Potassium permanganate - 7 pounds

Total sample weight - 60.85 pounds
Approximate standing crop - 490.73 lbs./acre

Species	Common name	Number	Length (in)	Weight (lb)
Lepisosteus oculatus	Spotted gar	1	18	1.15
Dorosoma cepedianum	Gizzard shad	6	7	.75
		3	4	.15
		3	3	.10
		8	2	.05
Notemigonus chrysoleucas	Golden shiner	3060	2-8	38.25
Noturus gyrinus	Tadpole madtom	54	2	.50
Ictalurus natalis	Yellow bullhead	2	8	.50
		2	7	.25
		4	5	.25
		4	3	.15
Gambusia affinis	Mosquitofish	17	2	-
Lepomis cyanellus	Green sunfish	1	4	.05
		11	3	.15
		30	2	.40
Lepomis humilis	Orangespotted sunfish	1160	2	7.05
Lepomis macrochirus	Bluegill	2	6	.50
		5	5	.50
		30	4	1.50
		45	3	1.75
		175	2	3.50
Lepomis megalotis	Longear sunfish	3	4	.15
		10	3	.45
		55	2	2.75

Recreational Resources

Recreational resources within the watershed are restricted to those normally associated with local hunting and fishing activities. Lake Bolivar is relatively undeveloped for recreational purposes. Local watershed runoff maintains the water level of the lake and the outlet of the lake forms Deer Creek. The lake area exhibits natural scenic beauty and has potential for future recreation uses. At the present time its geographic location, plus the fact that other lake areas are more readily available, limits its use for such recreational purposes as water skiing, swimming, and camping, etc. Although Lake Bolivar is considered to be a good blue gill fishing lake, no boats are available on a rental basis. Mississippi Highway No. 1 follows part of the lake shoreline and a public park equipped with picnic tables is located between the highway and the lake shore. Duck hunting on the lake is not available as it is a duck refuge.

Saw Grass Lake, located in the eastern part of the watershed, has a privately owned waterfowl management area and provides waterfowl hunting as a form of recreation during fall and winter months. Other areas of the watershed provide recreation in the form of dove, quail, small game, and deer hunting activities.

Archaeological and Historic Values and Unique Scenic Areas

A professional archaeologist employed by the Mississippi Department of Archives and History has made an archaeological and historical survey of the watershed to determine the possible existence and extent of surface resources. This survey indicated the existence of 16 archaeological or historical sites within and near the watershed area. These sites are recorded as 22-Bo-540, 568, 569, 575, 576, 577, 578, 579, 580, 581, 582, and 583 and 22-Ws-535, 576, 577 and 579. An additional site, the Winterville site (22-Ws-500), is located a few miles to the southwest of the watershed and is a part of the Mississippi State Park System and is state-owned. The report states that most of the sites were single-dwelling units or hunting camps of the Baytown period. The Metcalfe site (22-Ws-579) is considered by some as a rather important occupation area. However, it is outside the watershed boundary by quite a distance.

According to the State Historic Preservation Officer, as of December 15, 1975, there were no sites in that watershed listed in the National Register of Historic Places or the most recent monthly supplement.

The National Register criteria was used on all recorded sites within the watershed area in evaluating and determining the eligibility of properties for listing in the National Register of Historic Places.

One additional site, the Burrus House (Hollywood Plantation), within the watershed area has been approved by the Mississippi Historic Preservation Professional Review Board for nomination to the National Register of Historic Places. This site will not be affected by the project measures.

Unique scenic areas within the watershed are limited to Lake Bolivar, Saw Grass Lake, and assorted bayous. These areas contain stands of large cypress trees near their outer edges. These scenic areas are considered by many to have a high degree of aesthetic value.

Soil and Water and Plant Management Status

Crops grown primarily for market in the watershed are cotton and soybeans and limited acreage of rice. Wheat and oats grown are consumed locally as livestock feed. Cotton acreage decreased 47 percent between 1949 and 1972 and increased 56 percent from 1969 to 1972. Soybean acreage harvested for beans increased about seven times during the 1949 to 1970 period. Soybean acreage is expected to continue to increase, but with less rapidity, as long as near present prices prevail. Rice acreage in 1969 was 80 percent of the acreage in 1954. These crop acreages are for Bolivar and Washington Counties, but are representative of the Deer Creek Watershed. The number of livestock reached a peak in 1954, was reduced consistently until 1969, and has leveled off since that time.

A relatively good land treatment program exists in the watershed. Approximately 2,220 acres of conservation cropping systems and crop residue management, and 12,000 acres of row arrangements have been applied to date in the watershed. Approximately 75 miles of drainage field ditches and mains and laterals have been completed. Approximately 11,000 acres of drainage and irrigation land grading and land smoothing has been completed. Additionally, approximately 3,500 acres of pasture planting, pasture management, and wildlife upland and wetland habitat management has been applied.

There are approximately 4,300 acres of land in the watershed that are subject to sheet and gully erosion. Approximately 600 of these acres are highly erodible and may be considered marginal for crop production. Much of the land in the watershed is prevented from realizing its fullest crop potential each year because of this lack of adequate drainage and/or flood protection.

Soil and Water Conservation Districts of Bolivar and Washington Counties cover the entire watershed area. These districts function in providing local rural leadership in the fields of soil and water conservation to the farmers and landowners of the watershed. The Mississippi Forestry Commission through the going Cooperative Forest Management Program furnishes management advice and assistance to the landowners of the forest lands in the watershed. The majority of these lands are being managed for wildlife habitat by their owners or are leased to hunting clubs.

A number of landowners are maintaining their forest lands for use by themselves and their employees. Some of these forest lands are classed as wetlands. Several of these landowners have expressed their intention to improve these forest lands for wildlife and waterfowl habitat. They have indicated that technical assistance now being provided by existing on-going programs are sufficient to this purpose.

It is a fairly common practice in this portion of the Mississippi Delta to construct or establish temporary restrictions to waterflow in the late fall and winter months to flood open land and forest land for waterfowl uses. Several landowners and some groups have expressed their intention to expand this practice.

Approximately 42 percent of the farms of the watershed are engaged in cooperative programs with the local Soil and Water Conservation Districts. Active farm plans cover approximately 67 percent of the watershed area, with a majority of the planned practices applied. Partial surface drainage for most of the watershed has been provided by individual and small group efforts, assisted by Soil and Water Conservation District programs of the respective counties. This effort of on-farm assistance, however, has not been able to solve the floodwater and drainage problems of the watershed area.

WATER AND RELATED LAND RESOURCE PROBLEMS

Land Treatment

A good land treatment program exists in the watershed. However, the local people recognize the need for additional measures.

There are approximately 4,300 acres of land in the watershed that are subject to erosion if not properly managed. Active farm plans cover 67 percent of the watershed area with a majority of planned practices applied. Sediment and erosion damages within the watershed are moderate. Sediment produced by sheet erosion has caused some deposition to channels and bayous serving as outlets. This has occurred over a long period of time and has not been considered a serious problem in the past.

With the advent and use of large pieces of agricultural machinery such as six and eight row tractors and corresponding planting, tilling, and harvesting equipment, a need has arisen for changes in field sizes and shapes. Economical use of equipment requires long rows, uniform drainage, and relatively level land. These changes have created unique management problems and have resulted in the need for specific land treatment measures and activities such as land smoothing, land leveling, row arrangement, and related land treatment measures.

Floodwater and Drainage

As shown by the project map, the entire Deer Creek Watershed has a water problem either from flooding alone, as shown by the dotted areas, or from flooding in conjunction with improper drainage, as shown by the solid areas.

The area that has a flooding and drainage problem makes up approximately 63 percent of the watershed, or about 27,579 acres. This area is made up of level to undulating poorly to somewhat poorly drained clay and mixed soils. These soils, in addition to being nearly level, have many low-lying narrow depressions running in all directions. There are also land locked pan type depressions with clay soils scattered throughout this area. These interlaced and land locked depressions are readily flooded and make it almost impossible for the soils in this group to dry uniformly after a heavy rain, with the wetter areas becoming the limiting factor on timely land preparation, planting, cultivation, and harvest.

The area that has a flooding only problem, only makes up approximately 37 percent or about 16,293 acres of the watershed. This area is comprised of level to gently sloping, moderately to well drained soils. The ridges and depressions in this area are more pronounced and are scattered randomly throughout the fields. In times of flooding, this condition causes flooded areas in all fields which restricts land preparation, planting, cultivation, harvest, and other cultural practices for the entire field until the excess water is removed even though only a small percentage of the field would be directly flooded.

In this watershed, as in the Mississippi Delta as a whole, the flood hazard is primarily a problem of length of inundation rather than depth. The modification in cultural practices that must take place due to the long periods of inundation in the depressions affect the yields of the entire field. Although only approximately 20,368 acres of the watershed are actually flooded, the entire watershed is affected by reduced yields and, therefore, reduced income from sale of agricultural products. For this reason the entire watershed will be directly benefited from reduced flooding and/or a combination of reduced flooding and improved drainage as shown by yellow color on the project map.

