ATTACHMENT 7G

ASSESSMENT OF IMPACTS AND EVALUATION OF DETAILED STRUCTURAL PLANS

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INTRODUCTION

GENERAL

1. This section contains information pertaining to the assessment, display, and accounting of economic, environmental, and social impacts of an implementable water resources improvement plan (recommended plan) for the Yazoo Backwater project area. The project area is located in northwest Mississippi and is located in or affects portions of six counties in the Yazoo River Basin of west-central Mississippi. These include Humphreys, Issaquena, Sharkey, Warren, Washington, and Yazoo Counties in Mississippi and a small portion of Madison Parish in Louisiana. Two of these counties (Issaquena and Sharkey) are totally encompassed by the project study area. The Big and Little Sunflower Rivers, Deer Creek, and Steele Bayou are the major streams in the Yazoo Backwater project area. Information presented describes and assesses the beneficial and adverse impacts from implementation of the recommended plan identified for various components of the human and natural environment pursuant to existing regulations and guidelines.

2. An impact assessment was conducted to identify and describe the economic, social, and environmental impacts expected from implementation of the recommended plan. Environmental features are included to enhance fish and wildlife resources. These evaluations form the basis for assessing the overall beneficial and adverse contributions of the project. The assessment and evaluation of plan impacts (economic, environmental, and social) are presented for the recommended plan. The difference in each pertinent parameter between the without- and with-project condition is the impact of the plan. Significance of impacts was determined when specific impact situations were considered crucial to decision making. Specific parameters (required by Section 122 of the 1970 River and Harbor and Flood Control Act, Public Law 91-611) were included and evaluated; other impacts were included if significant.

3. Display of the assessment of plan impacts is facilitated by the Systems of Accounts format. Four accounts, the NED, Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE), are used in organizing the information on impacts. These four accounts encompass all significant plan effects on the human environment as required by the National Environmental Policy Act (NEPA) of 1969 and on social well-being as required by Section 122 of the River and Harbor and Flood Control Act of 1970 (Public Law 91-611). These four accounts are also discussed in ER 1105-2-100, 22 April 2000, paragraphs 2-3 through 2-8. The NED account presents effects on the national economy by reflecting the monetary changes

in the net value of the national output of goods and services. The EQ account presents effects on ecological, cultural, and esthetic attributes of significant natural and cultural resources that are immeasurable in monetary terms. The RED account presents the regional incidence of NED effects, income transfers, employment, and other effects. The OSE account presents the urban and community impacts and effects on life, health, and safety. The Systems of Accounts format is integral to the planning process and provides information in trade-off analysis and decision making.

INCIDENCE OF PROJECT IMPACTS

4. The location, timing, and duration of each significant impact are also presented.

a. Location. Impacts are described to identify the geographic location of expected occurrence.

b. Timing. The timing of impacts is identified to establish their implementation.

c. Duration. The duration of impacts is identified to determine the extent and amount of any irreversible or irretrievable commitments of resources and their duration.

ACCOUNT VALUES

5. Systems of Accounts values for the various impact parameters are presented in monetary terms where possible; otherwise, quantitative units or qualitative terms are used. Monetary values in the accounts were converted to annual amounts by applying standard discounting procedures.

ALTERNATIVE CANDIDATE PLANS (BASE NED PLAN AND RECOMMENDED PLAN)

Base NED Plan

6. The NED plan (Base NED plan) is the plan which provides the maximum amount of net benefits (excess benefits over costs). In the economic analyses conducted for the detailed alternative structural plans, Alternative Plan 4 is the plan which provides the greatest amount of net benefits. Additional information concerning the base NED plan is contained in Appendix 7, Economic Analysis.

Recommended Plan

7. The recommended plan consists of a 14,000-cubic-foot-per-second (cfs) pumping plant with an 87-foot, National Geodetic Vertical Datum (NGVD), operating elevation and nonstructural flood control below 87 feet, NGVD. Additional information concerning the recommended plan is presented in Appendix 7 (Economic Analysis) and in the Main Report.

DETAILED ALTERNATIVE STRUCTURAL PLANS

8. Various detailed alternative structural, nonstructural, and combination structural/ nonstructural alternative flood control plans considered or evaluated for the Yazoo Backwater project area are discussed in the Main Report.

9. Nine detailed alternative structural, nonstructural, and combination structural/nonstructural plans were evaluated in the Economic Analysis, Appendix 7, of this report. With the selection of a recommended plan, this plan was utilized to provide the refined costs/benefits presented as the recommended plan.

10. Implementation of the recommended plan for the Yazoo Backwater project area will involve a 14,000-cfs pumping plant with an 87-foot, NGVD, operation, and nonstructural flood control below 87 feet, NGVD. Project implementation/construction will require the acquisition by easement of 55,600 acres below the elevation of 87 feet, NGVD. These easements will be acquired from willing sellers. No structural flood control will be provided below the elevation of 87 feet, NGVD. Lands below the elevation of 87 feet, NGVD, will be protected through the reestablishment of wooded lands which are more compatible to the frequent flooding that occurs at these lower elevations.

11. Implementation of the recommended plan in the Yazoo Backwater project area will require the acquisition from willing sellers of easements on 55,600 acres of agricultural cropland. Reestablishment of wooded lands on these open croplands will provide enhancement to the project area environment. All of the easement lands will be taken out of crop production and will be reforested with bottom-land hardwoods to create wildlife habitat.

CONSTRUCTION PROCEDURE AND PROJECT OPERATION AND MAINTENANCE, RECOMMENDED PLAN

Construction

12. Construction of the recommended plan is estimated to require 4 years (2008-2011). Approximately 20 percent of the total construction costs, including costs for easement acquisition and other associated costs for nonstructural features, would be expended the first year, 14 percent the second year, 29 percent the third year, and 37 percent the fourth year.

13. Implementation of the recommended plan in the Yazoo Backwater project area will consist of two primary features: (1) 14,000-cfs pumping plant and (2) nonstructural flood control below 87 feet, NGVD, by reestablishment of hardwood forests on open cropland.

Project Operation and Maintenance

14. The U.S. Army Corps of Engineers, Vicksburg District, is responsible for 100 percent of the operation and maintenance of the Yazoo Backwater project. Structure maintenance was estimated on all structures annually with no major replacement necessary for the life of the project.

IMPACT ASSESSMENT PROCEDURE

GENERAL

15. Installation of the recommended plan in the Yazoo Backwater project area will impact the economic, environmental, and social structure of the economic base study area. This section of the Impact Assessment and Systems of Accounts presentation addresses potential impacts to these parameters from construction and operation of the recommended plan for the project area. The project impacts will change between the construction and postconstruction periods; some impacts will be temporary, while others will have lasting impacts. Project impacts would also be realized in the remainder of the nation.

16. Project impacts and other useful information in decision making are presented in the Main Report and discussed in the Systems of Accounts of this appendix. The Main Report presents a summary of critical and determinative information useful in the plan selection/decision-making process. This appendix provides detailed information highlighting assessed impacts and

displaying the beneficial and adverse impacts of the recommended plan in terms of NED, EQ, RED, and OSE account contributions. Throughout the discussion and presentation, the following definitions apply:

a. Project area. Includes construction sites and lands within the identified area impacted by the Yazoo Backwater project (i.e., the area subject to flooding by a 100-year frequency flood event).

b. Study area/economic base area. Includes Humphreys, Issaquena, Sharkey, Warren, Washington, and Yazoo Counties, Mississippi, except where noted (Plate 4-1).

c. Rest of nation. Area of the United States, excluding the study area.

d. Parameter. A component of man's environment which, when changed, directly contributes to or detracts from the accomplishment of a planning objective or quality of life.

ECONOMIC PARAMETERS

National Economic Development (NED)

17. NED concerns change in the national output, an output partly reflected in a national product and income accounting framework designed to measure the flow of goods and services in the economy. The component parts of NED evaluated are the value to users of outputs of goods and services (benefits) and the value of resources required (costs) for a plan. The economic costs and benefits, expressed in terms of NED, and efficiency, expressed in terms of net benefits, are used as the standard of evaluation. Based on data developed during the economic analysis, the beneficial and adverse impacts associated with NED will be distributed throughout the project area, study area, and the rest of the nation, as presented in the Systems of Accounts table of this appendix.

18. Total NED benefits of the recommended plan are estimated to be $21,423,000 annually for the recommended plan (excludes employment benefits) at the current fiscal year 2005 Federal discount rate of 5-1/8 percent. Employment benefits ($1,088,000 annually) will accrue to the study area from project construction due to the creation of jobs and income flows and reduction of unemployment and underemployment in the construction industry. This can also contribute to increased incomes of persons in associated industries.

19. Total costs ($15,051,000 annually) include the value of resources required for project construction and operation and maintenance. Annual project costs were assessed to the rest of the nation in accordance with annual project costs designated as Federal costs and are presented in the Systems of Accounts.

Regional Economic Development (RED)

20. Income. Income impacts can be derived by summarizing the various NED benefits. In addition to the induced regional impacts, study area personal incomes would be increased by expenditures made by construction forces and subsequent second and third round expenditures. Area income and employment would be stimulated from project construction. For example, there would be increased demand for inputs used in construction; increased demands for food, clothing, and shelter induced by the influx of construction labor; and increased purchasing power of any locally hired labor. Money expended for wages and salaries has the impact of being spent several times in the local economy (the multiplier effect).

21. Employment/Labor Force.

a. Construction of the recommended plan would require an estimated 1,000 construction workers, consisting of an estimated 60 percent skilled, 30 percent semiskilled, and approximately 10 percent supervisory and administrative personnel. Project construction and operation and maintenance of the completed project are expected to have limited impact on employment in the study area as effects will be temporary, occurring only during the 4-year construction period.

b. Some related impacts to area employment from project construction will also occur. Temporary impacts in employment in various area industries/firms can be expected during project construction.

22. Business and Industrial Activity. Existing business and industrial activity within the study area economy will be stimulated during project construction; increases will be temporary.