Flooding within the watershed area has not resulted in any recent loss of life and has caused no ill effects on the health of the residents of the watershed. However, the excess water provides excellent habitat for mosquitos that are carriers of encephalitis, a virus which caused 36 deaths in the state in the summer of 1975 and is expected to be present again in 1976. Of the 36 deaths confirmed by the State Board of Health, 16 were in Washington and Bolivar Counties.

Present channels provide about 40 percent effective drainage. The drainage problems are created primarily by lack of adequate outlet channels for water disposal systems. Partial surface drainage for most of the watershed has been provided by individual and small group efforts, assisted by Soil and Water Conservation District Programs of Bolivar and Washington Counties, however, these efforts have not been sufficient to solve the floodwater and drainage problems.

Irrigation Problems

Of the total land in the watershed approximately 35,000 acres are considered as agricultural cropland and as such have potential for irrigation during dry periods of the summer and early fall.

Irrigation is used in the watershed and in the general area of the watershed as a supplement to rainfall for the purpose of increasing crop yields.

Potential sources of water for irrigation include ground water from wells, water from ponds, lakes and bayous, and water from old Mississippi River channels. The latter is pumped over the river levee and piped and channeled to needed agricultural areas. Abundant ground water resources underlie the watershed area. Data indicates that water is available from five different fresh water aquifers. Much of the ground water used is drawn from the Mississippi alluvial aquifer which underlies the entire region. This aquifer is composed of sands and gravels and averages about 80 feet in thickness. The water from this aquifer is moderately mineralized and hard, and generally contains up to 16 milligrams per liter of iron in solution.1/ It is used for irrigation, mainly for the production of rice.

Irrigation systems presently in operation are adequate for present needs. Future needs will be dependent on crop demands and the availability of necessary capital and labor.

1/ Water for Industry and Agriculture in Washington County, Mississippi, 1971.

The fine textured soils of the watershed are suited for the irrigation with rice and rice-soybean combinations. The lighter soils are better suited for irrigation with cotton, soybeans, and other crops grown in the area.

The control of weeds and other unwanted vegetation is generally accomplished by use of herbicides applied either before or after planting operations, by herbicides applied during crop growth, and by mechanical cultivation.

Fish and Wildlife

Problems confronting fish and wildlife population in the watershed include those of: (1) Pollution of lakes and streams by agricultural chemicals, including insecticides, herbicides, fertilizers, and defoliants. (2) Removal of water from lakes for irrigation purposes. (3) Siltation or sedimentation of fishery resources as a result of flooding and/or natural runoff. (4) Clearing and/or removal of wildlife habitat in the form of timber stands and resulting land use changes.

Pollution of lakes and streams by agricultural chemicals is a by product of modern agricultural technology and is present in the waters of the watershed as it is throughout the delta region. Pollutants include fertilizers and plant foods, herbicides, and insecticides. These materials are used in large amounts in normal farming operations. They become dissolved in floodwaters and washed into nearby streams.

Irrigation has been a problem in the past when Lake Bolivar, in 1954, was pumped almost dry and for several years thereafter experienced poor fishing. This situation has since been corrected. Deer Creek has several earth filled dams. These and deep holes within the creek have been used for irrigation purposes with resultant water level fluctuations.

Sediment is ever present as a source of pollution, especially where the ground surface is disturbed one or more times during the course of a year.

Last but not least, drainage tends to lead the way for clearing the woodlands and changed land uses, especially in fertile agricultural areas. This results in loss of wildlife habitat and/or change from one type habitat to another.

Alligators are known to have lived in waters of the area. There are no reports of any in the watershed area at this time.

Economic and Social

Bolivar and Washington Counties of which the watershed is a part, are areas that have been designated as Area Redevelopment Act Counties in Mississippi. Approximately 31 percent of the farm operators work off farms because of low farm incomes. About 12 percent work off farms more than 100 days per year. In 1969, approximately 51 percent of the farms received less than $5,000 gross income from farm products. With the cost of production deducted from these sales, net returns would be much less. The low income-producing family type farms are scattered throughout the watershed.

It is estimated that less than 50 percent of the agricultural land in the benefited area is devoted to farms using 1½ man-years or more of hired labor.

Installation of project measures within the watershed will include many of the objectives of the overall Economic Development Plan and will promote the Rural Area Development efforts in these counties.

ENVIRONMENTAL IMPACTS

Flood Prevention, Erosion, and Sediment

The installation of land treatment measures will effect a decrease in watershed erosion of about 20 percent. The reduction in erosion through land treatment along with the sediment trap capability of the multiple purpose channels will reduce the amount of sediment available for overbank deposition, for downstream deposition, and for causing turbidity in streams of the watershed and in downstream areas from 470 mg/l to 414 mg/l or approximately 12 percent. The planned conservation land treatment and land use measures will improve the hydrologic characteristics of the soil allowing for greater water infiltration and soil moisture holding capabilities. Physical properties and fertility of the soils will be improved, resulting in greater yields and higher quality produce.

Structural measures in conjunction with land treatment measures will effect a reduction in the frequency and depth of flooding on approximately 20,368 acres of watershed lands. This will reverse the trends toward channel filling, loss of capacity, and increased flood frequency. The reduction of floodwater and drainage damages on the agricultural lands will be accomplished by the reduction of overbank runoff by approximately 60 percent.

The depth of flow below the project area will be increased approximately 0.2 feet for the 100-year, 24-hour storm and 0.1 foot for the 25-year, 24-hour storm. Increase in stages for frequencies less than the 25-year frequencies will be insignificant and range from none to 0.1 foot.

The project impact in reducing erosion and sediment rates, except during the construction period, will have the effect of making the water of lakes, ponds, and streams less turbid and therefore more attractive for fishing and recreation. The reduction of erosion resulting from more ground cover will provide better wildlife habitat. The reduction of sedimentation will prolong the life of lakes and ponds.

There will be changes in land use and cover as a result of the project action. In the rights-of-way channel work, which is estimated at 820 acres, there will be a conversion of 341 acres of forest land to open land. The installation of the project will result in a change of approximately 359 acres from cropland to grassland and other land.

Fish and Wildlife

The improved cover conditions, the wildlife food plantings, and the wildlife habitat preservation will increase and improve habitat suitable for wildlife. With the improvement of wildlife habitat, it is expected that there will be corresponding improvement in the wildlife resources of the watershed.

The intensity of right-of-way land clearing through wooded areas will vary according to the work type and degree of work needed. The 36.49 miles of

channel enlargement will require almost all the right-of-way, with the exception of some selected trees to be cleared. The 13.66 miles of channel clearing and shaping will have less effect on the forest canopy than channel enlargement activities. Land use class will remain that of forest. Channel construction activities will result in a decrease of the forest land wildlife habitat of the watershed by 341 acres and an increase of the open land wildlife habitat of the same amount.

Construction activities will result in lower water tables in the immediate vicinity of improved channel reaches. This will affect timber growth and mast production and may eventually induce changes in the plant community. Soils of the proposed channel area are, for the most part, fine textured, clayey type materials and, therefore, effects with relation to lowered water table will be limited in extent.

Approximately 50 miles of the 182 miles of channels within the watershed will have altered fishery habitat because of channel work. The effects on the fishery habitat and resources will vary with the intensity of the channel work and the present condition of the resource. The proposed channel work will contribute to the loss of the existing stream fisheries resources. It will cause a decrease in stream diversity and game fish production immediately after channel work. There will be a loss of fish food and cover and a decrease in pounds of fish per acre per area of water.

Fisheries resources will be enhanced by the reduction of sediment and associated agricultural chemicals in lakes and stream areas of the watershed. The over-excavation for sediment traps will create small pools in the channels and provide habitat for species inhabiting a lentic environment.

Channel activities will result in the possible drainage of approximately 89 acres of wetland areas (Type 7, wooded swamps) located along Channel Nos. 2 and 3 in the northeastern part of the watershed. This will be mitigated by the installation of 50 wood duck nesting boxes within the confines of Saw Grass Lake. Approximately 435 acres of wetlands (Type 7, wooded swamps) will be preserved in the present state for use by wildlife and waterfowl adjacent to portions of Channel Nos. 1 and 5 in the central and southern portion of the watershed.

Economic and Social

The overall economy of the area will be benefited by project action. Added employment as a result of the project action will amount to the equivalent of 0.4 man-years each year during the three-year construction period. After the construction period is over, it is estimated that 127.4 man-years of employment will be provided each year. This increased employment will tend to lower the unemployment rate which has been consistently high over the past years.

Better agricultural efficiency and income stability can be obtained by the farmers of the watershed in that the crops and pastures can be placed on lands where yields will be higher and more assured.