23. Local Government Finances. Public revenues and expenditures could be significantly affected by implementation of a flood control project. These effects would be reflected by decreases in property taxes collected by the counties under current conditions. As lands are converted from agricultural lands to wooded lands, property taxes are reduced. Legislation is pending at the state level that could offset these potential losses to the counties. These reductions, if not recovered by some other means, could cause reductions in local government incomes and expenditures.

a. Tax revenues/rates. Project implementation could result in decreases in tax revenues through taxation of property with decreased value since the lands would convert from crop to woods. This change in use would have the effect of reducing taxes due on the lands converted to woods. Any increased taxes levied against area residents/landowners would be viewed adversely in terms of general public attitude.

b. Public facilities/services. Project impacts on existing public services and facilities in most of the four built-up areas within the Yazoo Backwater project area are expected to be negligible, since the influx of construction employees will be concentrated at the site of the pump

construction. Requirements for services and facilities such as utilities, telephones, schools, etc., can be provided by the local area for base (without-project) conditions. Services presently provided by utility and local governmental organizations should be adequate in both quantity and quality.

24. Property Values. Project implementation is expected to create beneficial impacts on property values in the protected flood plain.

25. Regional Growth (Desirable). Desirable regional growth refers to the rates of economic and population growth of a region that are consistent with publicly defined objectives. Throughout the Yazoo Backwater project area, publicly defined objectives, explicit or implied, include economic growth.

26. Displacement of Farms. Implementation of the recommended plan will not result in displacement of farms in the project area. It is expected that impacted owners have sufficient acreage in their farms such that land requirements of project construction and reforestation would not adversely impact the overall/total farming operations. Implementation of the recommended plan will necessitate acquisition of easements on 55,600 cropland acres from willing project area landowners. Easements for cropland acres to be protected by nonstructural measures will be acquired from willing sellers. A total of 55,600 acres of cropland will be removed from crop production and will be reforested with bottom-land hardwoods for wildlife habitat and timber production.

ENVIRONMENTAL PARAMETERS

Environmental Quality (EQ)

27. Natural Resources. Natural resources affected by implementation of the recommended plan would include land areas, water areas, and streams of the project area and associated fish, wildlife, waterfowl resources, and mineral resources. These areas provide recreational, water quality, esthetic, wildlife, and intrinsic benefits to the human environment. Specific significant resources include prime farmlands, waterfowl, bottom-land hardwoods, wetlands, threatened and endangered species, and cultural resources. Principal mineral resources in the Yazoo Backwater project area include sand, gravel, and clay. Sand and gravel resources, which are numerous and widespread through the area, are the most important mineral resources in the area. They are utilized in the construction industry as well as in the glass production and molding industries. Clays, used in making bricks, are also an important area resource. Fifty-four percent of the Yazoo Backwater project area lands are dedicated to agriculture.

a. Land resources. No additional acreage is required for actual construction of the recommended pumping plant. The reforestation portion of the plan will require easements on 55,600 acres of cleared lands. Converting existing crop land use to bottom-land hardwoods will

provide significant beneficial impacts to area wildlife resources, since existing bottom-land hardwoods in the area are limited. These lands will be retained in bottom-land hardwoods in perpetuity. Beneficial and adverse impacts on easement areas are monetized and displayed in the NED account.

b. Wetland resources. In addition to their very important wildlife value, project area wetlands provide floodflow alteration, sediment and toxicant retention, nutrient removal, and transformation, sediment stabilization, and production export (reference Appendix 10). Hydric soils were used to delineate agricultural (identified by NRCS as farmed wetlands or prior converted wetlands) and bottom-land hardwood wetlands (reference Appendixes 7 and 12). NRCS-identified farmed wetlands and prior-converted cropland are lands cropped before 23 December 1985. Farmed wetlands currently possess wetland functions and experience at least 15 consecutive days of growing-season inundation unlike prior-converted wetlands. Accordingly, prior-converted croplands are not regulated by Section 404 of the Clean Water Act. Agricultural and bottom-land hardwood wetlands total 189,600 (Table 7G-1 and reference Appendix 10). Bottom-land hardwoods account for 71 percent and farmed wetlands 29 percent of these existing wetlands. Extensive farm drainage systems and the lack of frictional resistance on farmed wetlands create a lower probability of performing wetland functions than bottom-land hardwoods. With implementation of the recommended plan, there would be a 19.3 percent gain in functional wetland value.

c. Water resources. Many of the existing stream habitats have been altered and have poor water quality. Construction of the recommended plan will result in temporary adverse impacts (increased sedimentation/turbidity) on existing aquatic habitat in streams in the project area. Reforestation of 55,600 acres of agricultural land will improve water quality over time.

(1) The Yazoo River system is one of the few remaining large tributaries of the lower Mississippi River without manmade barriers to fish movement. However, previous channel modification has straightened and smoothed sides and bottoms; removed sediment-trapping snags, vegetation, and debris; provided auxiliary channels; and cutoff meander loops. The Yazoo and other rivers in the area are turbid and meandering with deep, swift channels and slack-water areas associated with sandbars and cutbanks.

(2) A diversity of flood plain features provides an array of fisheries spawning and rearing habitats. Approximately 128,000 acres of 2-year average seasonal flooded acres exist under current conditions. Agricultural and fallow land dominate flood plain habitat, accounting for 41.7 percent of the total areas. Other features include natural levees, scatters and brakes, oxbow lakes, point bar ridges and swales, bottom-land hardwoods, manmade water bodies, weirs, and tributaries.

TABLE 7G-1
COMPARATIVE IMPACTS OF ALTERNATIVES a/
YAZOO BACKWATER PROJECT (RECOMMENDED PLAN IS PLAN 5)

Alternative	Terrestrial Resources b/	Aquatic Resources c/	Wetland Resources d/	Waterfowl Habitat e/	Water Quality	Endangered Species
No Action Plan 1	Existing conditions will continue. 241,800 acres of bottom-land hardwood habitat.	Existing conditions will continue. 128,000 acres of 2-year flood plain	Existing conditions will continue. 189,600 acres of 5 percent duration wetlands.	Existing conditions will continue. 13,333 acres of waterfowl foraging habitat.	Existing conditions will continue. No direct impacts. Degraded water quality would continue.	Not applicable
Plan 2	25.2 percent increase in terrestrial habitat. Net gain of 174,658 AAHUs. Reforestation of 124,400 acres of frequently flooded agricultural land.	98.4 percent increase in spawning habitat value. Net gain of 16,684 AAHUs. Reforestation of 124,400 acres of frequently flooded land.	46.8 percent increase in wetland functional value or 418,291 FCUs. Reforestation of 124,400 acres of frequently flooded land.	21.1 percent decrease in waterfowl DUDs or 389,597 DUDs. Reforestation of 124,400 acres of frequently flooded agricultural land.	Conditions should improve with the reforestation of 124,400 acres of agricultural land.	Reforestation of 107,000 acres will provide additional habitat for the endangered pondberry plant (*Lindera melissifolia)* and the threatened Louisiana black bear(*Ursus americanus luteolus*)
Plan 2A	16.5 percent increase in terrestrial habitat. Net gain of 114,286 AAHUs. Reforestation of 81,400 acres of frequently flooded agricultural land.	64.4 percent increase in spawning habitat value. Net gain of 10,917 AAHUs. Reforestation of 81,400 acres of frequently flooded agricultural land.	30.6 percent increase in wetland functional value or 273,704 FCUs. Reforestation of 81,400 acres of frequently flooded land.	27.9 percent decrease in waterfowl DUDs or 516,978 DUDs. Reforestation of 81,400 acres of frequently flooded agricultural land.	Conditions should improve with the reforestation of 81,400 acres of agricultural land.	Reforestation of 77,300 acres will provide additional habitat for pondberry and the Louisiana black bear.
Plan 2B	4.8 percent increase in terrestrial habitat. Net gain of 33,052 AAHUs. Reforestation of 26,400 acres of frequently flooded agricultural land.	19.8 percent decrease in spawning habitat value. Net loss of 3,350 AAHUs. Reforestation of 26,400 acres of frequently flooded agricultural land.	43.0 percent increase in wetland functional value or 384,666 FCUs. Reforestation of 26,400 acres of frequently flooded land.	53.2 percent decrease in waterfowl DUDs or 984,466 DUDs. Reforestation of 26,400 acres of frequently flooded land.	Conditions should improve with the reforestation of 26,400 acres of agricultural land.	Reforestation of 107,000 acres will provide additional habitat for pondberry and the Louisiana black bear.
Plan 2C	23.2 percent increase in terrestrial habitat. Net gain of 160,618 AAHUs. Reforestation of 114,400 acres of frequently flooded agricultural land.	90.5 percent increase in spawning habitat value. Net gain of 15,343 AAHUs. Reforestation of 114,400 acres of frequently flooded land.	43.0 percent increase in wetland functional value, or 384,666 FCUs. Reforestation of 114,400 acres of frequently flooded land.	27.9 percent decrease in waterfowl DUDs or 516,978 DUDs. Reforestation of 114,400 acres of frequently flooded land.	Conditions should improve with the reforestation of 114,400 acres.	Reforestation of 88,000 acres will provide additional habitat for pondberry and the Louisiana black bear.

TABLE 7G-1 (Cont)