The quality of living for the people of the watershed will be enhanced through relief from flooding damages, reduction in agricultural production costs, increase in agricultural yields, reduction in vector habitat, and less interruption of transportation and service facilities.

The rural area of the watershed will be stabilized to the extent that people will be afforded a greater opportunity to remain on the land due to increased income necessary for living. Their improved income will allow them to maintain and improve necessary community facilities. The project will tend to keep an area which has been strong agriculturally available for increased agricultural production as needed by the national economy.

Agricultural production will be increased per acre as follows: Cotton from 675 lbs. to 850 lbs.; rice from 45 cwt to 52 cwt; wheat from 30 bushels to 35 bushels; soybeans from 25 bushels to 35 bushels; and pasture yield from 300 lbs. of beef to 350 lbs. It is estimated that production costs will be reduced per unit as follows: Cotton - four cents per pound; rice - 53 cents per bushel; wheat - 12 cents per bushel; soybeans - 51 cents per bushel; and beef production by one cent per pound. The quality of the harvested crops will be increased because of reductions of untimely harvesting delays due to flooding and related water problems.

Employment opportunities and standards of living of the people of the watershed, including the minority population, will be increased through direct activities and indirect effects of the project. Approximately 121 farmers or landowners, of whom approximately 40 are of the minority population, and 2,100 people who reside in the watershed will benefit either directly or indirectly from the project. All of the farmers or landowners will be directly benefited and their employees, employees' families, merchants, and service people will be indirectly benefited. As the minority populations of Bolivar and Washington Counties are 61.4 and 54.5 percent, respectively, they will be the beneficiaries of much of the benefits provided by the project.

Other

A professional archaeologist employed by the Mississippi Department of Archives and History has made an archaeological and historical survey of the watershed. The project will not affect any of the 16 sites included in the report of this survey. However, the recommendation that spoil from the channel construction of Channel 7 and Williams Bayou in the vicinity of the St. Joseph's church site (22-Ws-577) be placed on the south bank of Williams Bayou and on the eastern side of Channel 7 was adopted to assure no destruction at this site.

According to the State Historic Preservation Officer, as of December 15, 1975, there were no sites in that watershed listed in the National Register of Historic Places or the most recent monthly supplement.

The National Register criteria was used on all recorded sites within the watershed area in evaluating and determining the eligibility of properties for listing in the National Register of Historic Places.

There will be a temporary degradation of water quality in the streams below construction areas during and shortly after the construction periods due to increased erosion and sedimentation.

There will be air and noise pollution during the construction periods due to the operation of heavy equipment

FAVORABLE ENVIRONMENTAL EFFECTS

A. Reduction of flooding and lack of drainage damages, as affecting all watershed acres, will be reduced by 60 percent.

B. Reduce gross erosion rates by 20 percent by use of conservation land treatment measures.

C. The long-term sediment deposition and downstream sediment delivery will be reduced by about 12 percent.

D. Water quality in the lakes and streams will be improved except during periods of construction.

E. Physical and hydrologic properties and fertility of the soils will be improved, resulting in greater yields and higher quality produce.

F. Fisheries resources will be enhanced through reduction of sediment and associated agricultural chemicals in lakes and downstream areas.

G. Fisheries habitat will be enhanced by the formation of sediment traps in channel bottoms.

H. Approximately 435 acres of wetlands will be preserved in the present state for use as waterfowl and wildlife habitat.

I. The surface area of vector habitat will be reduced resulting in better health conditions.

J. Employment opportunities and standard of living of the people of the watershed will be increased through direct activities of the project and indirect effects of the project.

K. Waterfowl habitat will be enhanced by the installation of 50 wood duck nesting boxes.

ADVERSE ENVIRONMENTAL EFFECTS

A. Approximately 50 miles of existing stream fisheries resources will be altered by the proposed channel work.

B. Forest land wildlife habitat will be lost on 341 acres of forest land as a result of structural measures.

C. There will be a decrease in stream diversity and fish production immediately after channel work completion.

D. Approximately 89 acres of wetlands will be subject to drainage as a result of the channel work.

E. Agricultural and silviculture production will be lost or decreased on the 820 acres of land (341 acres of forest land and 479 acres of open land) committed to structural measures.

F. There will be a temporary degradation of water quality in the streams below construction areas during the construction period due to increased sedimentation.

G. There will be air and noise pollution during the construction period due to the operation of heavy equipment.

H. Lowered water tables in the immediate vicinity of improved channels will affect timber growth and mast production.

ALTERNATIVES

A number of alternatives were considered in the project evaluation process. The more reasonable of these alternatives were evaluated to the point of estimating costs and impacts. Among the alternatives considered were (1) establishment of needed land treatment in the watershed at an accelerated rate, (2) accelerated land treatment plus channel clearing, (3) accelerated land treatment, flood proofing, and conversion of land to less intensive uses, (4) land treatment combined with a series of levees, pumps, and drainage gates, (5) land treatment in combination with excavated floodway, and (6) no project.

The alternative of establishing land treatment measures involves the measures described under the heading of Planned Projects - Land Treatment. They include cropland measures such as conservation cropping systems, crop residue management, drainage field ditches, drainage mains and laterals, drainage land grading, land smoothing, row arrangements, spoil bank spreading, wells, and grade stabilization structures. Measures used on pastures include pasture planting, pasture management, drainage field ditches, drainage mains and laterals, and farm ponds. Wildlife measures include wildlife upland habitat management and wildlife wetland habitat management.

The use of this alternative would eliminate the adverse impacts associated with the installation of planned structural measures. Erosion would be reduced an estimated 20 percent. The physical condition of the soil will be improved, soil compaction will be reduced, soil aeration will be improved and water infiltration rates will be increased. Biological populations within the soil will be increased because of incorporation of organic matter and better aeration. This in turn will increase the breakdown of materials within the soil and provide a better plant-soil relationship.

Fish and wildlife habitat within the watershed will be improved through such measures as ponds, stocking and management of ponds for fish, odd area wildlife plantings, vegetation of eroding acres, and wildlife habitat improvement. Floodwater damages would be reduced approximately three percent initially but would become progressively less as channels continue to deteriorate. The cost of this alternative was estimated to be $697,600.

A second alternative considered consisted of a combination of land treatment measures and channel clearing activities. Land treatment measures would consist of those activities listed in the first alternative plan. Channel clearing activities would include the removal of trees, snags, and sediment from approximately 50 miles of stream channels.

Channel clearing measures would consist of the cutting of brush and trees within the channel banks at ground level with chain saws or similar type equipment, snaking to the top of the banks and thence to disposal areas.

Logs partially submerged and firmly lodged in the bottom areas of the channel would not be removed. In above bank right-of-way areas, a minimum of clearing for access, work and disposal areas would be performed.

The use of this alternate would retain the favorable impacts as listed for the alternate of establishing needed land treatment. Possible adverse impacts would result to stream fishery resources as a result of the removal of trees and snags from the channel proper.

Adverse impacts would also result to small fur bearing animals and other wildlife that use these areas for routine life activities.

Channel clearing of this type would, by removal of major obstructions from channel areas, increase the velocity of water over normal flow by one-fourth of one percent per mile. Studies indicated, however, that with the use of this alternate, sufficient flood protection would not be attained in the more intensely farmed parts of the watershed.

It was estimated that the cost of this project would amount to $1,098,400.

A third alternative was accelerated land treatment, floodproofing, and the conversion of areas with flooding potential to uses less susceptible to flood damage. This alternative would retain the favorable effects of the land treatment only alternative and would eliminate all of the adverse impacts previously described for structural measures. In order to floodproof the existing roads, bridges, railroads, and other property involved, it would be necessary to raise their useable levels above the elevation of the 100 year storm. About 30 miles of road, 8 miles of railroad, 20 bridges, and one pipeline and several utilities would be affected. The conversion of present agricultural land to uses less susceptible to flood damage would require changed land use of about 20,368 acres now used for growing crops and improved pastures. Positive impacts in the form of increased wildlife and fishery resources would occur.

This land use conversion would result in an extensive adverse impact to the economy of the watershed area. It is estimated that an annual loss of crop production valued at $700,000 would result from the use of this alternative. The estimated total cost of this alternative would be in excess of $15,000,000.

An alternative was considered using a combination of measures consisting of needed land treatment measures and a series of levees and pumps. This alternate consists of about 1,000 acres of leveed storage areas on one or both sides of selected stream channels at particular locations with combined usage of pumps and one way flow culverts to remove water from agricultural lands adjacent to the storage areas.

Use of the alternate would retain the favorable impacts as listed for the alternate of establishing needed land treatment. It would reduce flooding within the watershed favorably to other alternatives considered.

The use of this plan would necessitate the committing of approximately 1,000 acres of prime agricultural lands to water storage areas. Adverse impacts to wildlife and stream fishery habitat would be avoided. Storage areas could be used for irrigation purposes during dry periods.

Possible operation and maintenance problems could arise with a project of this type due to levee bank erosion and normal wear of pumping equipment. The cost of this alternative was estimated to be about $3,232,000.