Alternative	Terrestrial Resources b/	Aquatic Resources c/	Wetland Resources d/	Waterfowl Habitat e/	Water Quality	Endangered Species
Plan 3	Slight decrease in AAHUs due to conversion effect. 38 acres of bottom-land hardwoods converted or a loss of 113 AAHUs. Requires compensatory mitigation of 79 acres of frequently flooded agricultural lands.	46.1 percent decrease in spawning habitat value. Net loss of 7,818 AAHUs. 38 acres of bottom-land hardwoods converted or a loss of 27 AAHUs. Requires compensatory mitigation of 52,283 acres of frequently flooded agricultural land.	4.9 percent overall decrease in wetland functional values or 43,590 FCUs. 38 acres of bottom-land hardwoods converted or a loss of 240 FCUs.	1.3 percent decrease in waterfowl foraging habitat or 23,983 DUDs. 38 acres of bottom-land hardwoods lost directly or 2,166 DUDs. Requires compensatory mitigation of 11.1 acres of frequently flooded land.	Construction of structural features will cause a short-term increase in turbidity. Reforestation of 52,283 acres of agricultural land will improve water quality over time.	An on-ground survey and biological assessment for *Lindera melissifolia* and *Ursus americanus luteolus* were complete. No colonies of pondberry were found in rights-of-way and no signs of Louisiana black bear were found. Biological assessment concludes that the project is not likely to adversely affect either species. No indirect or hydrologic impacts on either species. Reforestation of 52,283 acres will provide additional habitat.
Plan 4	7.6 acres of bottom-land hardwoods converted or a loss of 113 AAHUs Reforestation of 37,200 acres of bottom-land hardwoods. Overall gain of 52,355 AAHUs.	5.4 percent overall increase in spawning habitat value, or 9,136 AAHUs. 38 acres of bottom-land hardwoods converted, or 27 AAHUs. Reforestation of 37,200 acres of bottom-land hardwoods.	10.9 percent increase in wetland functional value or 97,262 FCUs. 38 acres of bottom-land hardwoods converted or 240 FCUs. Reforestation of 37,200 acres of bottom-land hardwoods. Overall gain of 123,398 DUDs.	26.5 percent overall increase in waterfowl foraging habitat value or 489,407 DUDs. 38 acres of bottom-land hardwoods converted or 2,166 DUDs. Reforestation of 37,200 acres of bottom-land hardwoods.	Construction of structural features will cause a short-term increase in turbidity. Reforestation of 37,200 acres of agricultural land will improve water quality over time.	Same as Alternative 3 except reforestation of 37,200 acres will provide additional habitat.

TABLE 7G-1 (Cont)

Alternative	Terrestrial Resources b/	Aquatic Resources c/	Wetland Resources d/	Waterfowl Habitat e/	Water Quality	Endangered Species
Plan 5	11.3 percent overall increase in terrestrial resource value or 78,188 AAHUs. 38 acres of bottom-land hardwoods converted or a loss of 113 AAHUs. Reforestation of 55,600 acres of bottom-land hardwoods.	34.5 percent overall increase in flood plain spawning habitat value or 5,850 AAHUs. 38 acres of bottom-land hardwoods converted or a loss of 27 AAHUs. Reforestation of 55,600 acres of bottom-land hardwoods.	19.3 percent overall increase in wetland functional value, or 172,802 FCUs. 38 acres of bottom-land hardwoods converted or 240 FCUs. Reforestation of 55,600 acres of bottom-land hardwoods.	52.8 percent overall increase in waterfowl foraging habitat value or 977,406 DUDs. 38 acres of bottom-land hardwoods converted or 2,166 DUDs. Reforestation of 55,600 acres of bottom-land hardwoods.	Construction of structural features will cause a short-term increase in turbidity. Reforestation of 55,600 acres of agricultural land will improve water quality over time.	Same as Alternative 3 except reforestation of 55,600 acres will provide additional habitat.
Plan 6	16.5 percent increase in terrestrial resource value or 114,534 AAHUs. 38 acres of bottom-land hardwoods converted or a loss of 113 AAHUs. Reforestation of 77,300 acres of bottom-land hardwoods.	64.2 percent overall increase in flood plain spawning habitat or 10,891 AAHUs. 38 acres of bottom-land hardwoods converted or a loss of 27 AAHUs. Reforestation of 77,300 acres of bottom-land hardwoods. Overall gain of 11,241 AAHUs.	29.6 percent overall increase in wetland functional value, or 264,331 FCUs. 38 acres of bottom-land hardwoods converted, or a loss of 240 FCUs. Reforestation of 81,400 acres of bottom-land hardwoods.	94.8 percent overall increase in waterfowl foraging habitat value or 1,754,222 DUDs. 38 acres of bottom-land hardwoods converted or 2,166 DUDs. Reforestation of 81,400 acres of bottom-land hardwoods.	Construction of structural features will cause a short-term increase in turbidity. Reforestation of 81,400 acres of agricultural land will improve water quality over time.	Same as alternative 3, except reforestation of 81,400 acres will provide additional habitat.
Plan 7	25.2 percent overall increase in terrestrial resource value or 174,906 AAHUs. 38 acres of bottom-land hardwoods converted, or a loss of 113 AAHUs. Reforestation of 124,400 acres of bottom-land hardwoods.	106.2 percent overall increase in floodplain spawning habitat, or 18,010. 38 acres of bottom-land hardwoods converted or a loss of 27 AAHUs. Reforestation of 124,400 acres of bottomland hardwoods.	46.3 percent overall increase in wetland functional value, or 414,152 FCUs. 38 acres of bottom-land hardwoods converted or a loss of 240 FCUs. Reforestation of 124,400 FCUs.	153.9 percent overall increase in waterfowl foraging habitat value or 2,846,517 DUDs. 38 acres of bottom-land hardwoods converted or a loss of 2,166 DUDs. Reforestation of 107,000 acres of bottom-land hardwoods.	Construction of structural features will cause a short-term increase in turbidity. Reforestation of 124,400 acres of agricultural land will improve water quality over time.	Same as Alternative 3 except reforestation of 124,400 acres will provide additional habitat.

NOTE: For detailed information on aquatic, waterfowl, terrestrial, and wetland resources; water quality; and endangered species, see Appendixes 1, 10-14, and 16.

a/ Terrestrial, aquatic, wetland, waterfowl ,water quality, and endangered species impacts apply only to the reformulated portion of the Yazoo Backwater project area. Impacts from the completed and reformulated portions of the Yazoo backwater area are given in Appendix 1.

b/ AAHU=average annual habitat units.

c/ AAHU=average annual habitat units.

d/ FCU=functional capacity units.

e/ DUD=duck-use days. Although reforestation results in a loss of waterfowl foraging habitat by all plans, there are other important waterfowl habitat requirements that are met with reforestation (loafing, pair bonding, shelter, etc.) and that are notably absent in agricultural fields. According to FWS, the overall benefit that results from reforestation far exceeds losses of foraging habitat.

d. Mineral resources. The mineral resources (sand, gravel, clay, etc.) or the extraction processing industries of these resources located within the Yazoo Backwater impacted area would receive no adverse impacts from implementation of the recommended flood control project.

e. Fish and wildlife resources.

(1) Terrestrial resources. Terrestrial wildlife habitats range from open, agricultural monocultures to diverse and productive bottom-land hardwoods. Agricultural fields and edges between bottom-land hardwoods and agricultural fields provide habitat for some species. However, 233,869 acres of bottom-land hardwoods provide the highest quality and most stable habitat. The U.S. Fish and Wildlife Service classifies bottom-land hardwood as Resource Category 2; i.e., habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section. Terrestrial wildlife species present in the project area and associated with bottom-land hardwoods include white-tailed deer, raccoon, cottontail and swamp rabbits, squirrels, field mice, mink, etc., and birds such as wood duck, wild turkey, owls, woodpeckers, various song birds, etc. Habitat Evaluation Procedures quantified bottom-land hardwood and cypress habitat for terrestrial species (Table 7G-1 and Appendix 10). With implementation of the recommended plan, terrestrial habitat would incur a net gain of 11.3 percent in average annual habitat units.

(2) Waterfowl resources. There are 13,332.7 acres of average seasonal habitat available currently. With implementation of the recommended plan, a 52.8 percent gain of waterfowl foraging habitat would occur.

(3) Fishery resources. There are 128,000 acres of 2-year average seasonal flooded acres available under existing conditions. With implementation of the recommended plan, flood plain spawning habitat would increase by 34.5 percent.

28. Sociocultural Elements. Implementation of the recommended plan will have the beneficial impact of converting approximately 55,600 acres of the project area to bottom-land hardwoods. However, some residents may view the loss of agricultural cropland as an adverse impact to the area.

29. Environmental Analysis. Environmental impacts of this project were analyzed using a habitat unit analysis for terrestrial and aquatic resources only. Waterfowl impacts were based on a duck-day analysis, and wetland analysis was based on qualitative functional acreage-based analysis. These impacts are presented in Table 7G-1 and Appendix 10.

SOCIAL PARAMETERS

Other Social Effects (OSE)

30. Community Cohesion. Community cohesion will be strengthened from construction of the recommended plan due to the alleviations/reductions of flood damages and threat of flooding. No adverse impacts on community cohesion are anticipated.

31. Community Growth. Community growth is usually interpreted in terms of an increasing population with corresponding increases in community services and a healthy area economy. Favorable impacts on community growth would be expected to occur during actual construction of the recommended plan and would be evident throughout the project life as additional income is generated by the expected higher crops yields and net returns. There would be some initial reduction in area income as lands are converted from crops to woodlands; however, this loss would be offset by gains in area recreational opportunities and returns to timber production. Favorable impacts during this period will generally be short term. The project is not expected to result in any significant long-term community growth.

32. Population Growth. Installation of the recommended plan is not expected to have any significant impact on study area population trends. During project construction, the population of the project area will increase slightly due to influx of construction workers. This influx of workers will be short term, however, and is not expected to have measurable impacts on the population growth, density, or migration patterns of the area in the postconstruction period.

33. Noise. Noise created by project construction will be a nuisance, with the project area absorbing the impact of these noises. However, since most of the construction in the project area is not adjacent to a populated area, adverse impacts from noise will be minimal.

34. Displacement of People. Installation of the recommended plan will not displace any families in the Yazoo Backwater (impacted) area.

35. Esthetic Values. The conversion of 55,600 acres of agricultural cropland in the project area to bottom-land hardwoods by the installation of the recommended plan will provide beneficial impacts to the esthetic values of these areas. Land disturbance during project construction will create unsightly conditions that will be remedied as construction is completed and vegetation recovers.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

36. Installation of the recommended plan of improvement in the project area will result in the irretrievable and irreversible commitment of land resources for the entire project life. Lands required for project construction will be removed from existing use while potential alternative uses will be precluded. Implementation of project features will irreversibly and irretrievably commit the labor and materials associated with construction activities. Planning and technical expertise, as well as monetary resources, will be irretrievably committed to the Yazoo Backwater project.