An alternative was considered using a combination of accelerated land treatment and excavated floodway. This alternate would retain the favorable impacts associated with the land treatment only alternate but would require extensive construction of new channel. Channel activities would require the construction of a channel of increasing size as one proceeds downstream. This would result in near total destruction of the stream fishery resources and major clearing of hardwood timber along the channel rights-of-way. This alternate would increase the flood stages downstream from the construction areas due to concentration of flood flow. Adverse impacts would result to stream fishery resources and wildlife habitat. Downstream channels would not be able to contain peak flows. This would result in potential flooding hazard to downstream agricultural areas and towns. The cost of this alternative was estimated to be $4,617,600.

The no project alternative would not eliminate or lessen any of the problems that exist in the watershed. Adverse impacts resulting from the planned project would be eliminated, however. This alternative would not reverse the trend of more frequent and more intense flooding on 20,368 acres of agricultural lands of the watershed subject to excess water problems. Stream channels would continue to fill with brush, trees, and other obstructions causing flood damages to escalate to the point that cultivated and pasture areas would be abandoned in favor of water tolerant plants. This would result in a loss of income to the people of the area and would worsen the social problems. It is estimated that a net annual benefit of $219,200 would be lost if this alternative course of action is used.

SHORT TERM VS. LONG TERM USE OF RESOURCES

a. The watershed lands are, in the majority, now being used for agricultural production. This agricultural production is mainly in the form of crop production with cotton, soybeans, and rice as the principal crops grown. A very small percentage of the land is in the towns and villages of the watershed. The lands of the watershed have been in crops for some time and is expected to remain in crop production. Yields of crops, particularly cotton, has been reduced on a per acre basis as a result of inadequate surface drainage and flooding conditions. It is felt that this project will tend to reverse this trend and allow for better utilization of lands within their capabilities.

b. The project will help to solve a portion of the immediate or short term problems and will serve as a base for satisfying the forseeable long term needs. The only options for long term uses of land that will be reduced is for the 820 acres of land that will be used for the multiple purpose channels. There will be a disturbance of some soils and vegetation during construction of channels, access roads, and during installation of land treatment measures. Stabilization will occur within the first growing season following construction and installation of project measures.

c. The project is compatible with the projected long-term uses of land, water, and other natural resources. The project gives sufficient flood protection so that some needed land use adjustment can be made. It also provides for improvement in the physical, economic, scenic, and environmental features of the watershed. The project is planned in such a way that it can serve as a base for planners of the future to build on and serve the overall needs of the watershed and its people.

d. The project through its improvement of the watershed cover conditions, the reduction of erosion and sediment, the retention of water in upland areas, and the reduction of water on lowland areas will serve as a good base for conserving water and land resources long after its design life has passed.

e. Cumulative effects in the Yazoo River Basin as a result of PL-566 projects such as the Deer Creek Watershed project will be determined by the needs of the people of the area and will include such items as reduction of flooding, increase in adequate drainage of lands, increased crop yields in quantity and quality, increase in per capita income, better roads and schools, and in general a higher standard of living. Changes within the area will be relatively minor. Because of production potential of the soils and needs of an ever increasing national and world population, cropland acreages will increase slightly, grassland will increase slightly, while forest lands and other lands will tend to reduce slightly in acreage.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The project will commit 341 acres of woodland and 479 acres of open land to multiple purpose stream channels. Selected trees and other vegetation will be allowed to remain wherever possible in construction areas. Disturbed areas will be revegetated as soon as possible after installation of project measures. The lands within the channel right-of-way can be used only to the extent that the channel itself and the access for maintenance is not affected.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

The formulation of the Deer Creek Watershed project has taken much time and consideration. Meetings concerning watershed problems were held in the watershed prior to March 1965. Purposes of these meetings were to discuss problems of the watershed and ways and means of resolving them. On March 26, 1965, the Chancellor of the Chancery Court of Washington County, Mississippi, entered decrees, creating, organizing, and establishing the Deer Creek Water Management District, naming the commissioners and conferring on such District all powers enumerated in enabling legislation.

A meeting was held during the fall of 1965 between members of the newly formed Water Management District, representatives of the Soil Conservation Service, and interested landowners. Matters pertaining to the planning of the watershed were discussed.

During September 1969 consultation occurred between the SCS and the USDI, Bureau of Sport Fisheries and Wildlife concerning Deer Creek Watershed.

During October 1969 the USDI, National Park Service was contacted regarding the watershed plans for the Deer Creek area.

A meeting between members of the Water Management District and representatives of the Soil Conservation Service was held on September 17, 1970. The purpose of this meeting was to inform the Watershed Commissioners and their attorney of the progress of the planning in the watershed.

Conferences were carried out between members of the SCS and the Corps of Engineers regarding responsibilities of the different agencies for channel work in the different parts of Deer Creek.

A meeting was held May 26, 1971, between members of the Water Management District and selected personnel of the SCS. Watershed planning and engineering particulars were discussed.

Another meeting was held January 20, 1972. Members of the Water Manage- District, SCS representatives, and interested landowners were present. Various aspects related to watershed planning were discussed. Included among these were costs and cost sharing, responsibilities of the various parties, and wildlife and environmental aspects of the watershed.

A meeting was held August 29, 1972, between representatives of the sponsoring organization and the SCS. The purpose of this meeting was to discuss the status of watershed planning and cost-sharing responsibilities.

During October 1972 the SCS contacted the Mississippi State Game and Fish Commission to seek assistance in the planning process with respect to the Deer Creek Watershed project.

An interagency wildlife review was made October 31, 1972. Participants included representatives of the SCS, the Mississippi Game and Fish Commission, and the U. S. Fish and Wildlife Service.

A public meeting was held on March 21, 1974, to (1) fully inform the landowners on whose property the works of improvement were to be installed, (2) to inform other landowners or residents in the watershed who might be assessed to help finance the works of improvement, (3) to inform all special interest groups who might be concerned over the effects of the project on the environment, (4) to inform the general public, and (5) to invite and allow interested persons to voice questions and express views regarding the project.

In April 1974 a contract was made with the Mississippi Department of Archives and History to perform preliminary archaeological and historical studies in the Deer Creek Watershed to determine the existence and extent of possible archaeological and historic values.

According to the State Historic Preservation Officer, as of December 15, 1975, there were no sites in that watershed listed in the national Register of Historic Places or the most recent monthly supplement.

The National Register criteria was used on all recorded sites within the watershed area in evaluating and determining the eligibility of properties for listing in the National Register of Historic Places.

A meeting was held on May 16, 1974. Representatives of the SCS, the Deer Creek Water Management District and others were present. The purpose of the meeting was to discuss recent developments in the watershed. Possible changes in the proposed project were discussed.

Meetings were held in March and June of 1975 with representatives of the U. S. Corps of Engineers to determine the adequacy of the plan designs. Apparent problems were resolved to the mutual satisfaction of the SCS and the Corps of Engineers.

The Mississippi Air and Water Pollution Control Commission was consulted in July 1975 relative to waste discharges in Deer Creek Watershed. There were none to their knowledge.

Discussions and Disposition of Each Comment on Draft Statement

Comments were requested from the following agencies:

U. S. Department of the Army
U. S. Department of Commerce
U. S. Department of Health, Education, and Welfare
U. S. Department of the Interior
U. S. Department of Transportation
Advisory Council on Historic Preservation
Office of Equal Opportunity - USDA
Environmental Protection Agency
Federal Power Commission
Governor, State of Mississippi
Federal State Programs, Office of the Governor
South Delta Planning and Development District

The following agencies have responded: U. S. Department of Commerce, U.S. Department of Health, Education, and Welfare; U. S. Department of the Interior; Office of Equal Opportunity, USDA; Environmental Protection Agency; Federal State Programs, Office of the Governor; and Delta Council.

Each issue, problem, or objection is summarized and a response given on the following pages. Comments are serially numbered where agencies have supplied multiple comments. The original letters of comment appear in Appendix B.

U. S. Department of Commerce

Comment: The Department of Commerce states, "Bench marks, triangulation stations, and traverse stations have been established by the National Geodetic Survey in the vicinity of the proposed project. Construction required for the project could result in destruction or damage to some of these monuments.

The National Geodetic Survey requires sufficient advance notification of impending disturbance or destruction of monuments so that plans can be made for their relocation. The National Geodetic Survey recommends that provision be made in the project funding to cover costs of monument relocation."

Response: It is unlikely that it will be necessary to disturb monuments during construction of channels. During development of final construction plans, if it is evident that a monument will be disturbed, the National Geodetic Survey will be contacted and provisions made to relocate it.

U. S. Department of Health, Education, and Welfare

(1) Comment: The Department comment reads, "Page 8, line 31 indicates that sprays will be used to "control noxious weeds and unwanted vegetation" in the maintenance of the flood prevention channels. What sprays will be used? Also, what control measures will be taken to minimize the entry of these agents into the aquatic environment and the ingestion by grazing animals in the immediate area?"

Response: Sprays used are herbicides to retard or kill woody vegetation which restricts channel flow. The herbicides used will be those approved by the U. S. Environmental Protection Agency for use adjacent to aquatic areas. Care will be exercised in the application and spraying of target areas.

(2) Comment: The Department comment reads, "Page 17, line 33 states that "... the most pronounced factor limiting the fishery resource is the widespread use of pesticides within the watershed". We assume from this statement that one of the goals of the project is to reduce the further contamination of the water. On the basis of our assumption, how, specifically, will this be accomplished?"

Response: The reduction of further pesticide contamination of the water will be accomplished in part by the application of land treatment measures and practices included in the Planned Project section, page three, of the environmental impact statement. These practices are designed to reduce the erosion and movement of soils and, by so doing, will reduce the movement of attached pesticides. Additional portions of sediment and attached pesticides will be removed by sediment traps which are designed as a part of the proposed channels.

(3) Comment: The Department asks, "Will it be necessary to remove any of the sediment which accumulates behind the floodwater retarding structure? What would be the disposal process?"

Response: There is no floodwater retarding structure in the proposed plan. A water level control structure is planned at the outlet of Lake Bolivar to maintain the water level in the lake. No plans have been made for removal of sediment from this structure.

U. S. Department of the Interior

(1) Comment: The Department comment reads, "The table on page 4 and 5 of the Selected Alternative Environmental Quality Account does not include the 89 acres of Type 7 wetlands that will be drained as a result of the selected plan."

Response: The information that the 89 acres of Type 7 wetlands will become subject to drainage as a result of project action, has been included in the Selected Alternative Environmental Quality Account.

(2) Comment: The Department states, "The acreage and specific plans for wildlife upland management and wildlife wetland habitat management should be discussed."

Response: Agreed. Wildlife habitat management and wildlife wetland habitat management have been discussed in both the work plan (page 28) and the environmental impact statement (page 4). Wildlife habitat management and wildlife wetland habitat are land treatment measures and do not have specific plansprepared in the work plan development stage as do the structural measures. These plans will be developed as a part of the landowner or operator's conservation plan. The SCS biologist assigned to work in this area will assist the landowner and the conservation planner in the development of the measures.

(3) Comment: The Department comment reads, "It is mentioned that channelization will result in possible drainage of 89 acres of Type 7 wetlands (wooded swamps) along channels 2 and 3, and that approximately 435 acres of Type 7 wetlands along channels 1 and 5 are to be retained in their present state. The alternative of deleting channel work that would have severe adverse effects on wetlands should be considered."

Response: Agreed. The alternative of deleting certain channel work has been considered. Since it was desirable to retain the channels, the waterfowl losses along channels 2 and 3 will be mitigated by the installation of 50 wood duck nesting boxes in suitable wood duck breeding habitat. The wetlands along channels 1 and 5 will be retained by channel construction methods and locations favoring their retention.

(4) Comment: The Department states, "The terms wildlife habitat management and wildlife wetland habitat management refer to retaining, creating, or managing habitat. This definition of management is too broad. The reader would have a better understanding of what is to be accomplished if the text stated that existing habitat is to be retained in its present condition, that habitat will be expanded, or that habitat conditions will be improved by various management techniques on specific areas."

Response: Terminology used is accepted standard SCS terminology. Additional information, however, has been included in text of both the work plan (page 15) and environmental impact statement (page 24).

(5) Comment: The Department comment states, "The frequency and depth of flood protection to be provided by channel sizes computed on the basis of a formula (page 4, paragraph 4), should be discussed."

Response: This has been discussed in the Investigation and Analyses portion of the Deer Creek Work Plan (See page 58). However, with respect to the above comment the following information has been inserted into the environmental impact statement, page 4, paragraph 7.

The rate of runoff provided by the design criterion Q = 40 M 5/6 was used as the basic design of all channel improvements. This design capacity will provide for the removal of 1.50 inches of runoff in 24 hours from one square mile drainage area. A channel designed for this capacity will reduce existing floodwater damage to crop and pastures by 60 percent.

(6) Comment: The Department comment states, "The first paragraph on page 7 of the Environmental Statement mentions that woodlands and miscellaneous lands will remain as they were without the project while other lands will increase by about 7 percent. This statement conflicts with data in the following table which shows a 341 acre reduction in forest land acreage, a 443 acre increase in other lands, and no change in miscellaneous lands. Clarification of the data is desired."

Response: The information as stated was in error and has been corrected to read as follows: Lands allocated to grasslands will increase by approximately 16 percent, forestland will decrease by six percent, other lands will increase by approximately 31 percent and miscellaneous lands will remain as they were before the project.

(7) Comment: The Department comment reads, "Statements suggesting that improved cover conditions, wildlife food plantings, and wildlife habitat preservation will improve conditions for wildlife are questionable. The impact of the loss of 341 acres of woodlands and 89 acres of Type 7 wetlands could be offset to some extent by proposed food plantings; however, the acreage and other specific information on the areas to be planted is not stated. Without additional information, the net effects of the proposal on wildlife cannot be properly evaluated."

Response: Additional data regarding land treatment measures have been included in the EIS, pages 3, 4, 18, and 19.

(8) Comment: The Department comment states, "The adverse effects of the project from drainage and drier soil conditions around cypress and bottomland hardwood trees is not discussed. This could adversely affect timber growth and mast production and may result in a decrease in the long-range productivity of these areas from a wildlife standpoint."

Response: The water table will tend to be lowered in the immediate vicinity of improved channel reaches. This will affect timber growth rates and eventually induce a change to a different plant community. Additionally, a reduction of mast crops may occur in timber immediately adjacent to improved channel areas. The soils of the proposed channel areas, however, are for the most part, fine textured clayey type materials and, therefore, the effects will be limited in extent.

(9) Comment: The Department comment reads, "The watershed lies entirely within the Mississippi River Alluvial Plain, and there are no gas or oil wells within the watershed; however, there are several gas pipelines which cross the watershed. A small amount of sand and gravel is mined in Bolivar and Washington Counties, but there is no mention of non-fuel mineral production or resources in either the work plan or environmental statement. The project should not have a significant impact on mineral resources in the area."

Response: Sand and gravel resources are located in Bolivar and Washington Counties, Mississippi. These resources, however, are located in areas other than the Deer Creek Watershed.

(10) Comment: The Department comment states that, "Inasmuch as the environmental statement indicates water quality improvement as a favorable environmental effect, paragraph C, baseline data on the physical, chemical, and biological water quality of the project area should be included."

Response: Agreed. Stream data including chemical and physical analyses have been included in the work plan (page 9) and environmental impact statement (page 17).

(11) Comment: The Department comment reads, "Effects on groundwater of land treatment measures which will improve infiltration, and possibly recharge should be evaluated along with effects resulting from the construction of irrigation wells and drainage ditches. Effects on groundwater levels from these measures should also be evaluated in relation to streamflow."

Response: Land treatment measures will improve infiltration and recharge of the Mississippi River Alluvium. The water levels are shallow in the alluvium (from 5 to 30 feet below the surface) and average about 140 feet thick. Water levels are cyclic and reflect climatic conditions of the area and recover seasonally from rainfall and streamflow. Irrigation, cooling water, and industrial water supplies are from the shallow alluvial aquifer.

The recharge area of the deeper Tertiary aquifers are to the east of the delta area in the hill section of the state. Water levels in these aquifers are slow to react to climatic changes. The deeper Tertiary aquifers are used for most municipal and domestic water supplies.

(12) Comment: The Department comment reads, "We are in agreement that pools formed by overexcavation of sediment traps will help retard downstream sedimentation and that sediment traps could provide fish habitat. It seems probable, however, that periodic use of water from these pools for irrigation will preclude significant fisheries habitat benefits in the sediment traps. In support of your conclusion, additional information is needed about irrigation demands from these sediment traps."

Response: The channel sediment traps of Deer Creek Watershed are not designed to provide the holding capacity for the amount of water that would be necessary for potential irrigation uses. Therefore, it is not anticipated that they will be utilized as a source of irrigation water.

(13) Comment: The Department comment states, "The comments of the State Historic Preservation Officer should be included in the final statement."

Response: The most recent comments of the State Historic Preservation Officer have been included in the final statement. They read as follows, "There are no sites in that watershed listed in the National Register of Historic Places or the most recent monthly supplement. The National Register Criteria was used on all recorded sites in evaluating and determining the eligibility of properties for listing in the National Register of Historic Places."

Office of Equal Opportunity, USDA

Comment: The Office of Equal Opportunity comments are as follows: "In the discussion of the economic and social impact of the project (Environmental Impacts, pages 26 and 27) there is no specific mention of the effects that the project would have on the large minority population living in the affected area (54.5 percent in Washington County and 61.4 percent in Bolivar County).