SYSTEMS OF ACCOUNTS

37. Beneficial and adverse contributions identified in each of the four accounts are summarized in the following paragraphs and displayed in the Main Report and Table 7G-2 of this appendix.

a. NED. Beneficial contributions to the NED account consist of flood control benefits and employment benefits. Adverse contributions to the NED account include the value of resources for project construction and project operation and maintenance. Net national economic benefits are estimated at $7,460,000 (including employment) annually for the recommended plan (Table 7G-2).

b. EQ. The recommended plan will decrease waterfowl foraging habitat through reduction of winter-foraging areas. Parameters receiving positive adverse impacts include esthetics, terrestrial resources, aquatic resources, wetlands, and water quality. Approximately 55,600 acres of agricultural cropland in the project area would be converted to bottom-land hardwoods with installation of the recommended plan. Insignificant temporary adverse impacts on water quality will be incurred during project construction. Beneficial and adverse impacts for the EQ account are presented in Table 7G-2.

c. RED. Parameters for income, employment, "desirable" regional growth, and business and industrial activity are expected to benefit from project installation. No impacts were determined to be significantly adverse to regional development. Beneficial impacts to RED would result from increased income and employment associated with construction of the recommended plan. The estimated net annual benefits accruing from installation of the recommended plan are $7,460,000 (including employment) (Table 7G-2).

d. OSE. Beneficial contributions to the OSE account are reflected in community cohesion and community growth parameters (Table 7G-2). Community cohesion is expected to be strengthened by the reduction of flood damages and the reduced threat of flooding in the project area.

TABLE 7C-2
PROJECT ECONOMIC, ENVIRONMENTAL, SOCIAL, AND OTHER IMPACTS DISPLAY
BY SYSTEMS OF ACCOUNTS (NED, EQ, RED, OSE)
RECOMMENDED PLAN (ALTERNATIVE 5)
YAZOO BACKWATER AREA, MISSISSIPPI
(6-5/8 Percent Discount Rate)

Account/Parameter	Location of Impact	Type Impacts		Total (Net National Impact)
		Beneficial	Adverse	
1. NATIONAL ECONOMIC DEVELOPMENT (NED)				
a. Annual Benefits ($000):				
Flood Control 6/9/12/ 13/	Project Area	17,918	0	17,918
Employment 3/9/12/	Study Area	506	0	506
Total NED Benefits		18,424		18,424
b. Annual Costs ($000):				
Project Construction 3/6/9/12/				
Federal	Rest of Nation	0	14,727	14,727
Operation Rehabilitation 3/5/9/12/				
Federal	Rest of Nation	0	154	154
Total NED Costs			14,881	14,881
c. Net NED Benefits/Costs ($000):		3,543	0	3,543 1/
d. Benefit-Cost Ratio		1.24	--	1.24
2. ENVIRONMENTAL QUALITY (EQ)				
a. Environmental Quality Enhanced/Preserved/ Protected:				
* Natural resources 3/9/12/	Project Area	Conversion of 62,500 acres of agricultural cropland in the Yazoo Backwater area hardwoods.	None.	

TABLE 7C-2 (Cont)

Account/Parameter	Location of Impact	Type Impacts		Total (Net National Impact)
		Beneficial	Adverse	
b. Environmental Quality Degraded: (1)* Air 3/6/9/12/13/	Project Area	--	Project construction will add to residues in atmosphere from open-air burning, dust, and from operation of internal combustion engines.	Short-term degradation of air quality in the area.
	Study Area	--	Insignificant	No Significant impact.
(2)* Water/water quality 3/6/9/12/	Project Area/ Study Area (Flood Plain)	--	Adverse impact on water quality and aquatic habitat (ecosystem) in streams from project construction. Increased turbidity during construction will be temporary.	Adverse impact on water quality and aquatic habitat in area streams.
c. Environmental Quality Destroyed: (1)* Natural resources 3/9/12/	Project Area	--		
(2)* Manmade resources 3/9/12/	Project Area			
3. REGIONAL ECONOMIC DEVELOPMENT (RED) a. Income: (1) Summary, annual benefits ($000) Flood control 6/9/13/	Project Area	17,918	0	17,918
Employment 6/9/13/	Study Area	506	0	506
Regional Economic Development Indirect personal income increases with project construction ($000) 6/9/10/13/	Study Area	0	0	0
Total Benefits		18,424		18,424
(2) Excess Benefits Over Cost ($000)		3,543		3,543 2/
(3) Benefit-Cost Ratio		1.24		1.24

TABLE 7C-2 (Cont)