In accordance with Soil Conservation Guidelines for preparing environmental impact statements (See Federal Register, Vol. 39, No. 107, June 3, 1974), we recommend that in the final draft you include an assessment of the social and economic impacts of impending changes in job opportunities, farming resources, etc., as they relate to minorities."

Response: The above comments have been noted and additional information has been included in the body of the EIS, page 30.

Environmental Protection Agency

(1) Comment: EPA commented that insufficient data was given with regard to sedimentation traps to evaluate their effectiveness in elimination of sediments and pollutants, and that retention time should be given for 1, 5, 10 year and large storm frequencies so that their effectiveness could be evaluated.

Response: The sediment traps are not large enough to effectively remove sediment during storm runoff but are designed to reduce the sediment concentration during receding flows. The traps are to be constructed by over excavation of the channel and leaving earthen blocks

alternately in the channel to retain water. The water retained in the channel system after a storm runoff will be subjected to extensive settling time, depending upon the interflow (water movement due to over saturated soil). Since the streams are ephemeral or intermittent, the retained water will have a settling time approximately equal to the time between rain storms.

(2) Comment: EPA comment No. 2 reads, "Many pollutants are attached to fine silt particles with one or more days settling time, but if the sediment traps catch only the larger particles, most of the attached pollutants will continue downstream, placing a greater load on the downstream areas."

Response: According to the comment, one or more days of settling time will be necessary for the removal of the fine silt particles from the stream. Presently, the one or more days of detention time is not available during storm runoff without the project; therefore, the project should not be changing the concentration of fine silt particles and pollutants downstream. During the interflow (water movement from over saturated soil) and after the main storm runoff has passed downstream, the sediment traps will provide more storage than what is presently available, consequently improving the fine grain soil removal rate. From the summary table on the following page, of water quality analyses conducted on Deer Creek, note that the pesticides, total phosphorous, and total suspended solids varied very little from the upper part of the stream (Stations 3 & 4) to the lower stream area (Station 1). This indicates that practically no settling is occurring.

(3) Comment: EPA suggested that dissolved nutrients and minerals would not be caught in the sediment traps in any event.

Response: The dissolved nutrients and minerals will not settle out without project conditions nor are the elements expected to settle out with project conditions.

(4) Comment: EPA comment No. 4 reads, "It should be pointed out that a channelized stream has less assimilative capacity and offers little in the way of purification, except that

STREAM DATA--CHEMICAL AND PHYSICAL ANALYSES

Deer Creek Watershed, Mississippi

Parameters	Interflow				24 Hr.			Storm Runoff	
	Sample Stations				Sample Stations			Sample Stations	
	1	2	3	4	1	3	4	1	3
	Range of Values								
Dissolved Oxygen, mg/l	4.4 - 5.2	5.4 - 5.5	5.5 - 6.0	5.1 - 5.3	4.4 - 6.2	3.9 - 5.9	3.7 - 5.5	4.0 - 4.6	4.4 - 4.7
Flow, cfs	60 - 70	60 - 70	55 - 65	35 - 40	60	55	35	60 - 95	60 - 95
Nitrate, mg/l	0.05	0.06 - 0.11	0.08	0.08 - 0.15	-	-	-	0.09 - 0.13	0.09 - 0.14
pH	6.1 - 6.4	6.4	6.4	6.3 - 6.5	6.1 - 6.6	6.3 - 6.8	6.1 - 6.6	6.3 - 6.7	6.3 - 6.7
Pesticides									
Methyl Parathion, ppb	0	0	0	0	-	-	-	0	0
Toxaphene, ppb	0	1.8 - 3.1	2.4 - 2.5	1.5 - 2.4	-	-	-	0.06 - 2.0	0.66 - 2.01
Total Phosphorus, mg/l	0.08 - 0.16	0.04 - 0.20	0.03 - 0.26	0.07 - 0.21	-	-	-	0.17 - 0.28	0.18 - 0.29
Ortho Phosphorus, mg/l					-	-	-		
Total Solids, mg/l	166 - 177	172 - 173	108 - 160	96 - 163	-	-	-	323 - 809	247 - 454
Total Suspended Solids, mg/l	30 - 46	27 - 46	28 - 31	14 - 50	-	-	-	12 - 38	14 - 48
Total Dissolved Solids, mg/l	120 - 147	126 - 146	77 - 132	46 - 149	-	-	-	306 - 786	215 - 406
Specific Conductance, Micromhas/cm	240 - 252	228 - 250	225 - 250	192 - 205	-	-	-	470 - 552	439 - 470
Temperature									
Air, ^{o}C	31 - 33	32 - 34	32 - 34	32 - 35	19 - 32	19 - 32	19 - 32	28 - 31	28 - 31
Water, ^{o}C	25 - 28	27 - 30	27 - 30	28 - 32	24 - 27	24 - 27	25 - 29	26 - 27	26 - 28
Turbidity JTU	<25	<25	<25	<25	-	-	-	<25 - 45	<25 - 45

some of the coarser materials are removed in the sediment traps and some reaeration will be provided in the channelized streambed. Therefore, we question the statement in Chapter V (line 6) that "water quality in the lakes and streams will be improved.

Response: The normal approach taken to evaluate the waste assimilative capacity of a stream is to describe the change of dissolved oxygen of the stream. The change in dissolved oxygen is normally modeled and the model is based on the conservation of mass equation. The actual equation frequently used is :

$$\Delta C = K_a (C_s - C)\, t - k_c\, Lo\, t\, e^{-k_c t} - k_n\, t\, No\, e^{-k_n t} \pm \text{Sources \& Sinks}$$

ΔC = Change in concentration of dissolved oxygen

k_a = Reaeration rate

C_s = Saturation concentration of dissolved oxygen

C = Concentration of dissolved oxygen in the upper part of the stream segment being modeled

t = Time of stream travel within stream segment

k_c = Decay rate for carboneous biochemical oxygen demand (CBOD)

Lo = Cencentration of CBOD

k_n = Decay rate for nitrogenous biochemical oxygen demand (NBOD)

No = Concentration of NBOD

Sources & Sinks = Other possible sources and sinks of oxygen such as benthic demand, groundwater inflow, etc.

After the project has been installed and the stream's aquatic community re-established during the healing time, the only variables that should change in the model are t (time of travel) and k_a (reaeration rate). Since the stream is ephemeral or intermittent, the critical 7-day Q_{10} low flow condition cannot be observed due to absence of flow; therefore, the time of travel and reaeration rate would only apply to storm runoff and the storm's

interflow, which is extremely variable. With the project installed, the velocity increase should increase the reaeration rate and decrease the reaction time, thereby increasing the dissolved oxygen concentration, but increase the remaining CBOD and NBOD leaving the project area. Since the only point source is from Benoit's lagoon system serving a population of 473, the CBOD and NBOD should be insufficient.

(5) Comment: EPA comment No. 5 indicated that under flood flows where the flood plain benefits are not or cannot be utilized because of the increased channel capacity, water quality will be degraded.

Response: The utilization of the flood plain for flood flows was not defined in the comment. It is assumed that the benefits considered are the deposition of sediment from the overflow. The deposition of sediment on the flood plain will create crop and timber damage. Also, the overflow scours the floor of the flood plain near the channel and suspends additional sediment in solution. With the deposition, changes of channel path is also frequent due to deposition near curves causing the stream to seek a new path. This change of flow direction induces additional soil suspension. The project should reduce stream meander and due to stability design, it should not have bank scour.

(6) Comment: EPA comment No. 6 states, "There will be a permanent overall reduction in water quality in the stream due to channelization, and this fact should be pointed out."

Response: The previous specific comments eluded to this generalized conclusion and the response addressed each specific comment. Upon review of the comments and responses, SCS disagrees with this conclusion.

Federal State Programs - Office of the Governor

(1) Comment: "The State Clearinghouse has received notification of intent to apply for Federal assistance as described above."

Response: No response is required.

(2) Comment: "Although there is no applicable state plan for Mississippi, the proposed project appears to be consistent with present state goals and policies."

Response: No response is required.

(3) Comment: "Enclosed are letters from the State Board of Water Commissioners, Mississippi State Highway Department, and the Delta Council which are made a part of this clearinghouse action."

Response: Comments from the agencies listed above are responded to later in this document.

(4) Comment: "This notice constitutes FINAL STATE CLEARINGHOUSE REVIEW AND COMMENT. The requirements of U. S. Office of Management and Budget Circular No. A-95 have been met at the State level."

Response: No response required.

State of Mississippi - Board of Water Commissioners

Comment: The Board commented to the effect that the Deer Creek Watershed Work Plan and EIS had been circulated among the appropriate agencies of the State of Mississippi and that no objections against the necessity or benefits of the plan was brought out in this review.

Response: No response required.

Mississippi State Highway Department

Comment: "We note that in paragraph three, page twnety-seven, that a culvert must be replaced on Mississippi State Highway No. 450. Even though the culvert is to be installed by others, a permit from the Mississippi State Highway Department must be obtained. This coordination should be handled through our Maintenance Division in Yazoo City, prior to commencing construction.

We also note that in paragraph two, page twenty eight, that a bridge on Mississippi Highway No. 1 will have to be replaced. Coordination on this matter has already been accomplished by Soil Conservation and Highway Officials."

Response: At the time final construction plans are being developed the State Highway Department will again be contacted and details of bridge requirements worked out.

Delta Council

Comment: The Delta Council comment states, "We have reviewed the project plans with a great deal of interest and it appears to us that benefits far outweigh any adverse impacts. In fact, the plan has been modified in a number of its aspects to eliminate any possible adverse impact and, fish and wildlife habitat within the watershed would be improved in many instances.

We, therefore, recommend that the project be approved and the work implemented as soon as possible."

Response: No response is required.

List of Appendixes:

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Copies of Letters of Comment Received on the Draft Environmental Impact Statement

Appendix C - Project Map

APPROVED BY Acting W. L. Heard, State Conservationist DATE 3/23/76

APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Deer Creek Watershed, Mississippi
(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/					Average Annual Cost 3/	Benefit Cost Ratio
	Damage Reduction	Drainage	Redevelopment	Secondary	Total		
Multiple-Purpose Channel Work Approximately 50.1 miles together with appurtenances	233,100	101,300	22,600	44,300	401,300	153,700	2.6:1.0
Project Administration	////	////	////	////	////	17,700	////
GRAND TOTAL	233,100 2/	101,300	22,600	44,300	401,300	171,400	2.3:1.0

1/ Price base current normalized.

2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $10,000 annually.

3/ Installation, 1975 prices, amortized for 50 years at 6 1/8 percent interest (0.06455). Operation and Maintenance current (1975) prices.

ENVIRONMENTAL IMPACT STATEMENT
FOR
DEER CREEK WATERSHED

APPENDIX B

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

November 4, 1975

Mr. W. L. Heard
State Conservationist
Department of Agriculture
Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

Reference your draft environmental impact statement entitled "Deer Creek Watershed and Work Plan." In order to expedite transmittal of the enclosed comments from the National Oceanic and Atmospheric Administration, we are sending them to you in the form in which they were received in this office.

Thank you for giving us an opportunity to provide these comments which we hope will be of assistance to you. We would appreciate receiving four (4) copies of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosures

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Md. 20852

October 9, 1975

DEIS 7509.25 - Deer Creek Watershed and Work Plan

To: Director, Office of Ecology and
Environmental Conservation, KCAA

The National Geodetic Survey does not have any comments on subject draft environmental impact statement, other than the possible impact on monuments of the National Geodetic Control Networks.

Bench marks, triangulation stations, and traverse stations have been established by the National Geodetic Survey in the vicinity of the proposed project. Construction required for the project could result in destruction or damage to some of these monuments.

The National Geodetic Survey requires sufficient advance notification of impending disturbance or destruction of monuments so that plans can be made for their relocation. The National Geodetic Survey recommends that provision be made in the project funding to cover costs of monument relocation.

Gordon Lill
Deputy Director
National Ocean Survey

7575

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

OCT 23 1975

Mr. W.L. Heard
State Conservationist
Soil Conservation Service
Department of Agriculture
P.O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

We have reviewed the draft Environmental Impact Statement concerning the Deer Creek Watershed, Mississippi. On the basis of our review, we offer the following comments:

1 - Page 8, line 31 indicates that sprays will be used to "control noxious weeds and unwanted vegetation" in the maintenance of the flood prevention channels. What sprays will be used? Also, what control measures will be taken to minimize the entry of these agents into the aquatic environment and the ingestion by grazing animals in the immediate area?

2 - Page 17, line 33 states that "... the most pronounced factor limiting the fishery resource is the widespread use of pesticides within the watershed". We assume from this statement that one of the goals of the project is to reduce the further contamination of the water. On the basis of our assumption, how, specifically, will this be accomplished?

3 - Will it be necessary to remove any of the sediment which accumulates behind the floodwater retarding structure? What would be the disposal process?

Thank you for the cpportunity to review the document.

Sincerely,

Charles Custard

Charles Custard
Director,
Office of Environmental Affairs

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer
to: ER-75/890

NOV 26 1975

Dear Mr. Heard:

Thank you for the letter of September 8, 1975, requesting our views and comments on the work plan and draft environmental statement for Deer Creek Watershed, Bolivar and Washington Counties, Mississippi. Our review indicates that the proposal is adequate as it relates to outdoor recreation, and we are pleased to note the efforts made to consider cultural resources during the planning stage of this proposal. Several portions of the documents, however, should be strengthened with additional information.

Watershed Work Plan

Pages 4-5, Selected Alternative Environmental Quality Account

The table does not include the 89 acres of type 7 wetlands that will be drained as a result of the selected plan.

Pages 25-26, Work of Improvement to be Installed

The acreage and specific plans for "wildlife upland management" and "wildlife wetland habitat management" should be discussed.

Effects of Works of Improvements

Page 34, Fish and Wildlife

It is mentioned that channelization will result in possible drainage of 89 acres of type 7 wetlands (wooded swamps) along channels 2 and 3, and that approximately 435 acres of type 7 wetlands along channels 1 and 5 are to be retained in their present state. The alternative of deleting channel work that would have severe adverse effects on wetlands should be considered. Readers may be able to suggest other alternatives to avoid damages to these wetlands, if their location were shown on the map, figure 5.

We call attention to the Soil Conservation Service's CONSERVATION PLANNING MEMORANDUM - 15, dated May 5, 1975, which states your Service's policy relative to the conservation of wetlands. Policy items 1 and 4 of this memorandum seem especially pertinent.

The Department's Fish and Wildlife Service would be pleased to continue working with you in your efforts to preserve these resources.

Draft Environmental Statement

Page 4, Planned Project

The terms "wildlife habitat management" and "wildlife wetland habitat management" refer to retaining, creating, or managing habitat. This definition of management is too broad. The reader would have a better understanding of what is to be accomplished if the text stated that existing habitat is to be retained in its present condition, that habitat will be expanded, or that habitat conditions will be improved by various management techniques on specific areas.

The frequency and depth of flood protection to be provided by channel sizes computed on the basis of a formula (page 4, paragraph 4), should be discussed.

Page 7, Land Use Changes

The first paragraph mentions that woodlands and miscellaneous lands will remain as they were without the project while other lands will increase by about 7 percent. This statement conflicts with data in the following table which shows a 341-acre reduction in forest land acreage, a 443-acre increase in other lands, and no change in miscellaneous lands. Clarification of the data is desired.

Environmental Impacts

Pages 25 and 26, Fish and Wildlife

Statements suggesting that improved cover conditions, wildlife food plantings, and wildlife habitat preservation will improve conditions for wildlife are questionable. The impact of the loss of 341 acres of woodlands and 89 acres of type 7

wetlands 1/ could be offset to some extent by proposed food plantings; however, the acreage and other specific information on the areas to be planted is not stated. Without additional information, the net effects of the proposal on wildlife cannot be properly evaluated.

The adverse effects of the project from drainage and drier soil conditions around cypress and bottom-land hardwood trees is not discussed. This could adversely affect timber growth and mast production and may result in a decrease in the long-range productivity of these areas from a wildlife standpoint.

The watershed lies entirely within the Mississippi River Alluvial Plain, and there are "no gas or oil wells within the watershed, however, there are several gas pipelines which cross the watershed." A small amount of sand and gravel is mined in Bolivar and Washington Counties, but there is no mention of non-fuel mineral production or resources in either the workplan or environmental statement. The project should not have a significant impact on mineral resources in the area.

Page 28, Favorable Environmental Effects

Inasmuch as the environmental statement indicates water-quality improvement as a favorable environmental effect, paragraph D, baseline data on the physical, chemical, and biological water quality of the project area should be included.

Effects on ground water of land-treatment measures which will improve infiltration and possibly recharge should be evaluated along with effects resulting from the construction of irrigation wells and drainage ditches. Effects on ground-water levels from these measures should also be evaluated in relation to streamflow.

Item G. We are in agreement that pools formed by over excavation of sediment traps will help retard downstream sedimentation and that sediment traps could provide fish habitat. It seems probable, however, that periodic use

1/ U.S. Department of the Interior, Fish and Wildlife Service, "Wetlands of the United States," Circular 39. Reissued 1971.

of water from these pools for irrigation will preclude significant fisheries habitat benefits in the sediment traps. In support of your conclusion, additional information is needed about irrigations demands from these sediment traps.

Appendix

The comments of the State Historic Preservation Officer should be included in the final statement.

We hope these comments and suggestions will be of assistance to you.