Account/Parameter	Location of Impact	Type Impacts		Total (Net National Impact)
		Beneficial	Adverse	
b. Employment/Labor Force: * (1) Project construction 3/9/11/12/	Project Area	The total number of jobs created over the 3-year construction period is estimated at _____. Classification by skill level consists of ___ percent skilled, ___ percent semiskilled, ___ percent unskilled, ___ percent supervisory and administrative. Locally hired workers, actively participating in project construction are estimated to number ___ in the first year of construction, ___ for the second year, ____for the third year. Temporary impact.		Negligible.
	Study Area	Negligible, temporary.	--	Negligible.
(2) Project operation and maintenance 6/9/12/	Project Area	Negligible.	--	Negligible.
(3) Indirectly induced jobs 3/8/12/	Study Area	Negligible.	--	Negligible.
(4) Other regional employment impacts 3/6/8/13/		Insignificant.	--	Insignificant.
c. Business and Industrial Activity: 5/8/12/	Project Area	Temporary increase in activity.	--	Activity will increase temporarily.
	Study Area	Temporary stimulation of existing business and industrial activity by income increases, employment opportunities, multiplier, impacts, etc.	--	Temporary stimulation of existing business and industrial activity. Net beneficial effect.
d. Tax Revenues: * 5/7/12/	Study Area	Minor decrease in tax revenues expected, resulting from conversion of cropland to woodland.	--	Minor decrease in tax revenues expected.
e. Property Values ($000): 6/9/11/12/	Project Area	Protected area land value will increase, particularly lands subject to being converted to nonagricultural use (residential, commercial, etc.).	--	Increase in value of flood-free lands.
f. Desirable Regional Growth: 5/9/12/	Project Area	Consistent with local and regional development plans	--	Compatible with local and regional planning.
	Study Area	--	--	--
	Rest of Nation	Insignificant.	--	Insignificant.
g. Local Government Finance: 5/9/12/	Study Area	--	--	--
h. Public Facilities: * 5/8/12/	Study Area	--	Negligible impact.	Negligible impact.
i. Public Services: * 5/8/12/	Study Area	--	Negligible impact.	Negligible impact.

TABLE 7C-2 (Cont)

Account/Parameter	Location of Impact	Type Impacts		Total (Net National Impact)
		Beneficial	Adverse	
j. Displacement of Farms/Ownerships: * 3/9/12/	Project Area	--	Potential for impacting farm property ownerships by acquisition requirements for project construction. Impacts on ownerships affected not expected to adversely impact existing farming operations of affected ownerships. 5/8/13/	Negligible.
k. Tax Rates: 6/8/12/	Project Area	--		
	Study Area	--		
4. OTHER SOCIAL EFFECTS (OSE) a. Community Cohesion: * 5/8/12/	Project Area	Strengthened due to reduced flood threat and reduced flood damages.	--	Should improve standard of living.
	Study Area	Strengthened due to reduced flood threat and reduced flood damages.	--	Should improve standard of living.
b. (Desirable) Community Growth: * 5/8/12/	Study Area	Temporary favorable impacts expected with project construction.	--	Insignificant.
c. Population Growth: 3/9/12/	Study Area	Insignificant.	--	Insignificant.
d. Noise: * 6/9/12/	Project Area	--	Increased noise levels during project construction. Negligible impact, most of construction not adjacent to populated area.	Increase in noise levels expected. Impact negligible.
e. Displacement of People: *	Project Area	--	No families would be displaced.	No displacement of families.
f. Esthetic Values: * 3/6/9/12/	Project Area	--		
	Study Area	--	Negligible.	Negligible.

TABLE 7C-2 (Cont)

Account/Parameter	Location of Impact	Type Impacts		Total (Net National Impact)
		Beneficial	Adverse	
g. Community Growth: 5/8/12/	Study Area	Project construction not expected to result in any real population increase. Some minor temporary increase during construction activity only.	--	Insignificant.

NOTE: Costs shown reflect October 1999 levels.
1/ Excludes redevelopment benefits.
2/ Excludes redevelopment benefits.

Timing:
3/ Impact is expected to occur prior to or during implementation of the plan.
4/ Impact is expected with 15 years following plan implementation.
5/ Impact is expected in a longer timeframe 15 or more years following implementation).
6/ Impact is expected over project life.

Uncertainty:
7/ The uncertainty associated with the impact is 50 percent or more.
8/ The uncertainty is between 10 and 50 percent.
9/ The uncertainty is less than 10 percent.

Exclusivity:
10/ Overlapping entry; fully monetized in NED account.
11/ Overlapping entry; not fully monetized in NED account.

Actuality:
12/ Impact will occur with implementation.
13/ Impact will occur when specific additional actions are carried out during implementation.
14/ Impact will occur because necessary additional actions are lacking.

CONCLUSIONS

38. Identification and evaluation of impacts resulting directly from or induced by installation of the recommended plan yielded the following conclusions.

a. The recommended plan (Alternative Plan 5) would satisfy local needs for provision of flood protection for the four built-up urban areas and adjacent agricultural sectors of the project area.

b. The plan would provide beneficial contributions to NED. In addition, the plan would provide beneficial contributions to RED, OSE, and EQ.

c. The plan would create beneficial impacts on environmental quality due to the increase, alteration, or conversion of cropland to woodlands. Beneficial impacts will occur from construction of the recommended plan to terrestrial, wetland, and aquatic resources (private lands). Beneficial impacts will accrue to fish and wildlife through acquisition of easements from willing sellers for conversion of 55,600 acres of agricultural cropland to bottom-land hardwoods in the project area.

d. The recommended plan would be consistent with local and regional land use and development plans.