Sincerely yours,

Stanley D. Sorensen

Deputy Assistant Secretary of the Interior

W. L. Heard
State Conservationist
Soil Conservation Service
P.O. Box 610
Jackson, Mississippi 39205

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

OFFICE OF EQUAL OPPORTUNITY

SEP 24 1975

IN REPLY
REFER TO: 8140 - Supplement 7

SUBJECT: Draft Environmental Impact Statement
Deer Creek Watershed, Mississippi

TO: W.L. Heard
State Conservationist

THROUGH: Verne M. Bathurst
Deputy Administrator
for Management, SCS

The Deer Creek Watershed Environmental Impact Statement (EIS) was reviewed by this office to assess the civil rights impact for the socio-economic effects on minority groups.

In the discussion of the economic and social impact of the project (Environmental Impacts, pages 26 and 27) there is no specific mention of the effects that the project would have on the large minority population living in the affected area (55.1 percent in Washington County and 37.0 percent in Bolivar County).

In accordance with Soil Conservation Service Guidelines for preparing environmental impact statements (See Federal Register, Vol. 39, No. 107, June 3, 1974), we recommend that in the final draft you include an assessment of the social and economic impacts of impending changes in job opportunities, farming resources, etc. as they relate to minorities.

Miles S. Washington, Jr.

MILES S. WASHINGTON, JR.
Acting Director

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

November 18, 1975

Mr. W. L. Heard
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 39205

Dear Mr. Heard:

We have reviewed the Draft Environmental Impact Statement for the Deer Creek Watershed in Bolivar and Washington Counties, Mississippi.

Insufficient data is given with regard to sedimentation traps to evaluate their effectiveness in elimination of sediments and pollutants. Retention time should be given for 1, 5, 10 year and larger storm frequencies so that their effectiveness can be evaluated. Many pollutants are attached to fine silt particles with one or more days settling time, but if the sediment traps catch only the larger particles, most of the attached pollutants will continue down stream, placing a greater load on the down stream areas. Dissolved nutrients and minerals will not be caught in the sediment traps in any event.

It should be pointed out that a channelized stream has less assimilative capacity and offers little in the way of purification, except that some of the coarser materials are removed in the sediment traps and some reaeration will be provided in the channelized stream bed. Therefore, we question the statement in Chapter V (line 6) that "water quality in the lakes and streams will be improved." Under flood flows where the flood plain benefits are not or cannot be utilized because of the increased channel capacity, water quality will be degraded. There will be a permanent overall reduction in water quality in the stream due to channelization and this fact should be pointed out.

Based on our review, we have rated LO- (Lack of Objection) to the proposed project, and 2 (Insufficient Information) to the Impact Statement.

Please furnish us with five (5) copies of the Final Statement, and if we can be of further service, please let us know.

Sincerely,

David R. Hopkins
Chief, EIS Branch

STATE OF MISSISSIPPI
OFFICE OF THE GOVERNOR

WILLIAM L. WALLER
GOVERNOR

WM. M. HEADRICK
COORDINATOR OF FEDERAL-STATE PROGRAMS

STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

TO: Mr. W. L. Heard, State Conservationist
United States Department of Agriculture
Soil Conservation Service
Post Office Box 610
Jackson, Mississippi 39205

State Clearinghouse Number
75091005

Date: October 10, 1975

PROJECT DESCRIPTION: Watershed Work Plan and Draft Environmental Impact Statement for the Deer Credk Watershed, Mississippi.

(x) 1. The State Clearinghouse has received notification of intent to apply for Federal assistance as described above.

(--) 2. The State Clearinghouse has reviewed the application(s) for Federal assistance described above.

(--) 3. After proper notification, no State agency has expressed an interest in conferring with the applicant(s) or commenting on the proposed project.

(--) 4. The proposed project is: ( ) consistent ( ) inconsistent with an applicable State plan for Mississippi.

(x) 5. Although there is no applicable State plan for Mississippi, the proposed project appears to be: (x) consistent ( ) inconsistent with present State goals and policies.

COMMENTS: Enclosed are letters from the State Board of Water Commissioners, Mississipp State Highway Department and the Delta Council which are made a part of this clearinghou action.

This notice constitutes FINAL STATE CLEARINGHOUSE REVIEW AND COMMENT. The requirements of U.S. Office of Management and Budget Circular No. A-95 have been met at the State level.

Linda C. Ross
for Edward A. May, Jr.
Clearinghouse Director

State of Mississippi

BOARD OF WATER COMMISSIONERS
416 NORTH STATE STREET
JACKSON, MISSISSIPPI 39201
354-7236

October 9, 1975

Mr. Edward A. May, Jr.
Assistant to the Coordinator
Federal-State Programs
Suite 400, Watkins Building
Jackson, Mississippi 39205

Subject: Draft EIS and Watershed Work Plan for Deer Creek Watershed: Bolivar and Washington Counties, Mississippi
Clearinghouse No. 75091005

Dear Mr. May:

Enclosed herewith for A-95 clearance is the summary review of the above captioned EIS.

Yours very truly,

MISSISSIPPI BOARD OF WATER COMMISSIONERS

Jack W. Pepper

Jack W. Pepper
State Water Engineer

JWP:mm
Encl.

State of Mississippi

BOARD OF WATER COMMISSIONERS
416 NORTH STATE STREET
JACKSON, MISSISSIPPI 39201
354-7236

October 9, 1975

Mr. W. L. Heard
State Conservationist
U.S.D.A. Soil Conservation Service
P. O. Box 610
Jackson, Mississippi 39205

Subject: Draft Environmental Impact Statement and Watershed Work Plan for Deer Creek Watershed: Bolivar and Washington Counties, Mississippi

Dear Mr. Heard:

The above captioned Watershed Work Plan and EIS have been circulated among appropriate agencies of the State of Mississippi. Written responses are attached for your record.

No objections against the necessity or benefits of this plan were brought out in this review.

Sincerely,

MISSISSIPPI BOARD OF WATER COMMISSIONERS

Jack W. Pepper
State Water Engineer

JWP:mm
Encls.

MISSISSIPPI STATE HIGHWAY DEPARTMENT

P. O. Box 1850 Jackson, Mississippi 39205

September 16, 1975 Reply To

Mr. Larry J. Marble
Mississippi Board of
Water Commissioners
416 North State Street
Jackson, Mississippi 39201

Re: Draft Watershed Work Plan
Deer Creek Watershed
Bolivar and Washington Cos.

Dear Mr. Marble:

Reference is made to your letter of September 11, 1975 on the above subject.

We note that in paragraph three, page twenty seven, that a culvert must be replaced on Miss. State Highway No. 450. Even though the culvert is to be installed by others, a permit from the Mississippi State Highway Department must be obtained. This coordination should be handled through our Maintenance Division in Yazoo City, prior to commencing construction.

We also note that in paragraph two, page twenty eight, that a bridge on Miss. Highway No. 1 will have to be replaced. Coordination on this matter has already been accomplished by Soil Conservation and Highway Officials.

Very truly yours,

W K Magee

W. K. Magee
ENVIRONMENTAL DIVISION ENGINEER

WKM/jrh

DELTA Council

E ORGANIZATION OF THE YAZOO-MISSISSIPPI DELTA

OMOTING AND DEVELOPING THE ECONOMY AND SOCIETY OF ITS AREA

TELEPHONE: LELAND, MISS. 686-4041

STONEVILLE, MISSISSIPPI 38776

September 30, 1975

Mississippi Board of Water Commissioners
416 North State Street
Jackson, Mississippi 39201

Gentlemen:

We wish to acknowledge receipt of the Draft Watershed Work Plan, Deer Creek Watershed, Bolivar and Washington Counties, Mississippi, and Draft EIS for Deer Creek Watershed. We have reviewed the project plans with a great deal of interest and it appears to us that benefits far outweigh any adverse impacts. In fact, the plan has been modified in a number of its aspects to eliminate any possible adverse impact and fish and wildlife habitat within the watershed would be improved in many instances.

We, therefore, recommend that the project be approved and the work implemented as soon as possible.

Respectfully submitted,

B F Smith

B. F. Smith
Executive Vice President

BFS/dl

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, JACKSON, MISSISSIPPI

PROJECT MAP
DEER CREEK WATERSHED
BOLIVAR AND WASHINGTON COUNTIES
MISSISSIPPI

LEGEND

- State Highway
- Paved Road
- Secondary Road
- County Line
- City Limits
- Towns
- Railroad
- Drainage
- Levee
- Watershed Boundary
- Drainage District Boundary
- Pipeline
- Channel Enlargement
- Channel Clearing
- Sixteenth Section
- Flooding and Drainage Problems
- Flooding Problem

Approximate Scale

Transverse Mercator Projection compiled at 1:63,360 (1 inch equals 1 mile) and reproduced at 1:94,800 (1 inch equals 1.5 miles).

Base compiled from uncontrolled mosaic 4-R-29595, USGS Quadrangles and General Highway Maps.

JANUARY 1975 4-R-34548

JULY 1970 4-R-29596

USDA-SCS-FORT WORTH, TEX. 1975